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LEARNING ENVIRONMENTS ONLINE: A CASE STUDY OF ACTUAL PRACTICE

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A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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June, 1997
Abstract

This research is an ethnographic study of an online learning environment. Based on a review of literature and observations as a participant observer, theory was developed suggesting the need for schools to become organisations for learning, creating learning environments that promote innovative practice and knowledge-building for all (educators and students). It recognises that the environment in which learners work has a major impact on learning.

The theoretical position for this research is developed from an activity research base (Argyris, 1992; Crawford, 1995b; Greenfield, 1984; Lomax, 1989), recognising the need for learning to be situated within the context of an activity (Lave & Wenger, 1991; Leont’ev, 1981; Vygotsky, 1978) and sequenced to reflect an individual learner’s knowledge-building and meaning making (Scardamalia & Bereiter, 1994).

This research examines the external pressures, such as the organisational structure of the environment in which the learner works, and their affect on participation and knowledge-building (Argyris, 1993; Fullan, 1991; Scardamalia & Bereiter, 1994). Organisation learning (Argyris, 1992; Argyris & Schon, 1978; Chawla & Renesch, 1995; Kofman & Senge, 1993; Senge, 1990) and schools as knowledge-building communities (Brown, 1994; Scardamalia and Bereiter, 1994) are integral concepts of the theoretical orientation for this work, confirming the need for educational restructuring in order to develop learning environments promoting innovative practice.

Central to this research is the situation of learning in a virtual environment and the development of online communities of practice (Feenberg, 1995; Turkle, 1995). The research explores the actual practice the New Directions in Distance Learning program, located in British Columbia, and views it in terms of the potential promised in the research (Feenberg, 1995; Harasim, 1990; Hiltz, 1990a & b; Hiltz & Turoff, 1982) and the challenges of working with new technology.

Findings from the research suggest that the attributes required for learning environments which promote innovative practice and knowledge-building are consistent with the potential promised in computer supported environments. However, the actual practice of the NDDL project suggests that the constraints (traditional organisational structures) inherent in the learning environment affect learner performance (needs and goals) which are consistent with activity theory (Leont’ev, 1981; Vygotsky, 1978) and which impede knowledge-building activity. Also relevant is the importance of organisational learning and necessity of all members of an organisations to be actively part of continuous personal knowledge-building and contributors to the artefacts which form an organisation’s memory and culture.

The results of this research indicate the need for further study in software design, allowing for knowledge-building and creative activities.
ACKNOWLEDGMENTS

I want to thank all those people involved in the NDDL project who took the risks and engaged in innovative practice with the goal of making our education system better, especially David, Enid, John, and Sandra. Professionals such as these model excellence and lifelong learning and make me proud to be a teacher.

I also want to thank Dr. Kathryn Crawford for her guidance and assistance. Her timely suggestions of references and her constructive criticism were essential.

Thanks must also go to my dear friends, Ian and Ellen, whose support and continued faith made this process possible and kept me going.
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CHAPTER ONE
INTRODUCTION

Nothing is ever as simple as it seems.
- Common Knowledge

This research is about learning environments. Through the observation of one educational program, previous experience in the field, and a review of the literature, theory was developed suggesting attributes and characteristics necessary to develop environments promoting innovative practice and knowledge-building (Scardamalia & Bereiter, 1994). It recognises that the environment in which learners work has a direct impact on their learning.

Included in this research is a review of literature (Chapter Two) which situates this specific case study within the academic experience of prior research. Chapter Two is broken into three sections, each addressing specific questions which arose as the research progressed.

1. What is knowledge-building?
2. What are the characteristics of an environment that supports knowledge-building?
3. Can schools become environments promoting innovative practice and knowledge-building?
4. Do existing organisations within educational systems support knowledge-building?
5. Can online environments support knowledge-building?
6. Can those environments promote innovative practice and support knowledge-building?

Section A addresses questions one and two, recognising that in the real world, people learn continuously, whether it be golf tips from friends or gardening suggestions from magazines. This learning takes place in a variety of settings with assistance from a range of individuals and artefacts (tools, information, etc.); however, it is noticeable that the learning process appears to change in the formal environment of traditional schools. The distinction between school learning and learning situated in actual practice is central to the work of Lave and Wenger (1991), Rogoff (1990, 1994), and others.

The commonly expressed observation, if children learned to walk or talk in schools, a few might never learn, the majority would take years to master it, and some would have to be enrolled in special programs, suggests the problems inherent in school learning are publicly known. Researchers (Brown, 1994; Perkins, 1992; Scardamalia & Bereiter, 1994) note that the problems do not lie in a lack of knowledge about learning, but rather in a gap between research and the actual practice of teaching.
All suggest the necessity of major educational reform, developing intentional learning environments (Brown, 1994) in which learners are given opportunities to take charge of their own learning. Intentional learning allows learners to find relevance in learning, situating it in their specific needs. It develops a relationship between the learning and the learner (Cazden, 1988), recognising that learners must be active participants in the learning process or the process will not be valued.

Activity theory (Crawford, 1995a & b; Leont’ev, 1981; Vygotsky, 1978, 1981, 1986), informs intentional learning, suggesting that a learner’s needs must determine activities. These activities are subordinate to learner’s goals and, therefore, do not control the goals or the needs but support them. This is quite different from most western approaches to education where activities or events fill the curriculum, and goals are pre-determined as part of a national political and social agenda (Perkins, 1992; Welch, 1996; Wertsch. Minick, & Arns, 1984).

Vygotsky (1978, 1981, 1986) recognises the impact environment has on learning, suggesting institutions (conditions) and social interactions (socio-cultural influences) directly affect a learner’s needs and goals. This impact is often overlooked in schools where the actual term activity is synonymous with work sheets or other school based tasks which support the institution’s goals for learning.

Activity theory and intentional learning (Brown, 1994; Scardamalia & Bereiter, 1994) suggest that basing activity on learner needs and goals is critical to a learner’s ability to internalised information and build knowledge with it. The external conditions in which learners gain information and begin to make personal sense of it affects a learner’s ability to internalise it and engage in innovative practice. Nonaka and Takeuchi (1995) suggest internalising learning is a knowledge spiral; a concept similar to Newman, Griffith, and Cole’s (1989) cognitive construction zone or Scardamalia and Bereiter’s (1994) knowledge-building community. In the context of this research, knowledge-building is the discovery, construction, and interpretation of information. It requires active engagement in personally, relevant innovative practice.

Common to all these notions of external knowledge acquisition and internal knowledge-building is the need to recognise individual learner needs and goals and a respect of learner diversity. This is reflected in Vygotsky’s (1978) concept, zone of proximal development (ZPD), suggesting that learners be given assistance (scaffolding) from an expert or more experienced peer in order to accomplish tasks that are progressively more difficult than ones they are capable of accomplishing independently.

Incorporating the concept of ZPD into school practice will require a major restructuring of curriculum and assessment (Bereiter & Scardamalia, 1993; Brown, 1994). Progressive problem-solving (Scardamalia & Bereiter, 1994), similar to Vygotsky’s (1978) ZPD, cannot be done on mass with a pre-determined time line. The
scaffolding required for each learner will be different, and the time required to internalise the learning will vary.

Therefore, the incorporation of activity theory into the current educational environment will require a dramatic restructuring of schools. Teaching strategies will need to be revised, noting that a shift from distributing knowledge to guiding and modeling learning will require a shift in the current power relationship inherent in the direct instruction approach used in most schools.

All members (administrators, teachers, students) must be seen as learners; individuals engaged in the continuous process of learning, and schools must become organisations focused on learning.

Section B focuses on the issue of educational reform (Perkins, 1992; Welch, 1996; and others). Brown (1994) eloquently states that contemporary educational practice has not changed to reflect the understanding of knowledge-building produced by this century’s research. Formal education in schools is delivered much the same way it was at the turn of the century, ignoring the advances of research and the introduction of powerful tools such as computers, video, and television. It is a theory of this research that computer technology can be used as a powerful tool for the transition from traditional practice to a reformed, innovative restructuring of educational organisations.

Viewing schools as organisations is a shift in some contemporary thinking. Scardamalia and Bereiter’s (1994) work on schools as knowledge-building communities suggests a strong link with the research on learning organisations (Chawkla and Renesch, 1995; Kofman and Senge, 1993; Senge, 1990) and organisational learning (Argyris, 1992, 1993; Argyris & Schon, 1978). These connections allow for the development of a theoretical organisation for learning, suggesting characteristics that support innovative practice and knowledge-building (Section B).

This research explores those characteristics, determining attributes necessary for learning. Attributes include (1) personal mastery, (2) collaboration and social interaction, and (3) systems thinking, supporting a holistic understanding. A factor that appears to link these attributes into a continuous learning cycle is dialogue. Dialogue with peers and experts is supported by Vygotsky (1978, 1981, 1986) and Cazden (1988) and researchers advocating cognitive apprenticeship and a community of learners (Brown, 1994; Rogoff, 1990, 1994; and others).

The characteristics of this learning environment are consistent with the research in intentional learning (Bereiter & Scardamalia, 1993, 1989; Brown, 1994; Dewey, 1929; and others), cognitive apprenticeship (Brown, 1992; Rogoff, 1990), and activity theory (Crawford, 1995a & b ; Leont’ev, 1981; Vygotsky, 1978, 1981, 1986).
An organisation for learning is also consistent with the potential promised for computer supported learning environments, suggesting that organisations for learning could be situated online in computer conferences.

In constructing the theory of organisations for learning, this research referred to the contemporary literature on organisational learning to determine the critical factors in organisational structure and group interactions. Literature in this area informed this research in the strategies of double-loop learning (Argyris & Schon, 1978), systems thinking (Senge, 1990), and personal empowerment (Mink, Owens, & Mink, 1993).

Argyris and Schon (1978) identify double-loop learning as detecting and correcting errors in such a deep manner that the underlying norms and values of the organisation are modified. This differs from single-loop learning which is a more surface reaction to error. Argyris and Schon state that most schools are limited learning organisations. Schools are microcosms of society reflecting the fragmentation, competitiveness, and reactivity found in daily life (Kofman & Senge, 1993). Schools often do not engage in double loop learning strategies to address and solve problems, but instead utilise single loop responses to problems, often resulting in new problems arising from previous solutions (Argyris, 1993; Fullan, 1991). Argyris and Schon (1978) characterise limited learning organisations as those which do not learn from their members and therefore, limit their members’ ability to learn as well. Encouraging all members of an organisation to become learners is at the heart of Scardamalia and Bereiter’s (1994) knowledge-building community. It recognises that in today’s information rich society, individuals must learn where to find information and view themselves as life long learners. Therefore, organisations must develop environments in which continuous learning is promoted. Teachers, administrators, students, and school board members must be encouraged to be active learners who engage in innovative practice.

While simple to say, it may be difficult for school boards and administrators to shift their hiring practices from collecting experts in a subject to finding experts in learning strategies. Educators will have to shift from attempting to know all there is to know of a subject to being a guides or role models in the process of discovery and learning. Learners and community members (parents, etc.) will also have to shift their expectations of educators as experts to guides or facilitators of learning.

Implicit in all this reform and change is the revision of curriculum and teaching methods. Enormous staff development within the existing teaching population, as well among the professors at the university teacher training programs, will have to be undertaken in order to move past entrenched beliefs and reform educational practice (Brown, 1994; Caladine, 1993; Weir, 1992).

Furthermore, the diffusion of innovated, reformed practice will be complex. This research referred heavily to literature on the process change, organisational

It appears that an individual’s willingness to adopt change is related to their sense of personal power within the organisation and their understanding of the reason for the change. Other contributing factors are presented in Chapter Two (Section B); however, the basic ability of an individual to change appears directly linked to activity theory. If an individual’s needs are not met, Argyris (1992, 1993) and Fullan (1991) suggest they will engage in counterproductive activities that can stop the process, or default to traditional practices which they understand. This default effectively stalls the diffusion of innovation.

Chapter Two (Section C) suggests that reformed educational practice could be situated in computer supported learning environments. The characteristics of learning environments capable of promoting innovative practice and supporting knowledge-building are consistent with advantages promised in the literature for computer environments. However, unless the educational practices are reformed, there is a fear that teachers will simply re-creating the status quo online, adapting shop worn activities (Scardamalia & Bereiter, 1994; Spender, 1995; Stoll, 1995) for electronic delivery.

Along with the promises are problems surrounding the online environment. Researchers (Caladine, 1993; Trevino & Lengel, 1987; Walther & Burgoon, 1992) note concerns with virtual group work and the effect that the lack of social context clues have on communications. They identify the online environment as being lean, suggesting that some activities need a much richer environment to convey complex concepts or establish social interaction.

An area of educational practice that appears most compatible with computer supported communications is distance education. As the traditional practice in distance education is already quite socially impoverished (social contact usually limited to a course marker and communications via FAX or telephone), the possibilities of computer conferencing and social interaction with virtual classmates presents an exciting option for expanded interaction.

Therefore, the case study for this research was a distance education program, New Directions in Distance Learning (NDDL), which exists primarily in cyberspace. The design for the research is presented in Chapter Three. Background to the case study is provided by the following (1) a description of the setting for the research (phenomenology concerning the social, historical, and physical constraints of the program - Chapter Four); (2) a description of the researcher’s entry and relationship to the field (Chapter Three - Researcher’s Role); and (3) a description of the research design, development of the research frame (Goffman, 1974), methods used, and ethical concerns associated with the research (Chapter Three).
The case study (Chapters Four and Five) is presented in ethnographic
description, informed by action research (Argyris, 1992; Crawford, 1995b; Greenfield,
1984; Lomax, 1989). It includes a description of the social processes in the study,
organised around frames and codes (Goffman, 1974) which developed throughout the
research process. The information from the case study was analysed thematically,
initially based on content analysis categories developed from the literature. Some of the
information is presented in the first person voice (Thompkins, 1993), recognising the
role the researcher played in the program both as a participant and as a participant
observer. Spellings of computer terms (eg. e-mail) are based on the ILC Glossary of
Internet Terms (1997). No editing has been done to participants’ online messages
included in this research; they appear just as they did, offering a flavour of conference
communications.

This research set out to observe a community of learners which was expected to
form within an online learning environment. It was assumed that the community of
learners would develop and negotiate tasks which would enhance knowledge-building
as defined in Figure 9. However, when that assumption was found to be incorrect; the
research was refocussed to determine the causes of why a community had not formed,
exploring the learning environment and the organisational structure of the program.

Findings from the research are presented in Chapters Four and Five. A
discussion section concludes the research (Chapter Six).
CHAPTER TWO

REVIEW OF LITERATURE

One must learn by doing the thing, for though you think you know it - you have no certainty until you try.
- Sophocles, 400 BC

Literature for this review comes from a wide range of areas generated by the espoused theories guiding this research. Initially focused on knowledge-building and the promises and potential of computer-mediated communications, the review was expanded after a preliminary analysis of the data which resulted in the rejection of the first theory (Chapter Four). The first theory suggests that a community of learners would be formed within the virtual environment for this case study, and that this community would negotiate learning opportunities encouraging knowledge-building. When it became apparent that a community had not been formed, the theory was revised.

Guided by the literature of action research, especially double-loop learning and systems thinking (Argyris, 1992, 1993; Argyris & Schon, 1978; Chawla & Renesch, 1995; Senge, 1990), the research turned to the literature of organisational structure and learning organisations to determine what had affected cognitive and community development. These expanded areas informed the revised theory guiding this dissertation: schools must become organisations for learning capable of creating environments promoting innovative practice and knowledge-building for all learners (educators and students). Principle questions immediately arise from this revised theory:

- What is knowledge-building?
- What are the characteristics of an environment that supports knowledge-building?
- Can schools become environments promoting innovative practice and knowledge-building?
- Do existing organisations within education systems support knowledge-building?
- Can online computer environments promote innovative practice and support knowledge-building?

These questions form the organisational structure for this chapter.

Section A - Learning and the Development of Community

Introduction

The history of western attempts to formalise knowledge-building and situate the process in schools is short (Bereiter & Scardamalia, 1993; Perkins, 1992). During that time educators have seen their roles shift from being distributors of a discrete body of
knowledge to managers of an agenda consisting of traditional curriculum and a range of social issues. Perkins (1992, p. 162) observes

Responsible for teaching the traditional subject matters, they [teachers] are also asked to impact basic knowledge about health, sex, and the risk of AIDS, imbue youngsters with citizenship values, detect students with special needs or talents and respond appropriately, build students' writing skills whatever the subject matter, foster good thinking, ensure 'fun' participation, meet with parents, and so on and so on.

Once viewed as an activity conducted relatively in private within institutions, educators recently have watched education be placed on the global stage, linking it with the success of the new world economy (Education and the Wealth of Nations, March 29, 1997, p. 1). Various sectors of society now officially recognize "Education is the key to success in the new world economy" (p. 1) and are starting to ask what the key to success in education is. An initial response appears to lie in a link between understanding the nature of learning and the environment in which it occurs.

After years of research into knowledge-building, the sociology of classrooms, intentional learning, and international best practice, it appears that little or no change has taken place in most western educational institutions. While some educators and researchers suggest there is a need for more research into learning; others (Brown, 1994; Perkins, 1992; Rogers, 1993) argue there is a gap in the use-of-knowledge about learning. Perkins (1992, p. 3) comments

The problem comes down to this: We are not putting to work what we know. In the school down the street, in the school across the river, students are learning and teachers are teaching in much the same way they did twenty or even fifty years ago. In the age of CDs and VCRs, communications satellites and laptop computers, education remains by and large a traditional craft.

This traditional craft also tends to be an isolated craft that is practiced in a fragmented environment by those who typically feel disempowered and oppressed by rules, goals, and objectives imposed on them (Argyris, 1993; McLeod, 1997; Senge in O’Neil, 1995).

The issue remains how to improve educational practice? How can education reflect the promises of the new technologies that are available, meet the challenges presented by the new global economy, and provide for the needs of the diverse range of learners entrusted to its care?

It appears the time has come for schools to reflect on what is known about knowledge-building and reform their practices, re-defining learning as an organisational priority.
The Nature of Learning

Some researchers (Brown, 1992; Rogoff, 1990; Scardamalia & Bereiter, 1994;) suggest returning education practice to its earliest form - apprenticeship, recognising "... cognitive development is an apprenticeship - it occurs through guided participation in social activity with companions who support and stretch ..." (Rogoff, 1990, p. vii) a learner's understanding. These researchers note that cognitive development is furthered when the learners are allowed to take charge of their own learning, thereby participating in a community of learning.

Brown (1992, p. 141) suggests that an apprenticeship model will require the transformation of the traditional classroom from a site

... where students perform assigned tasks under the management of teachers ... into communities of learning (Bereiter & Scardamalia, 1989; Brown & Campione, 1990; Brown, 1994) and interpretation (Fish, 1980), where students are given significant opportunity to take charge of their own learning.

Brown notes the educational experience of a community of learners within a classroom requires an intentional learning environment.

Scardamalia and Bereiter (1994, p. 266) advocate intentional learning, adding that "... knowledge-building discourse is at the heart of the superior education ..." experiences they envision, linking the classroom to real world practice. They offer a computer environment, CSICLE, to support this discourse and have field tested CSICLE in schools over a number of years. Scardamalia and Bereiter (p. 266) situate their notion of knowledge-building discourse in "... three lines of research and thought: (1) intentional learning, (2) process of expertise, and (3) restructuring schools as knowledge-building communities."

The creation of an intentional classroom requires a paradigm shift on the part of the teachers and learners. Rather than being "... relatively passive receivers of wisdom dispensed from teachers, textbooks, or other media ..." (Brown, 1994, p. 149), learners "... are encouraged to engage in self-reflective learning and critical inquiry ...." (p. 150). Teachers are required to "... serve as active role models of learning and ... responsive guides to students' discovery processes. They teach on a need-to-know basis responsive to students' needs ... (p. 150)."

Brown bases much of her theory on observation of teachers and students. In one study involving teachers and below average year seven students, she suggests the development of routines which could gradually support more complex tasks. The degree to which this theory can be generalised to more able students and actual classroom practice is not discussed. However, the supportive environment proposed
by these routines appears consistent with the intentional classroom concept and the environment promoting innovative practice and knowledge-building envisioned in this research.

Two important aspects, assessment and curriculum, are at the core of an intentional learning environment. Assessment must reflect the learner's ability to "...discover and use knowledge, rather than just retain it" (p. 150). It must move beyond a surface evaluation of demonstrable skills (Bereiter & Scardamalia, 1993) to the deep assessment of a learner's ability to construct knowledge with what has been learned. In other words, learners must be allowed to demonstrate their personal interpretation and understanding. They must be encouraged to take risks with their learning, going beyond generic activities and engaging in personally relevant, innovative practice.

In order to support that form of assessment, the curriculum design must be flexible and capable of reflecting the learner's changing interest, developing understanding, and personal learning style. Perkins (1992) calls this type of curriculum metacurriculum; curriculum that contains metacognitive knowledge that digs deeply into how things work, what things are, and a relationship in a broader context. He suggests that currently metacurriculum does not appear until graduate school, if at all, and by then the overwhelming majority of learners have left the system.

Assessment and curriculum, such as that described above, support the notion of discovery learning (Dewey, 1929), suggesting that learning occurs best when learners are allowed to discover it for themselves. This moves away from simple parroting of information to the development of personal understanding. Schumacher (1973, p. 83) suggests that "Education which fails to clarify our central convictions is mere training or indulgence." Deep learning, however, requires a supportive environment for all involved as teachers must be allowed to experiment with curriculum innovations, and students may experience varying degrees of initial success. Discovery and experimentation must be supported for all learners - both teachers and students.

Scardamalia and Bereiter (1994, p. 266) suggest

Although a great deal of learning is unintentional, important kinds of school learning appear not to take place unless the student is actively trying to achieve a cognitive objective - as distinct from simply trying to do well on school tasks or activities.

This distinction supports the Russian view of activity theory which distinguishes most worksheet type assignments from deeper cognitive activities which are learner focused and require a great deal of intentional action, mental reflection, and expert support to complete.

Posted to the Mind, Culture and Activity online conference, Mike Cole (email communication, March 20, 1997) notes
Several years ago Vasili Davydov ... gave a talk in which he said you will never see educational activity in a standard school. Missing from the ordinary classroom is the process of goal formation which is simultaneously an important moment of sense-making. I link this observation to Vygotsky's principle that 'thought is completed in the word.'

Activity theory views activity from three standpoints: motive (need), goal, and conditions. "The goal, which is embedded in a specific set of conditions, comprises the task of the activity" (Zinchenko & Gordon, 1981, p. 74). In other words, learners' needs or motives impel their activities toward goals. Goals are the representation of the result of an action while conditions are the resources or environment under or with which the goal is eventually achieved.

![Diagram]

**Figure 1.** Activity theory reflecting the impact of conditions on a learner's goals.

An activity is first completed as an external, social action, usually in collaboration with others, but motivated by a learner's needs. Through social interaction, activities become internalised into the individual's consciousness and are transformed. "During this transition these processes undergo specific changes - they become generalized, verbalized, abbreviated; and most importantly, they become the means for further development" (Zinchenko & Gordon, 1981, p. 74).

Vygotsky (1981, p. 154) views the development of actions in three stages: (1) instinctual; (2) learned or trained; and (3) applied or adapted. The first is innate or inherited; the second mastered while the third is intellectualised or adapted to function in new conditions. These stages are seen in a hierarchy of "... habits used for solving new problems." Each stage requires an external period of mediated activity before being transformed into the individual's personal consciousness and incorporated into his/her personal background or history. Therefore, Figure 1 is expanded in Figure 2 to reflect the continuous role goals have on shaping personal history which continues to affect individual needs or motives in further activity.

The impact of social interaction on the establishment of personal history is key to Vygotsky's work. Through this interaction cultural tools and signs help to mediate learning, moving it from an interpersonal (external) process to an intrapersonal (internal) one. Conditions also affect how the actions are carried out, suggesting the need for an environment promoting innovative practice and knowledge-building as well as
developing trust and fostering social interaction. In this sort of environment, learners can internalise their activities, reflecting on the experiences before continuing further action. This allows for the development of cognition at a learner’s own pace and based on her/his needs, recognising the amount of time required for individual reflection and knowledge-building cannot be pre-determined as through it were piece work done on some sort of intellectual assembly line.

![Social Interaction Diagram]

**Figure 2.** The impact of social interaction on personal history and conditions.

The social context in which learning takes place affects not only the individual but the conditions (environment) in which the individual learns. As Russell (email communication - Mind, Culture, and Activity online conference, April 26, 1997) notes Contradictions in people’s ... motives arise ... as their histories unfold variously and dynamically. These deep contradictions are played out in changing power relations among individuals and groups, which can be analysed at both micro and macro levels by tracing the variable uses of ... tools to mediate the contradictions and transform activity ...

Variations and contradictions in terms of individuals’ home environments, nutrition, personal backgrounds, economic status, geo-political locations, etc. all affect their ability to develop and participate in learning activities. These variables, among others, form an individual’s constantly evolving culture. Valsiner (1994, p. 38) notes ‘... culture cannot be taken over by people as a currently existing entity. Instead at any moment, it is in the process of being reconstructed in a novel form by constructive internalization and externalization processes.”

Researchers (Wertsch, Del Rio, & Alvarez, 1995, p. 11), in the field of activity theory, note that there is much discrepancy over the cultural interpretation of the term culture, questioning whether it refers to social culture or historic culture or a combination of the two. The figures included in this research use the term socio-cultural as it ‘... explicates the relationship between human action and cultural, institutional and historical situations in which ... action occurs.’ The term personal
history is also included in the figures as it validates the unique experiences that individual learners within a cultural group bring to their activities.

Therefore, each individual’s capacity to internalise learning is unique due to her/his personal histories and socio-cultural influences. This statement is consistent with contemporary research on cognitive apprenticeship (Greenfield, 1984; Lave & Wenger, 1991) and casual observations of actual practice. Cognitive apprenticeship suggests that intentional, internalised learning is common practice in the world of work as workers draw on previous experience and seek information from more experienced peers to complete tasks that are within their skill area but outside their personal range of expertise. Collaboration, in this manner, supports the Vygotskian (1978, 1981, 1986) notion of scaffolding. It is essential in classroom activities for higher order thinking to occur as it assists learners to do more with assistance than they are capable of independently, allowing their external activities to be increasingly more complex.

Situating learning in actual work is at the heart of Lave and Wenger’s research (1991), especially their observations of mathematics in the context of tailoring clothing. Here learners and experts interact, using the tools of tailoring to mediate activities. However, situating “real” learning experiences in traditional classrooms, making them relevant to the individual learning of each student, is a challenge. It may require the re-organisation of traditional school practice, allowing experts from outside the traditional school environment to assist in situated learning experiences and exposing learners to the actual practice employed by experts. Classrooms will have to be restructured to allow for innovative practice, creating environments that support the processes used by experts to solve complex problems.

The process of expertise is a principle of intentional learning. Scardamalia and Bereiter (1994, p. 266) characterise it as progressive problem-solving. They suggest that not only is this the process used to become an expert, but it “... characterises experts when they are working at the edges of their competence.” Allowing learners to gradually increase the degree of complexity of problems affords the expert and novice time for the knowledge-building discourse. It builds on the social construct of learning and appears to be consistent with activity theory, allowing learners’ needs to determine activities.

Progressive problem solving is more complex than simply doing better on the next activity. It requires learners to translate what was last learned into “... a better articulation of the goal or problem so that the next effort will be better conceived” (p. 266).
Figure 3. Needs determined through progressive problem solving.

Researchers (Bereiter & Scardamalia, 1989; Brown, 1994; Rogoff, Gauvain, & Ellis, 1984; Wertsch, 1981, 1985) support activity theory and the concepts of intentional learning, suggesting "... thought develops from experience in socially structured activity through the internalization of the processes and practices provided by society and its members" (Rogoff et al., 1984, p. 321). All appear to agree that learners can achieve more with assistance than they can independently and recognize Vygotsky's (1978) notion of scaffolding which explains that assistance should be within the learner's "... 'zone of proximal development' (the region of sensitivity to instruction where the child is not quite able to manage the problem independently and can benefit most from guidance)" (Rogoff et al., 1984, p. 322). Vygotsky (1978, p. 85) states that what learners can do "... with assistance of others might be in some sense even more indicative of mental development than what they can do alone."

Vygotsky bases this notion on the observation of children engaged in higher order cognitive activities (memory, thinking). Of particular importance is the relationship of social factors in the completion of the task. This is consistent with supportive environments which allow learners to seek assistance and discuss what they need to know. It places the NEED back into the activity. Without a reason or need to engage in an action, there can be little point to serious engagement which is all too often reflected in student performance on teacher-directed activities. The result is learners become unable to see the relevance in what they are directed to learn. Saljo and Wyndham (1993, p. 339) report that learners in school settings rapidly discover that the "... knowledge valued is generally of the abstract, literate type and ... orient ... their activities in accordance... ." Saljo and Wyndham determine that the knowledge gained in this manner has little relevance beyond the school context and is of little use in other applications. Cazden (1988, p. 72), focusing on the value of classroom discourse for the determination of learner need, notes
Relevance is an important characteristic of good education, but sometimes we look for it in the wrong places. Relevance is often advocated as a necessary characteristic of curriculum materials. Instead, it should be considered a characteristic not of the materials but of the relationship between the materials - any materials - and the learners.

Rogoff et al. (1984, p. 322) appear to support Cazden, suggesting an adult’s role might include assisting learners make connections or find relationships between their learning and the curriculum. They state that it is the role of the adult to create "... a common framework for the coordination and the exchange of information ..." within the community of learners and to "... facilitate learning by regulating the difficulty of the task and providing a model of mature performance.” This observation comes from their work with primary students where they observed the interactions of children and adults (often the children’s mothers) as they completed complex tasks. Because Rogoff encourages the instructor to model activity, there may be a risk that the learner’s needs may become secondary.

Expanding individualised interaction and the creation of a common framework into a classroom requires expanding the concept beyond two people (adult and child) into a community of learners (adults and learners at different levels of understanding) thereby considerably increasing the size and complexion of the community. The potential exists for the teacher to default to a generic framework for the larger group thereby plunging the innovative practice of individualised instruction back into the traditional practice of direct instruction. This is an area of caution if the size of a community of learners increases in relationship to its access to experts.

Brown (1994, p. 7) supports the notion of community, adding that further conceptual understanding is derived from developing "... common knowledge, beliefs, and expectations ..." within the learners themselves. Viewing community from a sociological perspective, Kanter (1972, p. 22) notes that individuals only become part of communities through active participation. Therefore, community leaders must ensure the actions of the group are inclusive rather than exclusive in order to maintain a sense of "... equity and social justice.” Translated into an educational context, inclusive activities must reflect individual differences among learners which include their prior knowledge, learning styles, previous experiences, etc. (personal histories).

Brown (1994, p. 9) theorises five steps in developing a community of learners within an educational program. First, learning must be active, with a clear purpose. It must be intentional. “Effective learners operate best when they have insight into their own strengths and weaknesses and access to their own repertoires of strategies of learners.” This is consistent with activity theory, allowing a learner’s needs to determine the activity, and differs from most school activity where “... students are encouraged to participate in goal-directed actions even if, or indeed particularly if, they
are not yet capable of carrying them out efficiently and correctly" (Wertsch, Minick, & Arns, 1984, p. 169).

Second, the learning environment must encourage and support the establishment of proximal zones of development. It must reflect the understanding that learners are not all at the same point of understanding at exactly the same time. Recognition of the skill diversity among learners and the potential of learners with assistance is crucial to dynamic teaching and learning.

Third, the program and the instructors must legitimise learner differences. Learners must be made to feel that it is natural that they are at different points in the learning. Diversity of understanding must be recognised and encouraged.

Traditionally, school agendas have aimed at just the opposite, decreasing diversity. This is based on the false assumption that there exist prototypical, normal students who, at a certain age, can do a certain amount of work, or grasp a certain amount of material, in the same amount of time (Brown, 1994, p. 10).

Fourth, a community of discourse must be developed - knowledge based discourse. Discourse supports an interpretive community among the learners that establishes the "... structure, goals, values, and belief systems ..." (p. 10) for the group which aids in knowledge-building. Rich, sustained dialogue becomes an agent for decontextualisation of information, allowing for personal understanding. Vygotsky (1978, p. 131) states because learning is viewed as "... a profoundly social process [it] emphasises dialogue and the varied roles that language plays in instruction and in mediated cognitive growth." The ability to engage in academic discourse is seen as a method to assist an individual's knowledge-building within a community of learners.

In essence, dialogue is one of the first steps toward inner speech and the internalisation of higher order thinking (Bruner, 1987). Bereiter & Scardamalia (1993) caution that this discourse is not the same as the teacher initiated question / student response model employed in most classrooms. It is a progressive interaction reflecting the grabbing with and eventual understanding of increasingly complex topics.

Fifth, the program must develop a community of practice. Learners must feel that they own and can use the information they have acquired. The ability to use information is crucial to a learner's sense of its relevance (Cazden, 1988; Marton & Ramsden, 1988) and links activities to needs and goals, moving them from isolated events to integrated activities with clear purpose and reason. A community of practice allows learners to work together to use the information, recognising that all the learners have important contributions to a product and that the diversity of each learner has value.

A community of practice provides an insider view as to how actual work is completed. Collins, Brown, and Newman (1989, p. 457) state expert practice, a key
component of a community of practice, is a "... method ... aimed primarily at teaching [less experienced individuals] the processes that experts use to handle complex tasks." In this method, experts show the strategies they use in their actual practice to carry out specific tasks. They also share their conceptual knowledge and attempt to situate that knowledge in specific tasks which are relevant to the learner. Factual knowledge and conceptual knowledge are presented in a situated context, and learners are encouraged to question and explore. "In expert practice, the experts weave the concepts and the facts, connecting the information and providing scaffolding as the learner assimilates the knowledge and negotiates her/his meaning" (Crichton, 1993). Lave and Wenger (1991, p. 21-22) state the

... apprentice's [learner's] ability to understand the master's [expert's] performance depends not on ... possessing the same representation of it, or of the objects it entails, but rather on ... engaging in the performance in congruent ways. ... Quite simply, if learning is about increased access to performance, then the way to maximize learning is to perform, not to talk about it.

A community of practice also allows learners to share their internalised knowledge, moving it from a tacit form (Nonaka & Takeuchi, 1995) to an explicit form. This transposition process encourages community learning as well as further individual knowledge-building. Nonaka and Takeuchi suggest this is the method used by Japanese companies to create new knowledge. They identify the use of figurative language and symbolism to share tacit knowledge and the need for a supportive environment in which creative chaos can create new knowledge. These concepts appear consistent with dialogue and a supportive working environment - a variation of Newman, Griffith, and Cole's (1989) construction zone for knowledge-building. Nonaka and Takeuchi (1995, p. 71) suggest the concept of a knowledge spiral continuously linking tacit and explicit knowledge together through internal and external knowledge building. Critical to each link is the use of dialogue and actual practice; dialogue connecting external knowledge-building and actual practice connecting the internal.

Brown states that the five steps for community development are interconnected, and when used together, form a system. This system appears similar to Scardamalia and Bereiter's (1994) knowledge-building community.

It must be noted that the development of a community is more than placing learners into groups for specific tasks. Experience in traditional classrooms has shown that learners can be placed into groups with the intent of learners engaging in higher cognitive collaborative activities. However, a knowledge-building community rarely develops. There appears to be a gap between the theoretical constructs of community building and actual practice. Brown's work, for example, has focused on small groups
engaged in short term activities. Additional research is needed in long term interactions, sustained over the duration of a school time frame (eg. semester or academic year). The ability of the community to incorporate the needs of all the group members is also a concern. Activity theory suggests learners must have their individual needs met in order to achieve personal goals; potentially this is a challenge in the group context.

Researchers (Ancona & Caldwell, 1990; Galegher, Kraut, & Egido, 1990a; Walls, 1994) identify specific characteristics that distinguish a community from just a group of people. Walls (1994, p. 155-156) states the term community cannot be used unless "... (1) there is extensive participation by its members in the decisions by which its life is governed, (2) the society as a whole takes responsibility for the members, and (3) this responsibility includes respect for the diverse individuality of these members." Walls summarises these three points by stating "Community, then, must be seen as emerging from the mutual involvement, mutual responsibility, and mutual respect between a society and its individual members." A willingness to trust and support others is a trait not often found in schools (Fullan, 1991; Perkins, 1992) where teachers typically view their actions as solitary and often in competition with others for scarce resources and learners compete for grades.

Community development requires that its members have mutual involvement in the task which has brought the individuals together in the first place. Walls (1994) suggests that human social activity is based on three general premises: (1) there is a task that is best done in a group context, (2) there is a relationship between the members of the group, and (3) there is a method of sharing a space for the group to work in. He illustrates these premises, using the commonly heard phrase: "The reason we are all here ...." The reason represents the task; we the group; here the shared space, suggesting tasks bring the groups physically or virtually together.

These observations appear based on the study of group activity in cross-cultural settings, focusing on the social and cultural aspects intellectual team building. While not specially addressing educational institutions, Walls stresses the importance of the task to bring the community together, especially in online team building activities. This concept is central to the discussion of educational group practice. How the task is determined, who controls the process of solving the task problem, and whether or not the task itself can be negotiated by the learners is at the very heart of intentional learning. Typically in schools, tasks are something that are received not negotiated. Therefore, a community of learners will never develop until this power relationship changes.

The power relationship, suggested by Russell (E-mail Communication), is quite a variable. Considering that social interaction among individuals is mediated by
dialogue (discourse) and the use of tools, various lines of thought concerning mediation strategies arise. While overly simplified to a degree, mediation or intervention by an expert (more experienced peer, subject specialist, teacher, etc.) appears to fall into one of two general categories (1) co-learners where both actively build knowledge or (2) expert/novice where one constructs frameworks, modeling learning and scaffolding and the other apprentices to the expert. If it is the later, a power relationship appears to be implicit.

Figure 4. Mediation strategies for co-learning and expert/novice intervention models.


The degree to which power is shared in the expert/novice model is a variable dependent on the individual experts. The degree of access learners have to tools and the voice they have in task determination can be viewed as a demonstration of the power available to them. Without a voice, learners are not empowered to express their needs, and the innovative practice envisioned in this research is not possible. Therefore, the degree to which power is shared among learners (teachers and students) directly affects the ability of learners to accomplish their goals.
Rogoff (1994, p. 96) suggests that it is the job of the more experienced member of the community to "... arrange the occurrence of cognitive tasks ... regulating the difficulty of the task ...;" Vygotsky's (1978) notion of the zone of proximal development. Lave (1993), Keller & Keller (1993), and Rogoff (1994) suggest it occurs after expert modeling; a strategy which occurs in everyday activities among people of various ages. The use of pointers, modeling, and previous experience is a common approach to problem solving in real life; and the potential to use those techniques in the school setting seems possible. Rogoff & Gardner (1984, p. 96) observe that "When faced with a new problem, individuals weave what they know about solving other problems and information about the new problem into a coherent approach which transforms the novel problem into a more familiar problem." This is an exciting point in the process of problem-solving; learners recognising for themselves that a new problem is not impossible, but that it is actually made up of pieces of previously learned information.

This is consistent with Bereiter & Scardamalia (1993, p. 33) who state progressive problem solving strategies depend on what an individual knows, suggesting that "... expert and novices alike tend to employ the strategy best suited to their state of knowledge."

However, Scardamalia and Bereiter (1994, p. 266) suggest that the implementation of the steps required to build a community of learners will require the "... restructuring of schools as knowledge-building communities." They identify this restructuring as creating a second-order environment similar to that of competitive sports or business, suggesting that "... the accomplishments of participants ... [raise] the standard that the others strive for." The collective knowledge of the group is increased and members are required to continually adapt and make "... contributions beyond what is already known."

Teachers or coaches in these environments are characterised by their ability to find a balance between learners' abilities and the challenges presented to them, creating a flow of activity that does not create undue anxiety or result in unnecessary boredom (Bereiter & Scardamalia, 1993) and developing tasks that are not too difficult so as to be threatening or too easy so that they are not stimulating.

Second order environments embrace many characteristics of Senge's (1990) learning organisations (Section B). Rather than using the term second order environment, it seems a more descriptive term (environment promoting innovative practice), might be clearer (Figure 5). If learners feel that innovation is valued and that it is safe to experiment and wrestle with personal meaning making, they can become information explorers or bricoleurs, individuals who tinker and adapt learning to match personal needs. Papert (1980) and Rheingold (1991) use the term bricoleur to describe
learners who freely explore complex technology, discovering how to use things based on their own inquiry and needs (Section C).

![Diagram](image)

**Figure 5.** Importance of learning environment on goals.

If an environment is not supportive of innovative practice and the potential for error, typically individuals will engage in activities that they perceived to be safe and certain to achieve the socially acceptable, predetermined goals. Because traditional schools suffer from the tyranny of the right answer (Stoll, 1995), they create a competitive atmosphere which stresses not only being right but being the first and only one who is right. Therefore, revised curriculum and assessment are essential components of a learning environment supporting knowledge-building.

Considering all that is known about learning and the environments that appear to support it, one can support Perkins' (1992) notion, presented earlier in the introduction to this section, that educators are not suffering from a gap of knowledge, but a gap in the use of knowledge. Argyris and Schon (1978) would identify this gap as the difference between theories of action (espoused theories) and the theories of actual use (Section B). It appears that schools are simply not incorporating reformed theories of action into their actual instructional designs.

Since Vygotsky (1978, 1981, 1986) and Leont’ev’s (1981) work was translated, activity theory has informed western educational research. Researchers (Brown, 1994, 1992; Lave and Wenger, 1991; Rogoff, 1990, 1994; and others) have built on the notions of ZPD, activity based on learner needs, and the socio-cultural impact learning environments have on knowledge-building. Paralleling these activity based theories have been theories of actual use reflecting the strong social and political lobby of a “back-to-basics” movement reinforcing teacher direction and non-flexible national curriculum. Welch (1996, p. 89) cites the Australian experience noting “The rationale for the reactionary core curriculum supported by proponents of back-to-basics program, however, is simplistically based on a rejection of progressive or child-centred
pedagogies, and critical literacy ... ” This return to the didactic-centred rather than inquiry-based model only further illustrates the political arena into which education has been tossed. Curriculum is often driven in reaction to perceived political, economic, and social conditions rather than principles of knowledge-building and an understanding of learner needs.

Brown (1994, p. 4) sums up the status of contemporary educational practice by observing

Instruction is a major class of aids and tools to enhance the mind.
To design instruction, we need appropriate theories of learning and development.
Enormous advances have been made in this century in our understanding of learning and development.
School practices in the main have not changed to reflect these advances.
The question ... is, Why?

Summary

It is generally assumed that the focus of schools is learning. However, research on the nature of learning is not consistent with the actual educational practice. Traditional reliance on direct instruction is not supported by theories of learning or knowledge-building.

Intentional learning and a focus on learning activity is crucial to move from traditional practices to the development of environments promoting innovative practice and knowledge-building. These environments can support social interaction and the development of communities of learners, allowing learners to shift from simply knowing fragmented pieces of information to developing meaningful personal understanding. Knowledge-building, in the context of this research, refers to the construction of personally relevant learning based on individual needs and goals.

Research Questions

(2A1) Can schools re-situate learning at the heart of the school agenda?
(2A2) Can educators incorporate what is known about knowledge-building into actual practice?
SECTION B - THE NEED FOR EDUCATIONAL REFORM

_The innovator makes enemies of all those who prospered
under the old order, and only lukewarm support is forthcoming
from those who would prosper under the new._
- Niccolo Machiavelli - *The Prince* (1513)

Introduction

While the majority of western schools appear either unwilling or incapable of incorporating the research into knowledge-building into actual practice, researchers in both the economic community and the academic community cite the need for reform in the delivery of education. Odasz (1994) states that "... we are facing a paradigm shift away from competitive, industrial 'product-based' manufacturing, and toward a collaborative 'information-based economy'" (p. 2). He adds "... the key to success in the information age may be the ability to become partners with those who represent sources of continually expanding expertise beyond one's own area of specialty" (p. 4).

Educational institutions need to recognize the skills required for this paradigm shift and assist their participants to develop them.

However, the pursuit of these new skills may be in conflict with traditional education which has a predetermined curriculum and an evaluation mechanism that allows its institutions to "... function as a form of religious, political, and ideological censorship" (Kvale, 1993, p. 220). The power to control "... what knowledge and opinions are acceptable and which may obtain an official authorization as legitimate knowledge ..." (p. 220) continues to be the domain of centralised, government education.

Kofman and Senge (1993) note that because organisations, such as schools, are microcosms of society, affecting change will require "... addressing the basic dysfunctions of our larger culture" (p. 17). They suggest "... there are three fundamental problems with our current paradigm: fragmentation, competition, and reactiveness" (p. 17). Learners continue to have their education fragmented into discrete disciplines and testable units while being encouraged to compete against one another for grades and seats in universities or other tertiary institutions.

It is no wonder that Royal Commissions into education, such as the Sullivan Commission in British Columbia, Canada (British Columbia Ministry of Education, 1989), discovered a reaction to the current system from individuals across the economic, social, and political spectrum.

The Sullivan Commission toured the province hearing thousands of individuals and receiving numerous written submissions. When all the results were collated, three basic problems emerged. The Commission attributed these problems to two fundamental causes (1) learners felt the basic education was not relevant and (2) the actual organisational structure of the schools was wrong. When this information was publicised, informants to the commission generally supported the findings. It would be surprising if these findings
were unique to British Columbia. The three problems identified were (1) learner dissatisfaction with the educational system, (2) low literacy rates, and (3) high drop out figures which were increasing.

Schools must change the way in which they currently operate and re-situate unfragmented, intentional learning back into the center of the organisational agenda. They must become organisations for learning (Figure 7). Education reform is needed to create and sustain an academic environment in which knowledge-building can take place. A balance must be found between what is known about learning (Brown, 1992; Glaser & Resnick, 1991; Lave, 1993; Rogoff, 1994) and the "... bureaucratic stroke of genius ..." (Kvale, 1993, p. 218) that is standardised curriculum and government examinations.

Educational Change

Current literature (Brown, 1994; Caladine, 1993; Weir, 1992) suggests that there are three main components needed for educational change: (1) the possibility of using new or revised materials; (2) the possibility of developing and using new teaching approaches; and (3) the possibility that those involved in change will or have altered entrenched beliefs and will be open and ready to accept change.

The first two components relate specifically to curriculum and materials which usually affect teaching approaches. These typically have been pre-determined by the institutional bureaucracy of most schools, resulting in individuals having limited say in content development or implementation style. When schools become organisations for learning, they can begin to involve learners (educators and students) in the development and implementation process.

Component three concerns the individuals and their personal commitment to changed educational practice. The literature (Argyris, 1993; Fullan, 1991; Rogers, 1983) supports the notion that without a reason and/or will to embrace change, participants will continue with the status quo, satisfied with the degree of success and security they achieve.

For schools to transform themselves into organisations for learning, the majority of participants within the organisation must eventually either change or leave. In the earlier stages of change, when change is still perceived as an option or too high a risk, individuals engage in what Argyris (1993, p. 28) identifies as defensive routines. These routines are employed by members of organisations to maintain the status quo. While defensive routines can be unrecognisable to an individual, they are generalisable across organisations whether they be business, education, and government. In education, defensive routines are established across the academic spectrum (administrators, educators, support staff, and learners), and individuals gradually develop a "... hidden pedagogy of survival results, which the players act out skilfully and routinely."
While members of the education system (those mentioned above as well as parents, politicians, community) may discuss the need for educational change and innovation, the hidden pedagogy continues, supported by entrenched defensive routines held by organisation members and stakeholders alike. Because of this, Argyris (1993, p. 28) asserts that the real issues remain "... undiscussable, and undiscussability and uninfluenceability are seen as 'natural'; that's the way it is." Consequently, schools continue to produce "... the very consequences of ineffective schooling that they decry." Assuming this is correct and recognising that schools need to reform their practice in order to support knowledge-building, how can change occur?

Organisational Change

It is generally recognised that major personal and organisation change must occur if reformed educational practice is to be actualised (Argyris, 1993; Fullan, 1991; Kotman & Senge, 1993).

Senge (1990), focusing on the issue of organisational change, suggests that it can only happen when organisations make major paradigm shifts and become learning organisations. The concept of learning organisations builds on the work of Argyris and Schon (1978, p. 9), who suggest "... organizations can only learn through the experiences and actions of individuals." The documentation of this learning begins to make up the organisational memory, an ongoing collection of artefacts (documents, graphs, etc.) and recorded experiences, which becomes an essential artefact of a learning organisation.

Argyris & Schon (1978, p. 29) suggest that organisational learning occurs
... when members of the organization act as learning agents for the organization, responding to changes in the internal and external environments of the organization by detecting and correcting errors in organizational theory-in-use, and embedding the results of their inquiry in private images and shared maps ...

This type of organisational learning is characterised as double-loop learning and is supported by organisational dialectic and organisational memory which requires participation from all members.

Argyris and Schon base these notions on interviews with individuals within the organisation and analysis of the organisational artefacts (reports, structure, etc.). They create cases or scenarios which illustrate specific examples of behaviour or theory. Much of their work is in business settings or schools.

Mink, Owens and Mink (1993, p. 44) state an organisation "... becomes empowered when its employees have the power to develop solutions and the permission to act in relation to those solutions." This view is developed through observations of teams, especially in high performance coaching situations. It suggests that individuals within an organisation
must see the reason to change because "... reasons for rejecting innovations are every bit as rational as those of the advocates promoting them" (Fullan 1991, p. 130).

Fullan's work refers specifically to teachers, suggesting that reason is the key word in educational change. The ability of individuals to understand the reasons behind change is at the heart of systems thinking; they must be capable of situating a change in the larger context of the organisation. Without this ability, the individual and the organisation are becalmed in reactive, single-loop responses to change. It appears that the ability to understand the larger context is linked to an individuals' personal agency and their conceptual awareness of the system.

This need is no different from the need to participate in the negotiation of task development, suggested in Section A. In terms of learning to adopt to change, individuals must be allowed to engage actively in the process and participate as learners and agents for change. A challenge to systems thinking is that most individuals think in linear progressions and cannot see the inter-relationship between the various parts.

Much linear thinking is supported by single loop learning (Argyris & Schon, 1978, p. 18) which produces reactive responses to issues as they arise. Rather than seeing a situation in the total context, problems tend to be fragmented from the whole and solved, reacting to the symptom rather than the cause.

In the case of many organisations, individuals often are placed in groups to solve problems. Often these problems have been caused by a previous group's solution and no one realises the connection. Over time, groups begin solving problems arising from the solutions to previous problems, and eventually the organisation bogs down into "organizational entropy" (p. 18); a manufactured condition or structure holding the organisation prisoner from development. This situation is all too familiar to teachers who have been assigned to groups to cope with everything from lunch time violence to poor performance on international math and science tests; eventually they get the sense they have seen it all before and opt out of the problem-solving process, allowing entropy to plague the system.

To move beyond the single loop response, Argyris (1993), Senge (1990) and others develop the concepts of organisational dialectic and organisational inquiry, building on the idea of connected thinking and a systems view of issues. These two organisational strategies are core to double loop learning and move individuals in an organisation beyond reactive responses (eg. It's too hot, turn down the heat) to dialogue and interaction (eg. It's too hot, let's discuss it and see if it's just me or a potential fire behind the door).

Senge (1990, p. 99) labels this as quality circle activity; the process of "... more open communication and collaborative problem solving..." which allows the organisation to be structured around groups working on areas of expertise, but requiring the groups to interact through dialogue and inquiry. This may tend to paint a rather simple picture of organisational action; a sense that one can maintain the status quo but get together regularly.
to talk about it. However, it goes much deeper. It requires groups to develop a process to share insights into problems and determine the causes and effects of action.

The literature cautions about assumptions concerning issues of communications and their relationship to personal agency. Cicourel (1990) states

... socially distributed cognition refers to the fact that participants in collaborative work relationships are likely to vary in the knowledge they possess (Cicourel, 1974; Schultz, 1964) and must therefore engage each other in dialogues that allow them to pool resources and negotiate their differences to accomplish their tasks (p. 223).

He continues to say that this work-related discourse is often taken for granted “... due to the difficulty of developing appropriate measures of how authority structures and policies are revealed...” (p. 224).

A process for determining these measures is suggested by Rogers (1983).

The innovation-decision process consists of five steps: (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation. Individuals progress through these steps moving from their first awareness of an innovation or change to their decision to adopt or reject.

- Knowledge reflects an individual’s initial awareness of the innovation or change, and their attempts to gain an understanding of what it is and what it can do.
- Persuasion reflects the intervention of others into the decision process and their attempts to convince the individual to adopt or reject.
- Decision reflects the individual making a choice to adopt or reject.
- Implementation reflects the use of an innovation or change once the decision to adopt it has been made.
- Confirmation reflects the need to confer with others to make certain the correct decision has been made. At this stage all the previous steps can be overturned and the opposite decision made.

These steps appear quite reasonable both from an organisational and personal perspective as experience suggests that intervention at both the persuasion and confirmation stages can be overpowering, especially if an individual feels the weight of an entire organisation’s conflicting views or a good friend’s strong objection. Therefore, it is interesting to pursue Rogers’ research further to determine how individuals respond to these steps.

He suggests that there is a measurable rate of adoption for most innovations or changes within a social system and notes that individuals within a social system fall into adopter categories: (1) innovators 2.5%, (2) early adopters 13.5%, (3) early majority 34%, (4) later majority 34%, and (5) laggards 16%. The frequency of individuals falling within these categories reflects a bell curve of distribution. Before simply embracing these
categories, it would be interesting to pursue the relationship between personal agency (an individual’s personal history and sense of power) and adopters categories. However, that has not been done for this research.

- **Innovators** tend to be information seekers who act with high degrees of personal agency and need little support from organisations or peers. While they require resources to be innovative, they function well within their own network of other innovators, tending not to be affected by the pressures of the social group. In terms of an organisation, they “... play a gatekeeping role in the flow of new ideas into a social system” (p. 248).

- **Early Adopters** tend to be seen as role models for change. Those that follow see them as leaders, and innovators turn to them as the “local missionaries” for expediting change or innovation throughout the system. Their network includes both the innovators and the majority, and they tend to be leaders within the system.

- **Early Majority (Early Mainstream)** are not leaders. They look for leadership and function as the connecting glue in an organisation linking the innovators with the sceptical late majority or mainstream. Once they move through the innovation-decision process, they are committed to the decision.

- **Later Majority (Later Mainstream)** adopt innovation when there is no longer an option. They must be persuaded that there are benefits to the innovation. They are affected directly by peer pressure.

- **Laggards** tend to adopt an innovation or embrace a change once it is no longer an innovation or a change, usually well after the organisation has started into the next innovation or change. “While most individuals in a social system are looking to the road of change ahead, the laggard’s attention is fixed on the rear-view window” (p. 250).

**Figure 6. Adaptor categories**

The adaptor categories are particularly relevant in the understanding the diffusion of innovations such as technology in schools, and tend to reflect the implementation of technology into classroom applications (School District Technology Plans, 1997). For example, research to determine the degree to which adaptor categories are evident in educational computer use would be valuable as it has been observed (Kerr, 1991, p. 131) that the early adopters and innovators of technology in schools have been “... guilty of hubris: We start from a premise that the value of the new approach we urge is self-evident, and that the teachers should naturally want to shift their ways radically to take advantage of the new.” This does not suggest that hubris of this type can cause laggards to join the early mainstream; however, it questions whether it does speed up the process by which the later majority might begin to adopt change and may be relevant to understanding attempts to diffuse other educational innovations in schools.

Adoption of change or innovation appears to be affected by a number of variables.
• Access to information
• Ability to critically assess information
• Ability to view information in the larger context
• Sense of personal agency to respond to information
• Sense of safety in environment to comment on information
• Previous experience with the organisation in similar situation.

Expressed in activity theory (Figure 5), it appears an individual will engage in a decision making process based on their personal history, the organisational environment, and their perceived need to make the decision and take action.

Understanding adopter categories may be useful for organisational learning, recognising that the organisation can only learn through and with its individual members. Therefore, individuals must be viewed individually as it would be an error to assume that all members in an organisation were capable of embracing change at the same rate or possess the same degree of personal agency. It is equally critical to understand that individuals must be allowed to engage in a thoughtful process before adopting or rejecting change. Change cannot be mandated if an organisation is concerned about learning and developing (Argyris, 1993; Senge, 1990). The importance of the process and categories will be discussed further in Chapter Four.

It would also be equally erroneous to assume all individuals within an organisation would be empowered to adopt change or engage in an innovation-decision process. It appears that Rogers (1983) assumes that social systems are already functioning as learning organisations, encouraging individuals to learn and make decisions unaffected by personal history and agency. However, in the case of most educational organisations, that assumption cannot be made. Power within the educational bureaucracy is not distributed, and most schools would recognised that there is a clear hierarchy of power.

In British Columbia, Canada (site of the case study for this research), the hierarchy is clearly presented in the School Act (1997). The responsibility for education is given from the federal government to the provincial government. It is then assigned, at the provincial level, to the Ministry of Education, Skills and Labour, which allocates it to the local school boards. They in turn hire a superintendent who further allocates it to school-based principals who distribute it within their sites (eg. vice principals, department heads, and teacher-specialists).

Initially, it appears that responsibility and control for education are passed like a hot potato down the line. However, research into bureaucracy suggests that substantial portions of control are retained and increasing amounts of responsibility and diminishing small bits of control are passed along. Therefore, within the British Columbia (BC) educational system, elements of control are retained by many along the line, creating layers upon layers of
stakeholders who work hard to maintain the power they have been given. By the time the
distribution of power reaches the end of the hierarchy, individuals actually doing the work
are often left with only enough power to stop something but not to start anything new - a
negative form of power (Handy & Aitken, 1988). An example is an action such as teachers’
strike. During a strike the schools may temporarily close, but the rest of bureaucracy rolls
on.

Bureaucracy (Weber in Meyer, 1985) is based on a theoretical model (an idealised
form of organisation) which attempts to offer order and efficiency in the management of a
group’s actions. It is built on the fundamental principles of a hierarchy which begins with
power at the top and has a direct effect on the power of the group directly below it. It is
understood that those in a management position within each layer of the hierarchy will
follow uniform rules and procedures. It is also understood that each group within the
hierarchy has a specific jobs to do and the authority to do its specific job. All of these
principles are clearly written down and record the procedures each manager is to follow
(Meyer, 1985). In the case of the BC Ministry of Education, Skills and Labour, these
principles are stated in the School Act, and copies of this document are located in offices at
every level of the hierarchy, right down to the staff rooms of local schools and online on the
WEB.

Therefore, it would seem that the diffusion of innovation within a bureaucracy is
effected by more than just the processes and categories of adopters described by Rogers
(1983). Ancona and Caldwell (1990, p. 174) suggest that groups have a tendency to work
from a distributed power base, meaning that daily goals and actions are determined by the
group while the actual project is presented from the top end of the organisational hierarchy.
While this can encourage greater distribution of decision making, it assumes that the group
accepts the responsibility for the task and is capable of “... find[ing] support for its ideas
within the organization.” Constructive dialogue among group members is required for this
support, and as stated above, has the potential to be limited or restricted by the
communication among various group members.

Other issues, personal power and the distribution of power within an organisation,
also affect the diffusion process. For individuals to act differently from what is stated in the
policy of the bureaucracy, it appears that two factors are central:

- **Personal power** (agency) reflecting an individual’s perception of her/his own power
  within the organisation, and

- **Distribution of power** reflecting both the resource power and position exhibited by
  individuals within the organisation - resource power being the control of organisation
  assets while position power is the role or authority given to an individual by someone
  higher up the bureaucratic hierarchy power (Handy & Aitkin, 1988).
Elgar (1995) suggests other essential elements affecting an individual's willing to adopt change:

- peer pressure within the system
- merit pay for either innovative work or traditional work, depending on the organisation
- the politics of the organisation (perceived penalties for inappropriate actions).

Recognising the existence of these factors is critical to reforming education practices and helping schools become organisations for learning.
Schools as Organisations for Learning

While one might assume that schools, whose focus should be on learning, would naturally be learning organisations, it is a theory of this research that they are not.

Scardamalia and Bereiter (1994) describe schools as having the potential to become knowledge-building communities, thereby becoming capable of promoting reformed educational practice and encouraging knowledge-building. By using system thinking, activity theory (Section A) could be incorporated into the school experience, allowing all learners (students and educators) to grapple with activities to develop personal understand and demonstrate their learning and developing schools as organisations for learning.

Unless all members of the organisation have the right to learn and engage in a reflective process for decision making, they cannot give those rights to others. “You cannot give rights to anything you do not have the right to yourself” (K. Crawford - personal communication, April 22, 1997). Therefore, it appears that learners cannot learn until teachers and administrators have been given the right to learn as well. All individuals must have full membership rights and responsibilities in organisations for learning.

The concepts behind organisations for learning are based in the literature of learning organisations (Argyris and Schon, 1978; Senge, 1990), diffusion of innovation (Rogers, 1983), activity theory (Leont’ev, 1981; Vygotsky, 1978, 1981, 1986), and learning theory (Brown, 1994; Scardamalia & Bereiter; and others). This literature base allows for the development of a systems view, revealing a conceptual tie between learning organisations and knowledge-building communities and helps to generates the revised theory for this research, developed from the literature on theory and assumption (Argyris, 1992; Rogers, 1983; Senge, 1990). Schools must become organisations for learning capable of creating learning environments promoting innovative practice and encouraging knowledge-building for all learners (educators and students).

Compared on Figure 7, traits found in knowledge-building communities and learning organisations begin to provide a model on which educational organisations could develop. Three disciplines emerge: (1) personal mastery; (2) an environment promoting innovative practice; and (3) holistic thinking. Theoretically, it appears organisations for learning are possible. However, currently most schools are limited learning organisations (Argyris & Schon, 1978).
Figure 7. Disciplines essential for organisational learning based on disciplines for knowledge-building communities and learning organisations.
Schools function within a large bureaucracy and operate with limited amounts of information which the bureaucracy shares with them. They then create smaller groups (individual classrooms, etc.). Typically these smaller groups react with even smaller pieces of information which they have been given. Learners, a smaller group again, become socialised into single loop learning activities by observing the organisation through the actions of teachers who typically do not teach or model the skills required for good dialectic or quality inquiry because they do not use these skills in their organisational operations.

Argyris and Schon (1978, p. 119) suggest organisations, such as schools, set out to design goal statements

... calculated to achieve intended objectives. But when we look at what actually goes on in organisations ... we find much that is counter-productive to the original design. Moreover, the counterproductive activities are just as obvious and commonplace as the ones that are more nearly congruent with the original designs.

A possible explanation for this lies in activity theory itself. Reviewing Figure 5 from Section A, needs and goals are the result of progressive grappling with problems through activities. Therefore, it is not surprising that counter-productive activities occur in a system where an individual’s needs have not been considered in the formation of goal statements. When innovations or changes come into schools, individuals rarely are encouraged to engage in a decision making process and tend to respond to change by immediately rejecting it, ignoring it, or assuming it to be yet another fad or trend that will disappear (Argyris, 1993, 1992; Fullan, 1991). Their individual goals are NOT being taken into consideration. Adoption of an innovation is all too often left to be a by-product of participant exposure to the innovation’s existence.

Activity theory (Figure 5) would suggest when an individual’s needs are not met, the goals for individuals change to reflect the perceived goals of the organisation. These goals tend to be subordinated to the constraints inherent in the organisational structure and ignore an individual’s needs, personal history, and social interactions. Crawford (personal communication, May 22, 1997) suggests that when an individual’s personal needs and goals are not accounted for, the goal of an individual becomes externalised with a focus on fulfilling externally imposed tasks. Surface approaches to learning explain a compliance to socially approved rules and procedures without critical reflection or reinvention.

A key assertion of Argyris and Schon’s (1978, p. 4)) is “... organizations tend to create learning systems that inhibit ... learning that calls into question their norms, objectives, and basic policies.” Because individuals work within the environment created by these organisations, it is not surprising that much activity defaults to common safe behaviour controlled by intangible artefacts seemingly developed by the organisational structure. These intangible artefacts are rarely expressed in the organisation but appear to be ubiquitous
throughout the system, affecting the behavioural world (Argyris & Schon, 1978) in which the individuals function. They seem to have as much impact on individuals as the more tangible artefacts such as organisational memory and physical environment. This behavioural world appears consistent with the socio-cultural influences suggested by Vygotsky (1978, 1981, 1986; and others).

The following exercise, viewing schools as organisations, demonstrates a set of assumptions based on current educational practice and reinforced by the findings from this research (Chapter Five).

- Schools are organisations with a set of goals to encourage and support learning and higher order thinking.
- Research suggests learning is an active process; it cannot "be done" to an individual;
- Therefore learners (all members of the school community) must be active participants in the organisation's process in order to learn.
- However, learners traditionally have no input into the organisation's goal statements.
- The organisation is generally unaware of the learner's specific needs and, therefore, cannot reflect the needs and goals in the goal statements.
- However, organisations must become aware of all its members and encourage their participation in ongoing goal statements and activities because
  - If learners are allowed to actively participate, they will actively learn.
  - If learners learn, the organisation can learn.
  - If the organisation does not learn, the learners cannot learn.
  - Therefore, schools cannot formulate goal statements until they actively learn with their members.
  - Therefore, learning is not encouraged or supported in non-learning organisation schools.

**Conclusion**

Schools must become organisations for learning in order to create an environment which promotes innovative practice and encourages knowledge-building.

**Figure 8. Assumptions about schools.**

While this set of assumptions probably appears simplistic, it does form a mental model which is unfortunately similar to many learners'1 experiences with traditional education and confirmed by dissatisfaction expressed by many with the current education

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1 (Learners being all members of the organisation - students, teachers, support staff, administration, parents, etc.)
The actual practice observed in this research and presented in Chapter Five confirms this conclusion as well.

The literature (Section A & B) allows initial theory to be built suggesting an environment that might support learning. Figure 9 suggests attributes that appear necessary for knowledge-building in an organisation supporting learning.

**Figure 9.** The importance of continuous dialogue on learning attributes, including the effects of agency and conceptual understanding.

Figure 9 is elaborated on further in Chapter Five (Section B).
Summary

Current educational practice is being questioned by all parts of contemporary society, including elements within the educational organisation itself.

However, the ability to effect change within the educational organisation and respond to the concerns is limited due to identifiable behaviours which block organisational learning. Until schools learn how to learn, they will not be able to respond constructively to difficult problems, and the status quo will be maintained.

Research Questions

(2B1) Are schools capable of becoming learning organisations?
(2B2) Can a balance be found between what is known about learning and the actual practice dictated by standardised curriculum and evaluation?
(2B3) Can schools develop workable mental models to construct organisations for learning?
SECTION C - A VIRTUAL COMMUNITY OF LEARNERS: THE POTENTIAL FOR REFORMED EDUCATIONAL PRACTICE

No network connection at all - zero bandwidth - makes you a digital hermit, an outcast from cyberspace.

Introduction

This research argues that schools could be organisations for learning if they were to develop environments promoting innovative practice for all their members and focus their attention on knowledge-building. A question then arises; could these organisations for learning be situated in a virtual environment supported by computer conferencing?

Theoretically, the answer appears to be yes. Situating a community of learners (Brown, 1994; Rogoff, 1994; and Scardamalia & Bereiter, 1994) in a computer mediated conferencing environment seems consistent with the characteristics and promises described by researchers of computer-supported telecommunications. Newman (1990, p. 115) suggests the ... concept underlying computer conferencing systems is the idea of a conversation as a shared object for a group of people. These conversations can have a variety of purposes, but in all cases a sense of community arises from the interactions by virtue of the shared common history.

<table>
<thead>
<tr>
<th>COMPUTER LEARNING ENVIRONMENT</th>
<th>ORGANISATION FOR LEARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>• new pedagogical dynamics</td>
<td>• learner allowed to take charge of learning</td>
</tr>
<tr>
<td>• changing roles</td>
<td>• apprenticeship</td>
</tr>
<tr>
<td>• more student control</td>
<td>• intentional learning</td>
</tr>
<tr>
<td>• new social dimension in classroom</td>
<td>• teachers as role models of learning - responsive guides to student discovery</td>
</tr>
<tr>
<td>• flatten traditional hierarchy</td>
<td>• learning on need-to-know basis</td>
</tr>
<tr>
<td>• writing for authentic purpose (understanding with distance audience)</td>
<td>• learners as self-reflective capable of critical inquiry</td>
</tr>
<tr>
<td>• development of virtual community</td>
<td>• knowledge-building discourse</td>
</tr>
<tr>
<td>• potential for multiple cognitive approaches to problem solving via cooperative / collaborative learning potential</td>
<td>• community of learners</td>
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<td></td>
<td>• knowledge-building community</td>
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<td></td>
<td>• construction of collective knowledge</td>
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<td>• collaborative knowledge-building</td>
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Figure 10. Comparison of characteristics of computer supported learning environments and organisations for learning.
A virtual environment has the potential for educational activity as the very nature of online communications (at this time) is text-based and "... knowledge is the currency of value" (Rheingold, 1994, p. 69). A premium is placed on knowledge that is artfully crafted and logically and eloquently presented; the reward being response and extended communication.

Educators have been lured to the online computer environment by its promise to facilitate reformed educational practice and to allow improved social interactions. Researchers (Feenberg, 1995; Harasim, 1990; Hiltz & Turoff, 1982; Mason & Kaye, 1990; Riel & Levin, 1990) identify characteristics of the online environment, such as those presented by Bates (1984, p. 223). "New technology promises: a wider range of teaching functions and a higher quality of learning; lower costs; greater student control; more interactions and feedback for students."

Five distinct advantages for learners are consistently promoted. The first advantage is the promise of creating "... new social dimensions in classrooms [that will] blur social distinctions, create new pedagogical dynamics, and change the roles of both teachers and learners" (Bruce, Peyton, & Batson, 1993, p. 5-6). This would allow learners to have greater access to teachers and could cause the traditional role hierarchy of teacher/learner to flatten, creating more collaborative learning environments.

The second promise is the use of writing for authentic purposes. Learners could use their writing skills for a variety of academic and personal reasons for direct communication with peers. As computer supported communications are primarily text-based, a premium is placed on clear writing that can be understood by a potential distance audience. Because feedback from peers is well promoted in the literature as a method to improve written expression (Cohen & Riel, 1989), online correspondence is a logical vehicle to assist in the development of written expression.

A third advantage is the immersion of learners in a virtual community which is developed through the sharing of tasks and common experiences. Participants are able to develop an online persona and work together to form an online relationship. The concept of a community of learners is consistent with the literature presented in Section A (Brown, 1994, 1994; Rogoff, 1994).

Fourth is the opportunity for collaboration in projects and tasks, using the shared environment of computer conferencing for cooperative learning activities. The potential exists to work asynchronously on tasks and pool the resources and skills of participants, connecting subject experts with novice learners (Lave & Wenger, 1991) and allowing the group to build knowledge together (Scardamalia & Bereiter, 1994).

The fifth attribute is the ability for learners and teachers to work asynchronously in the place and time of their choosing. This allows participants with different work schedules or in different time zones to participate equally, without the constraints of time or travel (Harasim, 1990).
In recent years, researchers (Rheingold, 1993, p. 63 and others) have further observed that "... computer-mediated communications can break down hierarchical and departmental barriers, standard operating procedures, and organizational norms [rank, power] ...." Turoff, in 1976, cited in Rheingold (1993, p. 113), predicted that "... the ultimate possibility of computerized conferencing is to provide a way for human groups to exercise a collective intelligence capability."

These characteristics appear capable of supporting an organisation for learning, and the promise of allowing learners to collaborate with others and transpose knowledge among a group is at the centre of contemporary research (Broussseau, 1992; Scardamalia & Bereiter, 1994). The virtual environment, as it is described, would allow learners to de-contextualize the learning, work with it collectively (one-to-one or one-to-many), and re-structure it in a group context online. These skills are critical for higher level cognition in both education and business applications. However, research (Walther, 1992; Walther & Burgoon, 1992) is beginning to question the promises and potential by looking at long term, actual practice.

Walther conducted a critical review of previous research into computer conferencing, taking a relational communication perspective (examination of the functional and social factors affecting interactions).

He found much of the early research (Harasim, 1990; Hiltz, 1990a) into online activity was conducted in short term, task specific interactions. For example, computer conferencing was used as a small portion of a face-to-face course with the online interaction being sustained for only a few weeks; hardly time to test group dynamics or establish group intelligence (McGrath, 1990).

While research on the long term effects that these new tools have on the education system is limited, educators must begin to recognize that historically new tools and new media (eg. television and radio) have had a major impact on society and culture. As schools and academic institutions race to improve their hardware inventories and increase their connectivity and bandwidth, basic philosophical and pedagogical questions must be addressed as to how the new equipment can be used within the classroom and what the effect will be on learning. Steinberg (1994, p. 22) comments

There has been little discussion ... of exactly how the new media [the Net] will affect our society. This is frightening because new forms of communication have historically changed the social fabric in profound and nonobvious ways. The shift from an oral society to a literate one, for example, led to a type of linear and abstract thinking that was previously unknown. Communications theorist Neil Postman has argued that the advent of television has shaped how we think by forcing our discourse to resemble entertainment. In his book, Amusing Ourselves to Death, Postman posed three questions about television: What kinds of conversations does it permit? What are the intellectual
tendencies it encourages? And what sort of culture does it produce? I pose
these same basic questions of the Net.

While Steinberg was addressing the issue of the Net specifically, the questions posed are
relevant to the general discussion of computer conferencing and computer hardware and
software applications in learning institutions.

Popular authors (Stoll, 1995, Silicon Snake Oil) have an easy time criticising
fledging online activities, focusing on WEB gambling and cyber sex, overlooking Turkle’s
(1995, p. 10) reminder that “In the real-time communities of cyberspace, we are dwellers
on the threshold between the real and the virtual, unsure of our footing, inventing
ourselves as we go along.”

Negroponte (1995), recognising the degree to which computer technology is
already embedded into our culture suggests that computers are not separate from our lives,
they are part of how we live our lives and the choices we make.

As with the development of any new tool, the appropriate uses of
telecommunications and the information highway are still evolving. “...since the
technology is still embryonic, it’s quite possible that the real uses of an information
highway will be quite different from what we are looking at today” (Bruckman, 1994, p.
46).

Assuming this is the case, education could play a pivotal role in encouraging and
promoting innovative uses of technology as technology may provide the timely tool to
support innovative educational practice.

Potential of Computer-based Education Environment

Traditionally, formal education has placed a premium on a learner’s memory; value
being placed on rote learning and the regurgitation of teacher directed information. Now,
it appears that technology (Internet, CD-ROMs, software simulations) has widened the gap
between what teachers can direct with what learners can discover. Some educators are
beginning to realise that it is “... simply impossible to be a knower any longer” (Spender,
1995, p. 102); at best individuals can be informed users of appropriate applications and
information. The concept of teachers knowing all there is to know about a subject area is
now quite impossible, and today’s learners can purchase additional memory for their
computers while focusing their attention on learning to access and use information rather
than memorising prescriptive information. These changes are consistent with knowledge-
building and the view of education being a rigorous learning activity.

A major concern is whether the educational bureaucracy can change its traditional
methods and incorporate the potential afforded by the new technology into its curriculum
designs.
Over the years, groups of educators (Australia, Canada, and the USA) have attempted to shift from the traditional instructionist model of education (learning directed by the teacher) to a more constructivist model (learning built / constructed by the learner). The constructivist model places teaching subordinate to learning, and views that it is the task of the staff to serve “… learners’ needs rather than impose teacher dominance” (p. 115).

This constructivist view supports the notion of brocolage, which encourages the building of “… scientific theories by pottering around with natural objects in various combinations. A bricoleur, in this sense, is a kind of intuitive technician, who plays with concepts and objects in order to learn about them” (Rheingold, 1991, p. 374 - 375).

Papert (1980, p. 173) suggests “The process reminds one of tinkering; learning consists of building up a set of materials and tools that one can handle and manipulate. Perhaps most central of all, it is a process of working with what you’ve got.”

Rheingold (1991, p. 388) adds

Cognitive simulation, mental model-making, is one of the things humans do best. We do it so well that we tend to become locked into our own models of the world by a seamless web of unconscious beliefs and subtly moulded perceptions. … computers are model-making tools par excellence … .

This belief is well supported by observations of learners actively engaged in LOGO and LEGO-LOGO projects, tinkering away as Papert envisioned. Applications such as LOGO create work environments that allow for the construction of various solutions to problems. Placed in the hands of educators committed to the constructionist model of instruction, computers could be powerful tools in the reform of educational practice. However, if the new technology is used by the same old education system, nothing will have changed but the price tag on the new tools (Stoll, 1995).

In actual practice, the use of new technology by traditional educational institutions has been disappointing. Research (Scardamalia & Bereiter, 1994; and others) shows word processors used as type writers and the Internet as a replacement for snail mail pen pal messages. Many computer games or interactive software packages are not actually interactive but prompts by designers to train users along a particular form of logic.

Turkle (1995, p. 70) cautions of a “seduction of simulation.”

Games such a SimLife teach players to think in an active way about complex phenomena (some of them ‘real life,’ some of them not) as dynamic, evolving systems. But they also encourage people to get used to manipulating a system whose core assumptions they do not see and which may or may not be ‘true.’

This caution is not to be taken lightly. Learners must acquire the higher order thinking skills necessary to evaluate information and build assumptions based on sound reasoning; otherwise learners will run the risk of learning to “… trivialising human life…” (Turkle, 1995, p. 105) when the only cost for a poor assumption is resetting the game.
There also is the fear that simulations make events more compelling than real life. They are faster and potentially more fun. CD-ROMs can bring learners time lapse photography of plants growing, seasons changing, animals developing, and learners do not have to wait. Society runs the risk of allowing simulations to devalue direct experience. Virtual field trips can always guarantee good weather, the exact adventure, and a safe environment, controlling the level of excitement, entertainment, and risk.

While the negative issues surrounding the new uses of computer technology abound, educators are in a prime position to assess the good and the bad, making decisions about curriculum revision and instructional delivery. However, educators, themselves, need to learn to use the new technologies and rethink traditional delivery practices in order to make informed decisions that will affect their learners. As one program assistant in the case study for this research astutely notes "Teachers are products of their own system; they have always been taught and have never had to learn" (Facilitator 3, Online Interview, 1996). Having a learner sit in front of a computer playing SimLife for hours seems as poor an instructional design as having the same learner sit in front of a teacher for a similar time period. Spender (1995, p. 144) notes that if computer technology is used effectively, it

... will allow students to play a much greater part in designing their own learning environment. The shift will be 'from scheduled classes to individualized programs; from teacher-controlled to learner-controlled; from printed text to electronic materials; from memorizing to problem solving and decision making.' The orientation will move from content to competence.

Therefore, a potential application of computer technology could be found in distance education.

Computer-Mediated Distance Education

World-wide, computer supported learning opportunities are increasing. Educational institutions (K-12, tertiary, and commercial re-training centres) are adapting computer technology to deliver programs, and independent groups are placing alternative learning options on the WEB. Through these adaptations and evolving applications, telecommunication technology (computer hardware and software) is being developed and improved, connecting learners and educators and providing innovative educational experiences. These experiences build on the strengths inherent in the environment and create efficient and cost effective opportunities for real time interaction between participants.

One such learning experience is the New Directions in Distance Learning (NDDL) program in British Columbia, Canada, the site for this research. NDDL started in 1993 as a partnership between the Open Learning Agency of British Columbia and the provincial
Ministry of Education, Skills and Labour (Chapter Four). In its pilot year, learners from seven geographically remote, small high schools throughout the province were connected electronically with teachers in various parts of the province. Students and teachers used conferencing software (SoftArc First Class) for academic and administrative communications, the transfer of assignments and marks, the distribution of assignments, and informal chat. Regularly scheduled audio conferences were held using a PolyCom speaker phone to provide real time interaction. Participant interaction was further supported with a digital tablet and interactive software (Vis-A-Vis and Timbuktu). Based on the reported success (determined by evaluations completed by learners, parents, site facilitators, mentors, and project managers), NDDL expanded to include 12 sites in its second year and 30 sites for its third year. The NDDL instructional design is built around the promises of computer supported conferencing presented earlier in this section.

The NDDL experience, as reported in this research, shows the online environment is potentially well-suited to the group negotiation of tasks and the process of scaffolding. The use of user friendly software permits the creation of group conferencing areas and private e-mail, allowing learners, teachers, and peers to communicate either in group communication or privately. However, the software alone cannot ensure that communities will form, or if they do, that interactive communications can be sustained.

Facilitation strategies need to be developed by mentors, or more experienced learners, if rich, social interaction among participants is to be developed (Crichton, 1993; Mason, 1991). While some literature on computer conferencing (Harasim, 1990; Hiltz, 1990b) suggests that almost magically the potential of the medium will be realised as people join virtual conferences, research into actual practice, particularly into practice sustained over long periods of time, suggests the opposite (Ancona & Caldwell, 1990; Bikson & Eveland, 1990; Galegher & Kraut, 1990a; McGrath, 1990).

Moderating strategies, such as those proposed by Mason (1991), are required to weave individual participants’ thoughts together and connect the learning, recontextualising ideas. Reluctant learners must be encouraged to participate, moving them from “lurking” around the fringes of the conferences (reading the notes posted by other but not contributing themselves). Moderation activities such as these require retraining educators so they can acquire the new skills and begin to rethink curriculum, avoiding the shopworn instructional methods described by Scardamalia and Bereiter (1994) later in this section.

Researchers into human communications (Hiltz, Johnson, & Turoff, 1986; Trevino, Lengel, & Daft, 1987; Walther & Burgoon, 1992) suggest that current online environments are “lean” and socially impoverished; a condition they suggest limits sustained participant interaction. Trevino, Lengel & Daft (1987) found that often participants’ online messages reflected less empathy for other participants, a greater sense of anonymity, and less concern about the norms of standard communication and social
interaction. The later is reflected in more flaming or uninhibited, hostile speech and "... greater self-absorption versus other-orientation..." (Walther & Burgoon, 1992, p. 53), resulting in messages that were abrupt, more task oriented, and impersonal (Hiltz et al., 1986).

It is interesting that years after the findings of Hiltz et al., Walter and Burgoon note basically the same type of messages occurring. They observed students enrolled in an online course and focused their study on how groups formed in the virtual environment, observing how people used the technology rather than what the technology was capable of doing. They offer three main theories: (1) social presence, (2) social context clues, and (3) media richness.

Walter & Burgoon (1992, p. 52-53) explain

Social presence is ... the degree of salience of another person in an interaction and the consequent salience of an interpersonal relationship. Social presence is said to be a differential property of communication media: The fewer channels or codes available within a medium; the less the attention paid by the user to the presence of other social participants.

Social presence theory affects online interaction due to the nonverbal, text-base nature of the medium. Computer supported communication

... is said to be extremely low in social presence in comparison to face-to-face communication. When social presence is lower, messages presumably are more impersonal. The CMC [computer mediated communications] literature ... suggests that because the nonverbal codes are generally those that carry relational information, it is the loss of this particular information in written-only CMC that causes unemotional or undersocial communication (p. 52-53).

Consequently, it appears that it is a medium which is not inherently suitable for conversations in which individuals are attempting to develop personal relationships or establish "... intimacy, which is comprised of affection, immediacy, receptivity, trust, and depth [familiarity]" (p. 57). The impact of social presence in the online educational environment is immense. If learners and their instructors are to develop and sustain a rich, interactive discourse, intervention strategies must be employed to overcome the social presence effects. For example, online instructors must be aware that some topics or types of discussions might be sustained online only after they have been introduced and explored via another medium. These strategies will be discussed further in Chapter Five.

The second theory, social context cues, looks at the effect that aspects of the "... physical environment that define the nature of the social situation and actors' relative status" (p. 53) have in a non-physical, virtual environment. Without visual access to the physical clues, participants are not able to easily determine age, ranking, position, gender, race, nationality, etc. Therefore, participants develop social understanding through text,
often flattening the classroom hierarchy and changing the social dynamics of the educational environment (Harasim, 1990; Hiltz & Turoff, 1982; Riel & Levin, 1990).

Consequently, time and opportunity must be given for all online participants to establish their virtual selves (Turkle, 1995). Course designs must adapt to the changes in social hierarchy to avoid the hypocrisy of encouraging a flattened social order only to evaluate learner performance in a traditional authoritarian manner.

Media richness, the third theory, suggests that the media can be rated by the "... bandwidth or number of cue systems available" (Walther, 1992, p. 56-57) to the user. ... face-to-face communication is touted as 'richest,' given the availability of immediate feedback, the number of cues and channels utilized, nonverbal (facial and oral) backchanneling cues, and personalization and language variety. Computer-mediated communication is a very 'lean' channel, because no nonverbal cues are present.

Participants in virtual learning environments, therefore, need a variety of medium in which to work and establish their roles and identities. The type of media must match the purpose of the message if communication is to be successful - mutually understood. Based on the three theories presented above, contingencies must be developed to determine which medium is appropriate (Thompkins, 1993; Trevino, Lengel, & Daft, 1987).

Walther (1992, p. 57) suggests

These contingencies pertain to the ambiguity or equivocality of the intended message or messages one wishes to send and the richness of the media that may convey them. When messages are very simple or unequivocal, a lean medium such as CMC is sufficient for effective communication. Moreover, a lean medium is more efficient, because shadow functions and coordinated interaction efforts are unnecessary. For receivers to understand clearly more equivocal information, information that is ambiguous, emphatic, or emotions, however, a richer medium should be used. In this way immediate feedback from auditors - both verbal and nonverbal - is available to speakers in order to make their messages more clear and enhance audiences' understanding.

In the construction of virtual environments, care must be given to the type of media designed for specific applications. While computer conferencing is well suited for many purposes, "... it would be less appropriate to use this channel for such highly personalised interactions as are needed in resolving disagreements, getting to know someone, or bargaining and negotiating ..." (p. 58).

This effects the communications of an organisation situated online. Argyris, (1992) and Senge (1990) suggest the key to both organisational inquiry and organisational dialectic are communications that are valued, elaborated on, and encouraged by both the organisational hierarchy and its members. These two elements are at the heart of organisational learning. While it is often assumed that members in an organisation talk to
each other regularly, it can not be assumed that it is happens with all members or that the conversations are valued or supported. The workspace environment (Senge, 1990) plays a critical part in the communication process, encouraging or preventing conversations to occur, and the design of workspace is an integral part of the organisational design. It has long been believed that conversations over office photo copiers and during coffee breaks are valuable interactions as they tend to blur the distinctions between jobs and often create different social dynamics. Finding the metaphorical photo copier in cyberspace or creating a virtual coffee break is a challenge for sustaining organisation dialectic online.

Caladine (1993), after reviewing the literature of the overseas experience in non-traditional delivery of higher education courses, recognises these challenges and notes some general observations:

1. ... alternative modes of delivery ... must be driven by educational principles, rather than the availability of technological capacity; 2. As the novelty of the technological delivery wears off, to be educationally effective the delivery technology needs to increase in interactivity; 3. Staff development, the selection of media and instructional design are vital and necessary to educational effectiveness (p. 4-5).

Research (Crichton, 1993; Walls, 1994) into the use of computer supported distance learning confirms these three observations, stressing the link between quality instruction and positive learning. The novelty of computers, alone, cannot sustain learning over long periods.

Elaborating on each of Caladine’s points, creates a frame for discussing educational practice online. Point one supports the notion that the status quo in teaching cannot simply be modified to match an appropriate piece of hardware or software and then delivered online. Sound principles of educational practice must drive the use of innovative pieces of technology. The technology is flexible enough to allow learners to negotiate their tasks, but teachers must allow it to happen.

The second point, increased interactivity, is well supported in the literature concerning the theories of social presence, social context cues, and media richness. Interaction must be sensitive to the users’ needs and reflect an awareness of the limitations imposed by the medium.

Point three, the role of staff and curriculum development, while obvious for success, is often overlooked in the race to use the new technologies in educational applications. If staff bring traditional teaching methods and standard lessons and activities into the new environment, the promises of computer supported learning will not be obtained. The old saying, if it walks like a ducks and quacks like a duck, it probably is a duck will carry over into the virtual environment. If the teachers teach in a traditional model, use traditional materials, and assess learner performance in the traditional manner, it probably is traditional education, delivered online.
McIsaac (1993, p. 219-232) comments

Distance education technology can be used to enhance local social, educational, and political goals. It can provide learning resources in remote locations to those economically or physically unable to participate in traditional educational settings. On the other hand, education can simply provide resources that maintain the status quo and that perpetuate economic and social injustice as well as the reproduction of power structures and world views. What is needed in educational technology and distance education is a continuous, systematic examination and critical questioning of the underlying assumptions and power relationships that guide the use of technology.

Critical questioning of the design of computer supported distance education is essential. While many researchers and proponents of online instruction (Harasim, 1990; Hiltz, 1990a & b) use the metaphors of the existing system to explain the new system, there is a danger of importing the inherent problems of the old into the new. An example of this is use of the Hiltz’s (1990a) copyrighted term the "virtual classroom" to contrast the "traditional classroom." Hiltz developed this term to illustrate the similarities between computer supported learning environments (virtual classroom) and those physically located within traditional educational institutions. She developed hypothetical floor plans of virtual rooms, which she assigned traditional names such as library, office, staff room, etc., in an attempt to illustrate the learning potential within the online environment.

While initially this may have assisted some educators to understand computer conferencing, over time it may have limited the potential of new environment to rise above the confines of labels which were used to define traditional practice.

Kofman and Senge (1993) suggest that we can “... see language as a set of labels that describe a preexisting reality, or as a medium in which we can articulate new models ...” (p. 52). If new models are not created, the status quo will be scanned¹ online, and the potential for innovative practice stalled or severely limited.

**Technology and the Status Quo**

Weir (1992) notes that "An electronic network can provide a framework for encouraging change within a complex social, interactional setting." However, she cautions that while "Technology can invite change ... [it] does not, alone, ensure it."

The past ten years of educational practice with technology supports Weir’s caution. "... the phenomenon of reframing innovations to recreate the familiar is ... commonplace" (Scardamalia & Bereiter, 1994, p. 265). Teachers have demanded drill and practice

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¹ Process of digitising print materials so they can be used by computers. This allows one to copy a document in its original form and import it into a software application.
software and placed computers into the cycle of work stations through which student rotate.

Too often word processors have been used as typewriters, encouraging students to retype work generated by pen and paper and overlooking the collaborative potential of the networked lab or the drafting possibilities of writing online.

... one sees all manner of powerful technology (Hypercard, CD-ROM, Lego Logo, and so forth) used to conduct shopworn school activities: copying material from one resource into another (eg., using Hypercard to assemble sound and visual bites produced by others) and following step-by-step procedures (eg., creating Lego Logo machines by following steps in a manual).

While these often appear to produce sophisticated, almost professional-looking products, the cognitive value of these activities is questionable, and the potential for knowledge-building missed. Therefore, the challenge is determining how schools can use technology for improved, not shopworn, learning activities and stimulate knowledge-building.

"Nobody wants to use technology to recreate education as it is, yet there is not much to distinguish what goes on in most computer-supported versus traditional classrooms" (p. 265).

The fear of recreating the status quo online is at the heart of this research. Among the major questions is whether educational change occurred in one specific online environment, the NDDL Law 12 course, allowing the shopworn strategies to be discarded and the promises of computer conferencing to be a reality in actual practice. When the various aspects of online learning are viewed together in Figure 11, one begins to see how difficult integrating the potential of computer supported learning into actual practice can be. The potential for computer supported learning is shown as the entire pie while issues affecting it are shown as sections, suggesting only a small area is available for innovative for innovative practice.

![Diagram](image)

**Figure 11.** Potential for innovative practice in computer-supported learning.

Diagrams such as Figure 11 are employed by Arygris (1992), Senge (1990), and Mink, Owen, and Mink (1993) to illustrate the interrelationship of concepts and to help clarify the challenges of affecting change in an integrated system such as education.
An issue that continues to arise in schools is how to fund technology purchases and supply the requisite upgrades and bandwidth. Possibly this single issue, finance, will cause schools to reflect on traditional practices and weight them against the economics of technological projects situated in potentially less expensive innovative practice.

Summary

The literature is rife with promises citing the potential for computer conferencing to reform educational practice and offer a quality environment have higher order cognitive activities. Current research is questioning these claims by identifying limitation within the medium which have the potential to affect long term activity in the virtual environment.

However, it would appear that many of the promises of computer conferencing could create a learning environment that is compatible with the reformed educational practice. Research into long term actual practice in a virtual environment is essential to determine whether the promises can be realised in an educational setting.

Research Questions

2C1 Can the integration of technology change the roles for both educators and students?

2C2 Can a virtual community of learners be formed to share tasks and common experiences?
CHAPTER THREE

RESEARCH METHODOLOGY

According to a certain scientific theory you can only be sure of the existence of what you yourself have experienced.
- Peter Hong - Smilla's Sense of Snow

Initially, this research was undertaken to explore a set of assumptions which were based on personal experience and observation of the site for this research, the New Directions in Distance Learning (NDDL) program (Chapter Four). This research was begun based on the assumption that a community of learners would be established within the computer mediated communication’s environment, and that this community would negotiate learning opportunities that would encourage knowledge-building. Knowledge-building is discussed in Chapter 2 (Section A).

A research design, based on Goffman’s (1974) theory of frame and code analysis and situated in action research (Argyris, 1992; Argyris & Schon, 1978; Crawford, 1995b), was developed to test these assumptions. Data was collected, and the initial codes, which had been gathered from previous research in the field and an initial review of the literature, were used as a screen to sift the various pieces of information into specific frames.

This process revealed a gap between the initial assumptions (espoused theory) and the actual practice (theory-in-use). Using Argyris and Schon’s (1978) theory of double loop learning, the first assumption was modified, and a revised espoused theory was developed: schools must become organisations for learning capable of creating environments promoting innovative practice and knowledge-building for all learners (educators and students). This theory is based on the work of Brown (1994), Scardamalia and Bereiter (1994), Senge (1990), Walls (1994) and others, which is discussed in Chapter Two.

The development of the revised, espoused theory caused a redefining of the frames and codes and a return to the literature in the field. An explanation of this research approach is presented in this chapter in four sections:
1. Research Design - a situation of the design within the ethnographic research field;
2. Development of Research Frame - a discussion of the development of the frames and codes used to test assumptions / espoused theories;
3. Researcher’s Role - an explanation of the researcher’s relationship with the case study site; and
4. Methods and Ethical Concerns - a description of the actual process used to collect and make sense of the information in relationship to the frames and codes.

Continuous reference is made to Chapters Two (Review of Literature), Four (The NDDL Context: An Exploration of Actual Practice), and Five (Analysis of Key Issues).
Research Design

The design for this research is based on the empirical research tradition as it extends beyond theoretical (library-based) research by going into the field as a participant observer.

An ethnographic-inductive design (Goffman, 1956, 1974; Kellehear, 1993) was developed as it is effective for observations of social systems. This design allows for the development of a picture of the online LAW 12 society (community of practice). The following approaches were used to analyse and portray the social system:
1. observations of online communications and audio conference participation,
2. interviews with participants,
3. information collection from online the conference,
4. information collection from informants (peers, colleagues, management people),
5. study of the information collected (see 1, 2, and 3 above),
6. study of physical objects (technology, curriculum, student papers, and projects), and
7. study of organisational artefacts (handbooks, memos, promotional materials, and project communications).

The ethnographic-inductive design was particularly suitable for this research as it is less a prescriptive method and more a holistic approach (Kellehear, 1993). This allows the researcher to engage in systems thinking (Senge, 1990), focusing on a particular case study and gradually constructing a general social theory. Social theory, or grounded theory, can then be explored by further research.

The research starts with a review of literature to develop a "sense of place" (Kellehear, 1993, p. 21) within the existing research. Because this approach moves from case study to grounded theory, it allows for the incorporation of additional areas in which to place the work. In the case of this research, the modification of the first theory prompted a search for possible causes. Action research strategies (Argyris & Schon, 1978; Crawford, 1995; Lomax, 1989) were employed, focusing on the study of organisational structure (Scardamalia & Bereiter, 1994; Senge, 1990) and personal agency (Mink, Owen, & Mink, 1993). Theory was then built from the social structure of the system being observed and compared to both the literature and actual practice.

The ethnographic-inductive approach allows for an evolving inquiry and is supported in the literature of action research (see references above). Argyris and Schon's (1978) work on double loop learning, testing of espoused theory and theory-in-use, is essential to this research design. After constructing theory from both the literature and actual practice, the principles of double loop learning were used to engage in inquiry with the various members in the case study and to encourage them to participate in dialogue (Argyris, 1992; Cazden, 1988; Senge, 1990; 1993). This
revealed essential themes and issues which were developed into frames and codes (Figure 12) and used to organise the data.

Issues such as the participants' perspectives of activities, individual statements about learning goals and course objectives, and interpretations of personal and academic success were major components of the initial design. Because it was assumed that much of the research information would be gathered during the informal chat sessions online, the researcher created an open conference with the NDDL conferencing software. However, a critical mass of online conversation did not develop (Chapter Four and Five), so specific questions were asked via private e-mail. Responses to the e-mail were then extended via additional e-mail, and additional questions were formulated. A discussion of the limitations and constraints of the online environment, which affected not only this research but participant activity in the NDDL project, is presented in Chapters Two (Section C) and Five (Section D).

Research questions were addressed to three groups within the case study (student-learners, teacher-mentors, and site based teacher-facilitators). These groups were expanded after recognising the impact that the Distance Education School (DES) principals, NDDL project team members, and members of the Ministry of Education (MoEd) had on the social and physical structure of the NDDL environment (Chapter Four and Five). Three general categories for analysis were formed prior to the research commencing: social interaction, social development, and knowledge-building (Figure 12). Initially these categories formed a frame for observing the conference.

| MENTORS | FACILITATORS |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| **SOCIAL INTERACTION**  | **SOCIAL INTERACTION**  | **SOCIAL INTERACTION**  | **SOCIAL INTERACTION**  |
| - power / social distinctions | - power / social distinctions | - power / social distinctions | - power / social distinctions |
| - change in teaching role | - change in teaching role | - change in teaching role | - change in teaching role |
| - dialogue | - dialogue | - dialogue | - dialogue |
| - interaction | - interaction | - interaction | - interaction |
| - intent -- will | - intent -- will | - intent -- will | - intent -- will |
| - needs | - needs | - needs | - needs |
| **SOCIAL METHODOLOGY**  | **SOCIAL METHODOLOGY**  | **SOCIAL METHODOLOGY**  | **SOCIAL METHODOLOGY**  |
| - scaffolding, ZPD | - scaffolding, ZPD | - scaffolding, ZPD | - scaffolding, ZPD |
| - staff development | - staff development | - staff development | - staff development |
| - continually expanding expertise | - continually expanding expertise | - continually expanding expertise | - continually expanding expertise |
| - collaboration | - collaboration | - collaboration | - collaboration |
| **KNOWLEDGE-BUILDING**  | **KNOWLEDGE-BUILDING**  | **KNOWLEDGE-BUILDING**  | **KNOWLEDGE-BUILDING**  |
| - higher level cognition | - higher level cognition | - higher level cognition | - higher level cognition |
| - learner diversity | - learner diversity | - learner diversity | - learner diversity |
| - collaboration | - collaboration | - collaboration | - collaboration |
| - group intelligence | - group intelligence | - group intelligence | - group intelligence |
| - community of learners | - community of learners | - community of learners | - community of learners |
| - negotiated assessment | - negotiated assessment | - negotiated assessment | - negotiated assessment |
| - external acquisition | - external acquisition | - external acquisition | - external acquisition |
| - internal processing | - internal processing | - internal processing | - internal processing |

<table>
<thead>
<tr>
<th>SOCIAL INTERACTION</th>
<th>KNOWLEDGE-BUILDING</th>
<th>SOCIAL METHODOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>- power / social distinctions</td>
<td>- higher level cognition</td>
<td>- scaffolding, ZPD</td>
</tr>
<tr>
<td>- change in learner role</td>
<td>- ownership of tasks</td>
<td>- staff development</td>
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<tr>
<td>- dialogue</td>
<td>- collaboration</td>
<td>- continually expanding expertise</td>
</tr>
<tr>
<td>- interaction</td>
<td>- active learning</td>
<td></td>
</tr>
<tr>
<td>- intent -- will</td>
<td>- negotiation of activities</td>
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<td>- needs</td>
<td>- community of learners</td>
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<td></td>
<td>- negotiated assessment</td>
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Figure 12. Categories for analysis framework.
It was also recognised that certain variables were inherent in this ethnographic design, and they formed assumptions reflected in espoused theory. These assumptions were based on research concerning personal agency (Crawford, 1995; Mink et al., 1993), organisational workscape (Senge, 1990), and personal history and organisational memory (Argyris 1992, 1993; Argyris & Schon, 1978; Vygotsky, 1978, 1986). The assumptions were framed into the following categories, and codes were developed.

<table>
<thead>
<tr>
<th>ASSUMPTIONS</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>Individual needs</td>
<td>Reason for joining NDDL</td>
</tr>
<tr>
<td>Individual goals</td>
<td>Personal involvement and commitment to NDDL</td>
</tr>
<tr>
<td>Participants' experience in the online environment</td>
<td>Previous history with technology</td>
</tr>
<tr>
<td></td>
<td>Feelings about working with computers (hardware &amp; software)</td>
</tr>
<tr>
<td>Personal history</td>
<td>The participants' previous educational experience, backgrounds, personal constraints - family, etc.</td>
</tr>
<tr>
<td>Workscape / physical environment</td>
<td>Effect of the work environment on participants (issues of technical expertise, gender, teaching experience, commitment to program, hours available, location, access, organisational memory, etc.)</td>
</tr>
</tbody>
</table>

Figure 13. Assumptions affecting individual participation in NDDL.

As stated earlier, a further assumption, prior to starting this research, was that a community of learners, consisting of all participants involved in the program, would be established online, and this community would negotiate learning opportunities that would encourage knowledge-building. This was based on the researcher's previous experience in the NDDL program (and other online learning environments) and the literature.

Evidence of knowledge-building was to be demonstrated by (1) learner tasks which extend or expand the standard curriculum offerings presented in the course material from the Ministry of Education and/or (2) learner participation in tasks and/or activities that elaborate on key concepts or issues. The encouragement, assessment, and evaluation of demonstrations of knowledge-building and the participants' levels of engagement and agency were to be of particular interest to this research. Findings are discussed in Chapter Five (Section B and C), and an explanation of learning communities and knowledge-building is presented in Chapter Two (Section A).
Frames drawn from activity theory (K. Crawford - personal communication, August 25, 1995; Leont’ev, 1981; Vygotsky, 1978, 1986) were used as a basis for coding each participant's task completion strategies.

The goal of this ethnographic-inductive research design was to establish an emic viewpoint or insider's point of view (Kellehear, 1993) about the development, maintenance, and process of learning within the online environment. The emic viewpoint allows information from a particular case study to form a general social theory, moving from induction to grounded theory.

This research does not attempt to provide a prescriptive list of activities for further online educational experiences, nor does it attempt to measure or place value on aspects of performance. It does, however, attempt to create a dynamic, open frame for observing and discussing issues which describe the learning environment of one case study - the NDDL Law 12 course.

Development of Research Frame

The development of an open frame is based in the work of Goffman (1956, 1974) centering around question of what a researcher's understanding of observed reality is. He rephrases William James (1869) when he says, "The important thing about reality ... is our sense of its realness in contrast to our feelings ... " (p. 2).

The very question of reality and perceived reality is essential to this research. Participants (learners, teachers, project team, etc.) wrestled with various realities, and it is essential to recognise that some individuals functioned solely in the virtual reality of telecommunications and data files while others maintained a traditional physical reality involving face-to-face communication and paper. How participants made sense of their individual realities, moved between them, and the affect they had on performance is discussed in Chapter Five. The work of Vygotsky (1981, 1986) and Turkle (1995) informs this area, probing the issue of individual consciousness and the impacts social constructs have on activity.

The impact the online environment (telecommunications - computer and audio conferencing) had on actual practice permeates this research and is so integrated into each code that it is easily forgotten as a factor in its own right. The virtual environment and computer conferencing in general is discussed in Chapters Two (Section C) and Five (Section D). They form complex artefacts which influence the tangible and intangible aspects of the socio-cultural environment in which the participants function.

Goffman states three factors affecting a researcher's view of reality:
1. the portion of time, place, and action chosen for observation;
2. the degree of involvement the researcher has in the observation; and
3. the degree to which the reality is in conflict or contradiction with generally held beliefs.

These three factors inform this research, and in response to Goffman's factors:
1. The research was conducted for the duration of the LAW 12 course (September 1995 - June 1996) and reviewed all the NDDL public documentation from 1993 - 1996.
2. The researcher was involved as both a participant in the NDDL program (facilitator and mentor - Chapter Four) and a participant observer in the research.
3. The researcher shared and still does share a belief in the practice that was studied.

Researcher involvement within the site being studied is well supported in the work of Vygotsky (1978) and others (Argyris, 1992; Lomax, 1989; Senge, 1990; Thompkins, 1993). Vygotsky (1978, p. 9) states that "... carrying on theoretical work in an applied context pose[s] no contradictions." He supports the notion that it is the analysis of process not product that is at the heart of research. This is grounded in his theory that higher mental functions begin as external social activities which should be observable in the early stages of research. Consequently, a research design could be structured to observe an individual's external activities and then be able to follow the personal transformation of the activities as they become internalised through knowledge, skills, and activities. Vygotsky (1978) also recognises the degree to which the social environment affects the learner's cognitive development. This view is consistent with the value this research places in social interaction, social development, and knowledge-building.

Goffman (1974, p. 7) suggests a research design consisting of a frame and codes. He describes a frame as the "... principle of organization which governs events." For example, frame is the method in which people go about doing a task or activity. He defines a code as "... a device which informs and patterns all events that fall within the boundaries of its application" (p. 7-8) or frame. In essence, code is a label or description for the events within the task or activity (frame). Frame analysis, the design for this research, is then the examination of the events that have been coded within a particular frame to determine the larger experience.

Initial frames and codes were drawn from previous research and review of literature; however, additional frames and codes were developed as the research progressed. These additional frames and codes were drawn from the actual practice within the case study which prompted a further review of the literature. All the following literature references are discussed in Chapter Two and offer frame analysis in the following categories:

- groups and intellectual teamwork (Galegher, Kraut, & Eigdo, 1990b; McClure, 1994)
• socially constructed cognition and student perceptions of the virtual environment (Hawkins; 1991)

• participant structures (Riel & Levin, 1990)

• knowledge-building communities, knowledge construction, and higher order thinking (Scardamalia and Bereiter, 1994)

• personal agency (Mink et al., 1993)

Work on action research (Argyris, 1992; Crawford, 1995b, Vygotsky, 1978) informs the analysis of organisational behaviour and learning. Argyris’ concepts of single-loop and double-loop learning are critical for the understanding of the structural process presented in Chapters Four and Five (Section A) and the design for this research approach. Work on learning organisations (Chawla, 1995; Kofman & Senge, 1993; Nonaka & Takeuchi, 1995; Senge, 1990) helps to conceptualise the frame connecting Argyris’ action theory with Scardamalia and Bereiter’s schools as knowledge-building organisations theory.

While their work is presented in Chapter Two and mentioned earlier in this chapter, it is important to restate that Argyris & Schon’s (1978) work on double loop learning and organisational learning is pivotal to understanding the approach taken by the researcher. It is this process that allowed for the review of the initial findings of the case study and the development of an inquiry which led to a rich analysis of the structural process and behavioural issues within the NDDL project.

Researcher’s Role

The researcher has been involved in the case study site since 1993 - its first year of operation. Because of this relationship, the researcher was both a participant observer and an active participant. Involvement of this type is supported in the literature of action research, validating “... the connections between experience, knowledge and activity” (Crawford, 1995b, p. 240).

Thompkins (1993, p. viii) notes that it is

... sometimes assumed in the social sciences that objectivity requires the exclusive use of the scientific personae; ie, the third person. I disagree, concurring with Henry David Thoreau that it is always the first person speaking - whether we acknowledge it or not.

This research acknowledges the importance of voice and will use third person for the reporting of the literature and research findings, reserving first person for reporting observations as a participant in the case study.

During the first year of the NDDL project (the case study), I was a site facilitator and had a number of learners enrolled in all four of the courses which were offered.
Since that first year, I have continued to have learners enrolled in NDDL courses. Because of that involvement, I was able to develop an espoused theory (Argyris, 1992) which informed the initial design for this research.

One month into conducting the research, I was invited to be a mentor for a Writing course in the NDDL program. This experience was helpful in understanding the structural process of the project, determining participant roles, and gaining an emic view of the research site. Participation of this type is well supported in the literature as it supports rich involvement, allowing the researcher to establish herself in the culture of the organisation.

Once the Law 12 course was finished for the year, I remained in contact with the mentor and project team. I also conducted face-to-face interviews with two of the most active learners in the course in July, well after the course had been completed. I returned to the NDDL online site during the following school year to ask additional questions and participate in the November 1997 mock trial activity which was held online.

Methods and Ethical Concerns

The methodology for this research followed the ethnographic-inductive design which was described earlier in this chapter. However, I had not only moved beyond the traditional theoretical research into the field, but into a virtual field - a field existing in cyberspace. This cyberfield allowed me to include participants from all over British Columbia; geography was not a factor in participant selection.

Conducting research of this type requires technical as well as research skills, causing me to constantly balance my presentation of self (Goffman, 1956) in a virtual environment with no physical clues to help with the collection of information. It must be noted here that unobtrusive research (Kellehear, 1993) conducted online raises an additional set of ethical questions. Questions such as a participant's awareness of the researcher's identity and role, the researcher's access to online messages, and the researcher's ability to "lurk" in an online conversation and not be noticed must be continually addressed during the data collection. Lurking is especially relevant as it refers to the actions of an individual online who only reads the textual interactions but does not contribute. Without doing an electronic search to determine who is online, lurkers can maintain a voyeuristic role and can watch the action undetected.

In this research, each time I asked questions or made comments online, I made certain that the participants were aware of whether I was speaking in my role of teacher/mentor, teacher/facilitator, or researcher. This is an important point as the computer environment has the potential to obscure one's identity, and mistakes are frequently made about individuals' roles (Chapter Five - Section B).
Permission was requested from the Open Learning Agency and the British Columbia Ministry of Education, Skills and Labour (organisations responsible for NDDL) to conduct research in this project. Permission was also requested from the mentor of the course and each of the learners and facilitators involved in Law 12. Law 12 was selected for this research for a variety of reasons. The first being that the instructor was one of the two original mentors in the NDDL project. A second reason was her course was quite popular, in terms of student enrolment figures, and it did not conclude with a MoEd government examination. This meant that there was greater potential for instructor modification of the curriculum as there was no standard provincial exam at the end of the course. Third, the mentor was recognised within the NDDL community, as well as provincially and nationally, as a Law specialist and an accomplished teacher in distance education. Information from a paper which she presented at an international distance education conference is included in this research. A final reason was her willingness to be involved in the research and her openness about hoping that this research would improve not only her practice but the practice of the NDDL project and distance education (Mentor 5, Personal Interview Notes - Summer Symposium, 1995).

All those involved in the site were aware that research was being conducted and were aware that I would be a regular member of the online conferences and audio conferences. The participants and the program project team agreed to participate in the research, and all participants and project team members were able to communicate with me either online, in person at the summer symposiums, or via audio and audio/graphic conferences.

I was introduced online to the Law 12 course participants by the course mentor. She explained to the participants that I was both a mentor of one of the courses and a researcher. She also explained the purpose of the research, that it had been given permission by the project team, and that she supported the research in the hopes that it would inform the practice of teaching online and suggest areas for improvement.

A conference area, Law 12 Research, was created within the main course conference for issues related to the research. It was hoped that this site would encourage participants to share experiences and strategies. It was also intended that this conference would provide an opportunity for informal chat among members, reflecting Rheingold’s notion (1994) that “idle chat” often sets the context for communities whether virtual or not. Because the level of online participation in the Law 12 conference was very low and almost no interactive dialogue was generated, the Law 12 Research conference was closed. It was felt that any additional distractions from the main Law 12 conference might affect learner performance.

A list of research participants was determined from their online participation. I had access to all the public conference notes, and the First Class Conference Software
generated an index to all those notes, including topic heading, user name, date, and time. Based on that index, I was able to determine the names of all learners who were actively participating in the course. Questions were sent to those individuals. Questions were also sent to the facilitators of those learners, to the course mentor, and the project team. Face-to-face interviews were conducted with seven participants (two learners, three facilitators, and two project team members). These individuals were selected from the online interview responses. The learners were selected for their variety in terms of the five assumptions (Figure 13). The facilitators were selected because of their connection with the learners who were interviewed. The project team was selected because they had a major impact on the project design.

Notes from those interviews and the online conferences are included in the case study presented in Chapter Five, but the individuals’ names have been removed, referring to them instead by title and a number (e.g. Mentor 5 or Student 3). I maintained a journal throughout the course of the research and was a presence in various activities (audio conferences, conference discussions, e-mail exchanges, etc.).

As stated earlier, this research commenced with an espoused theory which suggested that a community of learners would be established within the NDDL online environment and that this community would negotiate learning opportunities that would encourage knowledge-building. Initially, the written documentation of the NDDL program was analysed which determined the stated intentions of the program - its espoused theories. This analysis confirmed that the espoused theory of the research was consistent with the project’s stated intentions. The initial research frame was used to analyse the NDDL materials.

Online conference data was downloaded from the main server into text files. This was a labour intensive process as the conference software did not allow for a generic capture of all notes. Each note had to be copied and pasted into a text file and then arranged in chronological order. Many times during the data collection either the local connection or the connection to the main server was down so time allotted to this process was lost. It was a good reminder of the frustrations experienced when one works online and made me more sympathetic to the problems reported by the participants in Chapter Five (Section D).

As stated earlier, in time it became clear that the researcher’s espoused theory, and the espoused theory of the project, were not consistent with the actual practice. In order to understand the ambiguities and inconsistent relationships between the espoused theories and the theory-in-use (Argyris & Schon, 1978), the research design was modified to reflect the frames and codes of learning organisations (Chawla, S. & Renesch, 1995; Scardamalia & Bereiter, 1994; Senge, 1990) and action research (Argyris, 1992; Crawford, 1995b; Nonaka & Takeuchi, 1995) to develop a theoretical base.
These frames form the basis for Chapter Five and allow for the presentation of the results in terms of Stated Intentions (espoused theories), Actions (theory-in-use), and Key Conclusions (links between the actual practice and the literature). Codes within each of the sections are determined from either the organisational artefacts (handbooks, resource guides, memos, etc.) or the original research design. The participant groups remained the same, but members from the organisational structure (the project team, DES, and MoEd) were included. These modifications allowed for the determination of a descriptive and normative view of the actual practice of case study.

After modification of the research design, using an action research approach, the espoused theory which guides this research states schools must become organisations for learning capable of creating environments promoting innovative practice and knowledge-building for all learners (educators and students).

Summary

This research design is based on Goffman’s (1974) theory of frame and code analysis and situated in action research (Argyris, 1990; Crawford, 1995b). It is an ethnographic-inductive design (Kellehear, 1993), allowing the researcher to engage in systems thinking (Chawla, 1995; Kofman & Senge, 1995; Senge, 1990) to construct social theory. Because the researcher was also a participant in the case study, the first person voice is used to reflect her participation (Thompkins, 1993) and distinguish it from the third person voice used for reporting the literature view and research findings.

Research Questions

5.1 Was a community of learning formed in the NDDL Law 12?
5.2 Did the community of learning negotiate opportunities to encourage cognitive development?
5.3 Can schools become knowledge-building communities, sustaining and encouraging innovative practice and knowledge-building.
5.4 Are NDDL espoused theories (vision and goal statements) consistent with actual practice (theories-in-use)?
CHAPTER FOUR  
THE NDDL CONTEXT
AN EXPLORATION OF ACTUAL PRACTICE

For every activity there is a certain appropriate scale, and the more active and intimate the activity, the smaller the number of people that need to take part. The appropriateness of the scale is determined by the task.

Schumacher - Small is Beautiful - 1973

Introduction

The New Directions in Distance Learning (NDDL) project was selected as the site for this research for a variety of reasons. One of the most compelling was that its conceptual design had been developed from both the theoretical research found in the literature and actual practice in a telecommunications project conducted in the interior of British Columbia, Canada. The program offers a model for actual practice which allows individuals to participate in an innovative, online learning environment. It was believed that this program had developed a learning environment which promoted innovative practice and cognitive development among a community of learners. I developed this initial theory based on my previous experience as a researcher for a telecommunications project, SITP described below, and my continuous participation in NDDL from 1993 until 1996, both as a facilitator and a mentor.

Origins of the NDDL

Research informed the planning for the NDDL project (Project Team 3, Personal communications, August 16, 1993). SITP had used telecommunications technology to connect schools within the Okanagan Valley of British Columbia with other teachers and learners, subject experts, and Simon Fraser University (located near Vancouver, BC). The SITP research discovered that while some portions of the program had been successful (e.g. Salmonoids Online had active participation and supportive feedback) others had been unused or a source of frustration for teachers and learners (e.g. the writing groups were inactive and received negative feedback from participants). The

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1 Other reasons: (1) initial project team is respected as innovators in education; (2) project team was highly regarded in Canada as knowledgeable in computer supported education field; (3) project was approved and funded by the provincial Ministry of Education; (4) NDDL was starting fourth year of operations when the research began; (5) NDDL project was recognised nationally and internationally for its innovative uses of information technology.

2 Information on the SITP research is based on my observations as I had been a principal researcher for the SITP project (1991 - 1992).
research suggests that participants in telecommunications must see online projects as more than just additional, alternative activities in the already crowded educational curriculum; participants must be able to develop authentic tasks and sustainable reasons for communications in order to maintain interest and find relevant uses for the telecommunications links (Research Notes - Spring 1992).

From the SITP research, and the actual experiences of the SITP project team, the vision for the NDDL project was created\(^3\). An NDDL project team was formed (key people from SITP and experienced educators from distance education schools). They began to explore how telecommunications could be integrated into the existing curriculum and incorporated into an instructional design so as to be used effectively and become part of an ongoing educational environment.

An area thought to be able to support the integration of telecommunications was distance education. At that time, correspondence education was delivered primarily by regional distance education schools (DES). Each DES had a principal and a staff of markers, teachers, and office personnel. These regional centers were part of the Ministry of Education (MoEd) and had the expressed mandate of supporting correspondence students whether they be in traditional schools, at home, in hospital, or enrolled in alternative education sites. When the NDDL project started, DES had a reported course completion rate of approximately 11 - 18\% (Porter, 1993), meaning that of the students enrolled in various courses, only 11 - 18\% of those courses were completed with passing grades. The variance in percentage was attributed to whether sites included elementary students in their figures. Traditionally, elementary students complete their work in higher numbers, and DES sites varied as to whether they reported elementary and secondary completion rates combined or separately.

With the objective of improving distance education success rates and increasing the variety of course offerings for small, rural high schools in British Columbia, NDDL was born. It had the potential to become an organisation for learning as the project team was allowed to develop a separate organisational structure outside the strict confines of the Ministry of Education (Project Team 3, E-mail Communications, Spring 1996). This was possible as it was a pilot project with its own budget and a mandate to explore online distance education options.

The First Year (1993 - 1994) Step One\(^4\)

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\(^3\) Summary statements such as these are formed from my participation in the NDDL project, attendances at summer symposium, and reading NDDL correspondence and documentation.

\(^4\) As the research began for this chapter, it became apparent that the history of this the NDDL project had not been officially recorded into the organisation's memory (Argyris & Schon, 1978). In terms of this research, the lack of an organisational memory required me to review all the project's
Participation in the initial pilot year of the NDDL project was by invitation from the project team (former SITP members, an experienced distance education administrator, computer hardware and software specialists, and Open Learning Agency staff). The project coordinator (D. Porter, Personal e-mail communication, October 11, 1996) explains "The first sites were selected on 'aptitude.' [We] ... looked at critical success factors such as ability to take a risk, a flexible timetable, a known track record with technology projects, and need."

Each site was provided the necessary hardware and technical support to sustain the project, and schools were required to supply a site based facilitator; a room with a phone line; access to the Knowledge Network block television feeds; and equipment such as a television, VCR, and FAX machine. Eight sites joined the project, and seven actually enrolled learners in some or all of the four courses offered (Ministry of Education & Open Learning Agency, 1994a).

Figure 14 is an organisational model, based on my personal observations and NDDL artefacts, illustrating the developmental steps in the four years of NDDL included in this research. The initial year is shown as Step One.

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<th>STEP ONE</th>
<th>STEP TWO</th>
<th>STEP THREE</th>
<th>STEP FOUR</th>
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<th>STEP FOUR (Negative exp.)</th>
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<td>STEP FIVE (Sept. 1995)</td>
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<tr>
<td>POTENTIAL FOR REFORMED PRACTICE</td>
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<td>STEPS SIX (June 1996)</td>
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<td>TRADITIONAL PRACTICE (TP)</td>
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INNOVATIVE PRACTICE (IP)
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Figure 14. Chronology of the NDDL project

Sites were told that NDDL was "... designed to provide support for students enrolled in senior secondary courses through the use of communication technology and enhanced contact with course tutors or mentors" (Open Learning Agency, Ministry of Education, & Ministry Responsible for Multiculturalism and Human Rights, 1993b, p. 64)

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organisational artefacts (FAX correspondence, promotional materials, handbooks, etc.), collect correspondence from early participants, and piece together events from participants' memories and stories about developments.
3). Site facilitators and project mentors (course instructors) were invited to attend a two day symposium held at the Open Learning Agency in Burnaby which “... provided technical training, as well as an opportunity for all those involved to meet and plan for course delivery ‘events.’”

From a participant’s point of view, the early stages of the NDDL project were very much trial and error. Frequent faxes went out to project participants updating course offerings, student enrolment, and procedural operations. Regular audioconferences were held for all those involved in the project (except the learners), and the project team openly discussed problems and successes. Sites were visited by the project team. At this stage of the project’s development, strategies such as organisational dialectic and inquiry (Argyris & Schon, 1978, p. 3) were a regular feature. NDDL appeared to be using principles of double-loop learning as the project team detected errors in the organisation model and corrected them in “... ways that involved ... modification of [the] ... organization’s underlying norms, policies, and objectives.”

Participants in the project were encouraged to make continual assessment of hardware and software. Regular communication concerning hardware, software, and gaps in support for specific applications was provided through the monthly audio conferences, but private e-mail or phone calls to the project team were encouraged. The NDDL project team made adjustments as the technology developed, causing change to be a regular and exciting feature of the program.

Based on interviews with the project team and my observations of their actual practice, it appears the NDDL instructional design and organisational structure reflect a progressive adaptation of what the project team had learned from traditional educational practice and research into online educational experiences. They also reflect the constraints imposed by the Ministry of Education which affect the project’s design (curriculum and hiring of mentors and facilitators). In the NDDL project, learners (mentors, facilitators, and students) participate in the instructional design to address their specific needs (eg. increased course offerings and alternative delivery of instruction). Each was expected to engage in progressive problem solving activities, leading to the accomplishment of their specific goals. Activity theory (Figure 5) would suggest that each participant could reflect on activities, and depending on their personal agency and understanding of the program structure, assess whether they had been positive or negative experiences (Steps Two and Four, Figure 14). Theoretically, this reflection would affect their future needs and activities.

Connecting the entire NDDL instructional design is a conferencing network. It was assumed that all participants would interact via electronic conferencing, using the First Class software provided by the project. From a communication perspective, members of the project were expected to participate in organisational dialectic with other
members. Figure 15 illustrates the network structure, assuming that facilitators might have an average of four students enrolled in three of the four courses offered.

Rogers (1983, p. 28) identifies this as a communication network which "...consists of interconnected individuals who are linked by patterned flows of information," suggesting individuals within the network learn the patterns by participating with opinion leaders who model activity. This concept of opinion leaders is consistent with the notion of expert practice (Brown, 1994; Scardamalia & Bereiter, 1994) presented in Chapter Two (Section A). Gradually more people become opinion leaders after gaining technical skills, social acceptance within the organisation, and an understanding of the evolving norms of the group. Rogers (1983) suggests opinion leaders become the change agents within the system. In actual practice, I observed that some participants from the first two years in the NDDL project became change agents, encouraging other schools in their districts to join the program or assuming additional roles and responsibilities within the project team (eg. running audio conferences) or leadership roles at summer symposiums (eg. presenting sessions).

The ability to participate in the communication network was essential in the NDDL instructional design and organisational structure. Because there was relatively little face-to-face conversation. primarily due to geographic distance, a virtual communication network (telephone, e-mail, computer conferencing) was critical for organisational dialectic. All participants in NDDL used the same network tools and had to develop effective communication strategies.

The Schools Program Pilot Project courses will be mediated by a variety of technologies and communication tools designed to enhance student involvement, interest, and participation. These technologies include audio conferencing, video, block feeds and television broadcasts, audiographic tutorial sessions, electronic mail, computer conferencing, and access to electronic databases of information. Students will be able to speak with tutors and mentors on a regular basis, as well as communicate with other students through electronic mail and computer conferencing services. Using these technologies, students will not only increase their access to information, but will develop a sense of 'community' with the other students, as well as the course tutors and mentors.

Figure 16 illustrates the technology and its application, ranking each as to its ease of use. Based on this research, it appears all participants could use the first level of technology while the more advanced levels were used with varying degrees of success. Technology use is discussed in Chapter Five (Section D).

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<tr>
<th>TECHNOLOGY</th>
<th>APPLICATION</th>
<th>EASE OF USE</th>
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<tbody>
<tr>
<td>Audio conferencing</td>
<td>• Student connections</td>
<td>Easy</td>
</tr>
<tr>
<td>Television / Video</td>
<td>• Course enhancement</td>
<td></td>
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<td></td>
<td>• Increased interest</td>
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<td></td>
<td>• Timeliness</td>
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<td></td>
<td>• Updates</td>
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<tr>
<td>Electronic mail</td>
<td>• Increase communication (personal, group, lists)</td>
<td>Training Required</td>
</tr>
<tr>
<td>Data bases</td>
<td>• Access &amp; transfer of information</td>
<td></td>
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<td></td>
<td>• Access to resources</td>
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<tr>
<td>Audiographies</td>
<td>• Teaching</td>
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<td>Computer conferencing</td>
<td>• Tutoring</td>
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<tr>
<td>Video conferencing</td>
<td>• Small group</td>
<td></td>
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<tr>
<td></td>
<td>• Technical information</td>
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Figure 16. Ranking, by ease of use, of technology and applications used in NDDDL.

The Project Handbook was one of the first formal organisational artefacts produced by NDDL. Prior to it, organisational procedures were presented via letter, FAX, and/or telephone.

The instructional design for NDDL was based on a triad: the learner, mentor, and site facilitator. In all cases, site facilitators were teachers in provincially-funded locations, and the learners came to the sites for some portion of their instruction.
Mentors were hired either by the Regional Correspondence Branch, a department within the Ministry of Education, or seconded by the NDDL project from school districts.

In actual practice the triad model is not an accurate depiction of the instructional design. Learners did not have an interactive role. They were encouraged to communicate with their peers and mentors, but they had no direct contact with the project team. The project team, who had created the design, is not shown in the learning triad, yet it has the most influence on its form. However, both the facilitators and the mentors were consulted regularly (e-mail, FAX, audio conferences) as to the effectiveness of the design, and it is assumed they were expected to be the spokespersons for their learners’ concerns (OLA Staff 1, Personal communications, October 12, 1995).

While the project team did create an innovative instructional design, due to cost and time, they were not able to create new curriculum or assessment strategies for the online environment (Project Team One, Interview, August 1995). As Brown (1994) states, these are at the heart of an intentional learning environment; an environment it appears the NDDL team were attempting to develop. The curriculum, in most cases, was traditional DES course material, and to varying degrees, individual mentors modified it. However, it must be noted that as this was a pilot project; none of the mentors had taught online before using the technology (Figure 16), so an understanding of how to make modifications was part of the program’s intended outcomes (Open Learning Agency, Ministry of Education, & Ministry Responsible for Multiculturalism & Human Rights, 1993b).

The facilitators were given a seven page description of their role in the project (Open Learning Agency et al., 1993b, p. 1). This description was elaborated on during the Summer Symposium at a facilitators’ session. The facilitators’ role was to

- Provide a physical setting that creates an effective learning atmosphere;
- Ensure that the technology is in place and working properly;
- Ensure that all participants are trained to use the various pieces of software and hardware involved in the project;
- Evaluate student progress and the learning situation

The ability of facilitators to accomplish these tasks is discussed in Chapter Five (Sections A & B).

Descriptions of each of the above points were given in the guide, focusing on technology and learner motivation. Course descriptions were included in the handbook, as well as guides for the installation of hardware and software required to support the project. Each site was loaned a computer pre-configured with computer conferencing software and curriculum support materials (e.g. Biology 11 data files for the audiographics conferences).
The New Directions in Distance Learning - 1994 Interim Report was the first published evaluation of the NDDL project. It was written by the project team after its tour of the sites and analysis of conference data (audio conferences, mail, etc.). The report offered a view of how the project was being implemented across the province. It also reported participant concerns with the instructional design. This document is discussed in detail in Chapter Five (Section A).

At the end of the first year, evaluation forms were circulated to all project participants (mentors, facilitators, and students). Based on these forms and other feedback from participants, modifications were made to the NDDL project, and the program prepared to begin its second year as a pilot. The project team determined that additional sites would be added for the 1994-1995 school year, and fees would be charged for courses. During the first pilot year, there had been no course fees. Fees were set at the regular DES rate ($250) plus $125 for NDDL mediation. Further details concerning NDDL procedures are discussed in Chapter Five (Section A).

The Second Year (1994 - 1995) Step Three

The 1994 - 1995 school year started with a summer symposium similar to the first. Twelve sites were involved, and the course offerings increased from the original four to ten. NDDL promotional material went out to all districts, and the project team visited the original pilot sites to encourage their continued participation.

Feedback from the evaluation forms of the previous year had been considered, and the NDDL 1994 - 1995 Project Handbook formally presented a Conceptual Framework and Instruction Model to reflect participants' concerns about program organisation. It was this model that further defined the triad relationship between the learner, the teacher-mentor, and the teacher-facilitator.

The 1994 - 1995 Project Handbook (Ministry of Education & Open Learning Agency, 1994, p. 2) did not completely address the issues raised in the Interim Report - 1994. However, the conceptual framework did state

In addition to providing more efficient distribution of course components, the newer technologies [used for mediation] are enhancing the quality and quantity of interactivity available to distance students - through audio, audiographic, video, and computer conferencing. The incorporation of these new technologies should result in increased success rates for distance education students in the senior secondary grades. Telecommunications technologies are also increasing the number of subjects and courses in which distance students can enrol.
Success rates for the entire NDDL project were not collected for this research. However, success rates for the 1995-1996 Law 12 course are discussed in Chapter Five (Section B).

The Instructional Model and program development were... based on the following concepts and values:

- A variety and mixture of media will be used to enhance learning. Choice of media will be based on subject matter, skills and processes being taught, and available delivery methods.
- Learning models and course components will provide flexibility in course design so that teaching and learning can be customised to meet the needs of students and teachers.
- All models and instructional settings will provide opportunities for interaction between teacher-mentors, students, and teacher-facilitators.
- The use of the community as an instructional resource will be promoted.
- Collaborative assignments and group will be encouraged.
- The integration of media will be stressed so that students not only read, hear, view, and write, but also gain experience in using higher order thinking and learning skills - moving from the acquisition of information towards evaluation, problem solving, application, and design.
- In an independent learning environment, the teacher-mentor, teacher-facilitator, and student will work in a collaborative triad relationship, each having clearly defined roles and responsibilities, which enhance student success.
- Telecommunications technology will be used to enhance independent study skills and to promote a sense of community among the students, who may be in different geographical locations.
- Frequent interaction between teacher-mentors and students will be encouraged through a variety of communication media.
- Learning groups may be set up to enable students to progress at different rates, while maintaining a core group of students to take advantage of scheduled tutorial sessions on specific topics, delivered through audio and audiographic technology.

The ability to integrate the concepts and values into actual practice is discussed in Chapter Five.
Guides for Teacher-Mentors and Teacher-Facilitators were included in the Project Handbook. The Teacher-Mentor Guide was 24 pages, focusing on the triad learning model, weekly procedures for contacting facilitators and students, moderating tips for conferencing, course and instructional design, and student learning guides. The Teacher-Facilitators’ Guide was 14 pages in length and presented the information from the previous year, a page describing how to get students started in an NDDL course, and 6 pages on equipment, physical layout of the room, and technical issues. A Student Learning Guide was added which covered the triad model and forms for tracking and recording progress.

The same organisational dialectic was expected in the second year, but the number of participants had increased dramatically (Figure 21). Figure 17 suggests that it would have been almost impossible for participants to sustain rich conversation with each other, and new participants faced an immense challenge attempting to communicate and learn the group’s history (Research Notes, Fall 1996).

PT = Project Team  M = Mentor  F = Facilitator  L = Learner

Figure 17. NDDL communication network (Step Three).
While the computer conference allowed individuals to asynchronously contribute messages and ask questions, there was no organisational vehicle to encourage lurkers (those who read messages but do not contribute) or reluctant members to contribute their ideas.

Viewed in activity theory (Figure 5), those participants whose needs were being met participated online, working within the constraints of the NDDL environment. Those whose needs were not met by the NDDL instructional design defaulted to traditional DES practice (Chapter Five - Section A & B).

Because of the limited interaction between year one and year two, the diffusion of the innovative practice learned during the first year of the pilot appears to have been restricted to those who directly experienced it (first year members). Rogers (1983, p. 6) identifies diffusion as a form of social change; a process "... by which alteration occurs in the structure and function of a social system." In NDDL, during the initial year, the promise of innovative practice created social change in the social. It appears that this occurred because all participants had committed to join the project (e.g. the project team) or had been invited to join based on common needs and/or skills (e.g. first year participants) However, when the social system expanded during the next two years, the majority of that social system consisted of new members who tended to default toward the traditional practice they knew best (Interview with Project Team 1 & 2; OLA Staff 1, July 1996).

Rogers suggests that individuals who hold a similar history tend to group together (homophily). This theory, coupled with activity theory and organisational learning (individuals whose needs are not met tend to default to perceived organisational constraints), helps to explain the shift from innovative practice to traditional practice (Figures 14 and 23, Step Four). Because participation in the second year of the project was open to any site in the province; individuals did not necessarily come to the project with the same critical success factors as those selected to participate in the first year. In the second year there appeared to be no obvious common thread connecting the new members with the original ones. They simply came from schools who responded to the NDDL promotional material and wanted to participate in the program. As there was no apparent common history to hold the expanded group together, theoretically, the lack of homophily and the impersonal size of the expanded virtual network may have prevented a critical mass of interaction to develop among participants. As a participant in the second year, I found that because so many of the names were new and the topics of conversation unrelated to my school experience, I rarely entered the Staff Room conference area. This was also true of the other facilitators from smaller sites interviewed for this research (Research Notes, Spring 1996).

The first group (year one participants) could be characterised as early adopters (Rogers, 1983) of the NDDL innovation and formed a homogeneous group of more
technically literate educators situated in small rural secondary schools. The second year included individuals with a more mainstream view of technology and the NDDL project who were situated in diverse sites. Some taught in adult learning centres while others were situated in larger urban centres. None had been specifically invited to join the project based on the previous critical success factors identified for year one participation; advertising about the program had replaced invitations to join. The social system appeared to have changed as there was no common group connecting the participants.

A fundamental principle of architecture sheds another light on the problem of the expanded network for year two. Alexander, Neis, Anninon, and King (1987) suggest the concept of “piecemeal growth.” This principle states

- no increment of growth can be too large
- each increment must add to the whole
- growth increments must not tree (hierarchy) from the center but form strong links to the center, supporting a sense of symmetry at the core.

In the case of the NDDL network in year two and beyond, it appears that the growth increment was too large, and the network was unable to maintain a balance between the growth and the central vision. The growth increments did appear to cause a hierarchy to be formed, encouraging the project team to direct information down to the participants instead of encouraging the more symmetrical relationship which had been formed in year one. Unfortunately, information was not collected from participants about the size of the network and its impact on their communications; the topic only emerged after analysis for the research data was completed and additional reading had taken place. However, it is an important area for future research.

The project team must have been aware of this problem as they suggested in the third Project Handbook (p. 1) that “The long term plan is to replicate the model locally or regionally, which would keep the scale manageable ....” Unfortunately, this did not happen as it appears that the concept of regionalism was tied to a much larger restructuring initiative in the Ministry of Education, Skills and Labour (E-mail Interviews, Spring, 1997). This initiative has only just been undertaken as this research is being written. The Open Schools Project (1997) will be responsible for NDDL and distance education in the province of British Columbia in the future, so issues of regionalisation and restructuring will be part of its mandate.

By midway in year two it was becoming obvious that teachers were joining the NDDL project to meet specific needs that their existing school programs could not offer (E-mail interviews (Facilitators 1-6, Spring 1996). Typically the teachers reported that the NDDL instructional design supplemented their on-site programs, and they viewed NDDL as an improvement on traditional correspondence. While participation required
teachers to learn to use the new technologies to support mediation strategies and to begin to rethink traditional teaching practices, none reported reluctance to learn and develop the necessary skills. What was reported was frustration with the actual hardware used and a need to clarify organisational issues which were presented in the New Directions in Distance Learning - 1994 Interim Report. These issues are elaborated on in detail in Chapter Five (Sections A & D). Participants were starting to detect a conflict between the organisation's theory-in-action and its actual practice.

Expressed in an activity model, teachers came to NDDL to meet the need of increasing course offerings at their sites (Research notes, 1995-1996). In the initial year of the pilot, all participants had previous experience with the DES instructional design (Figure 18).

![Figure 18. DES actual practice](image)

If a teacher determined that a learner's needs could be better addressed in the NDDL model, then Figure 19 reflects the activity.

![Figure 19. NDDL actual practice (Step One).](image)

If all went well during the NDDL course, activity became simplified (Figure 20). This is the model proposed by the project team and built on a learning triad. Figure 20
illustrates how free of administrative hoops and hurdles the triad model was. This factor becomes increasingly relevant as NDDL appears to be potentially threatening to the stakeholders in the traditional educational bureaucracy (DES staff and school based educators not involved in NDDL).

![Diagram](image-url)  
**Figure 20. NDDL learning triad(Step One)**

On the technical side, during year two each site was expected to maintain a server for computer conference connectivity (NDDL Communications, Spring 1995). This increased both the level of technical skill required for either a facilitator or a site based technical person and the amount of responsibility and time commitment to the program. The server also dramatically increased the price for participation in the project.

By the end of this second year, the gap between the stated instructional design and the actual practice had widened significantly (Research Notes, 1995). Because NDDL had not generated either the curriculum or the assessment criteria and because these were still not the responsibility of teaching staff (mentors or facilitators), the innovative practice proposed was not possible. The DES materials dictated the instructional design. One project team member noted that while the technology was permissive, the curriculum was too prescriptive (Interview, Project Team 3, August 1995). The need for revised curriculum to implement change is consistent with the literature presented in Chapter Two (Brown, 1994; Caladine, 1993; Weir, 1992).

Evaluation forms were sent out at the end of the year. All participants (learners included) were encouraged to complete the forms, and gifts (NDDL / Knowledge Network mouse pads) were offered as incentives.

**The Third Year (1995 - 1996) Step Five**
A central issue reflected on the evaluations was frustration with the site-based servers and the unreliability of the telecommunications links. In response, the project team restructured the server solution, and for the 1995 - 1996 year a host server was established at the Open Learning Agency. Sites were required to have a router connection to that main server, which again dramatically increased the cost to participate in the NDDL project. However, 34 sites joined the project, and the course offerings increased to 20. Therefore, the number of individuals potentially participating on the network increased. Figure 21 presents the number of people potentially interacting on the virtual network (OLA Staff 1, E-mail, May 1997). Referring back to Figure 17, imagine the network configuration with the 1995 numbers shown below replacing the 1994 numbers.

<table>
<thead>
<tr>
<th>Year</th>
<th>Project Team</th>
<th>Mentor</th>
<th>Facilitator</th>
<th>Sub Total</th>
<th>Learners</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>15</td>
<td>77</td>
<td>92</td>
</tr>
<tr>
<td>1994</td>
<td>5</td>
<td>10</td>
<td>12</td>
<td>27</td>
<td>100</td>
<td>127</td>
</tr>
<tr>
<td>1995</td>
<td>16</td>
<td>20</td>
<td>34</td>
<td>70</td>
<td>300</td>
<td>370</td>
</tr>
</tbody>
</table>

Figure 21. Number of participants in NDDL for the years incorporated in this research.

A summer symposium was held again to start the new year, and the NDDL 1995 - 1996 Project Handbook was circulated. Program overview information remained the same as previous years. The Teacher-Mentor's Guide was similar, but modified record keeping and assessment forms were added. The Teacher-Facilitator's Guide was reduced to six pages, and the Student Learning Guide remained much the same. The OLA server stabilised the connections, and fewer problems were reported.

However, it was during this year that the organisational hierarchy appeared to shift (Personal Observations). In the first year of operation, the project team was clearly directing the program. Strategies and organisational issues were presented to the participants and open for discussion and negotiation, but as the project scaled up, the opportunity for discussion and negotiation was reduced. Over the years of operation the project team increased from 4 members in 1993 to 16 in 1995. Operating procedures were stated in handbooks, and standardised forms appeared for communications. A question, therefore, arises. Did the scaling up of the organisation prevent it from engaging in double-loop learning or did the organisation, itself, become a limited learning organisation (Argyris, 1992)?

It is an observation of this research that because organisations (schools or programs like NDDL) are social innovations, over time they become diffused into the larger social system. They become artefacts (permanent institutions) that gradually
appear to affect the activities of the individuals who have created them as well as the activities of those associated with them. Rogers (1983) suggests that this gradual shift occurs as the innovation or artefact is adopted into actual practice, and he suggests this occurs when it is perceived to

- have a relative advantage to the users,
- be compatible with the existing norms and values of the social system,
- be user friendly (complexity does not overwhelm the user),
- be tried as a pilot project first before unilaterally adopted, and
- produce observable results that are beneficial.

It appears that once the artefact is entrenched in a specific social system, members who join later tend to assume the artefact is part of the system - a non-negotiable element of the status quo.

Seemingly, a second artefact develops, an intangible artefact which forms between people and their tangible artefacts and supports the development of unintended consequences (both positive and negative) which constrains the motives, activities and goals of individual actions. Activity theory (expressed in Figure 5) suggests the intangible artefacts in the work environment could influence the constraints under which individuals operate and therefore influence goals. When an individual’s goals are not met by the organisation, s/he tends to default to the goals of the organisation in which they are most comfortable (Argyris, 1993). In the case of NDDL, many participants defaulted to the traditional practice they had previously experienced with DES courses. However, some participants continued with the innovative practice as it did meet their specific needs. Intangible artefacts (organisational constraints) appear to exist in the background of organisations and while rarely spoken off or explained tend to add a layer of bureaucracy to an otherwise complex system (Personal observations, 1996 - 1997).

By the third year of the NDDL project, participants were assigning all sorts of blame and giving over large amounts of personal power to intangible artefacts. Statements like “They never call me to tell me of an audio conference,” or “They never explain how I’m supposed to do things” (Research Notes - E-mail communications and Interviews, Spring 1996 & Summer Symposium, 1996) suggest individuals were expecting someone or something to contact them. Rather than being pro-active themselves and directing specific concerns or questions to individuals, it appears that some participants became passive, assuming some one else would consult them or intuitively clarify their issues.

Sub-groups within the organisation, primarily formed of the year two and year three participants (Online conference messages, Spring 1996 and Interviews, Summer Symposium Research Notes, 1996) began to express their frustration with the
organisational structure, demanding clearer definitions of roles and responsibilities. As suggested before, these individuals functioned primarily in vertical networks (Rogers, 1983) which included layers of bureaucracy previously not given high levels of responsibility in the instructional design. Adding these levels placed additional steps of bureaucracy between a teacher's needs and goals, slowing down activities. This is reflected in Figure 22. Compared to Figure 18 (the traditional DES model), Step Five of NDDL had become increasingly complex. Therefore, it is not surprising that teachers began to default to traditional DES practices even though their learners were enrolled in NDDL courses. This default will be discussed further in Chapter Five (Section A).

Figure 22. NDDL actual practice (Step Five).

DES Administration appears twice on Figure 22 as some sites had to deal with DES both to enrol learners and then later to get grades and return curriculum materials.

The notion of an intangible artefact and its link to organisational bureaucracy is not a focus of this research; I became aware of it during the analysis of the data and suggest that further research into this topic appears to be warranted.

While the NDDL organisation continues, this research suggests that the innovative practices on which the program was based have been replaced by traditional DES practice. There is in little in the actual practice by Step Five (Figure 23) to distinguish it from the traditional DES model.

\[\text{and still continues. In 1996 it was reported 300 learners were enrolled in the program.}\]
Philosophy

The NDDL philosophy stems from the belief that students enrolled in distance education courses need to be supported in their learning. It focuses on the development of an instructional model which incorporates many of the capabilities of computer conferencing to mediate existing correspondence courses.

NDDL is partially a response to the 1991 Annual Report by the Ministry of Education, British Columbia, Canada. Porter, Fallick, and Dagert (1994, p. 1) state ... graduates surveyed from rural areas were less satisfied than urban graduates with the choice of courses offered by their schools and that they were less likely to meet the entrance requirements of BC post-secondary institutions. In addition, the report noted a 30% increase in correspondence school enrolments from the previous year depicting a trend whereby learners in remote areas are turning toward distance education, either partially or fully, to fulfill their educational requirements.

NDDL set out to address the equity of opportunity issue presented in that 1991 report. NDDL was "... designed to service remote schools which do not have access to the range of programs and resources available in large metropolitan school districts" (Open Learning Agency et al., 1993b, p. 4). The project was built on the research into traditional distance education which suggests learners "... need rapid feedback ... with respect to their progress ... abstract concepts illustrated and clarified ... [and] counselling support (a teacher 'in the loop') to tell them how they are doing and give them continuous feedback and encouragement."

Initially, the main objectives of the project were to improve the completion and success rates of the traditional correspondence courses and to build a model that would allow for the development and delivery of courses, using appropriate technology to assist learners receive materials and to support successful learning. The NDDL project states that its learning model

1. Promotes facilitative learning and provides fairly rapid feedback.
2. Enables learners to exercise freedom, choices, and responsibility.
3. Encourages learners to ask questions and share concerns with others.
4. Acknowledges that learners will not always be motivated self-learners.
5. Maintain[s] academic rigour in content and process (p. 8).

Based on participation in the project and research collected, it appears that items one and four are evident in actual practice. Items two and three were not evident as learners are not given a pro-active role in the learning model (Chapter Five, Section B) and only a limited community of learners formed. Item five is contentious as learners did complete
the assigned DES materials, but as suggested in Chapters Two and Five (Section A and B), these materials did not appear to encourage knowledge-building.

The NDDL project suggests that it will benefit learners as it
1. Provides access to a wider variety of courses - some of which are not available locally.
2. Provides students with a teacher who is specialized in the subject area.
3. Provides prompt feedback.
4. Provides an opportunity to prepare for independent work, such as that which is required for college and university.
5. Provides an opportunity to use leading edge technologies.
6. Provides opportunities to meet other students enrolled in the course from around the province.
7. Enables schools to extend their capability to a greater number of students.

Again, based on the research, it appears that all seven of the benefits were available to the participants. However, the degree to which they were realised varied based on the variables which are discussed in detail in Chapter Five.

Over the course of the three years of the NDDL project, which this research considers, the basic philosophy statement and goals have remained consistent. Additions have been made, such as an
- emphasis on self-paced, asynchronous learning;
- the desire to move away from print-based materials;
- the interest in developing more WEB based instructional support; and
- the need to attract a larger number of students from both urban and rural sites.

In his opening address to the 1996 Summer Symposium, David Porter, NDDL Project Coordinator, explains that the move away from print materials and the develop of WEB based support reflects the potential of the digital age and allows the project to print materials on demand and make timely revisions based on participant feedback or changes in curriculum. The need to attract additional students reflects the economic constraints of moving from a fully funded pilot project to a non-pilot program within the Ministry of Education (Research Notes, Summer 1996).

Analysis of NDDL Organisation Model

Guided by the research into organisational learning (Argyris, 1992; Argyris & Schon, 1978; Rogers, 1983; Senge, 1990), the following model is presented as an explanation of the NDDL organisational devolution of reformed educational practice. It
is based on my research notes, participation, interviews, and analysis of the NDDL documents.

Initial theory concerning the characteristics of learning environments was constructed in Chapter Two (Figure 9). Using those characteristics to represent broad concepts, the following model presents the actual practice of the NDDL experience and suggests that the NDDL organisation actually stopped being an organisation for learning by its third year (Figure 23, Step Five).

<table>
<thead>
<tr>
<th>STEP ONE</th>
<th>STEP TWO</th>
<th>STEP THREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory-of-action clear</td>
<td>Individuals work in organisation</td>
<td>Individuals with + experiences continue toward IP</td>
</tr>
<tr>
<td>Participants committed to project</td>
<td>Individuals reflect on practice</td>
<td>Individuals with - experiences stall movement toward IP</td>
</tr>
<tr>
<td>Organisation and participants work together</td>
<td>Learning shared w/organisation</td>
<td>Organisational artefacts appear inaccurate with actual practice</td>
</tr>
<tr>
<td>Development of artefacts</td>
<td>Individuals begin evaluation of practice (either + or - experiences)</td>
<td>1st awareness by participants that recommendations are not being acted on</td>
</tr>
</tbody>
</table>

**STEP FOUR - (Negative)**
- If critical mass of individual experiences negative, then continues toward TP
  - Organisation responds to negative criticism with single-loop actions
  - Organisation implements procedures to react to problems
  - Entrenches pyramid hierarchy

**STEP FOUR - (Positive)**
- If critical mass of individual experiences positive, then continue toward IP

**STEP FIVE**
- Project expands again
- Policy is stated rather than developed
- Increased participant demand for procedures / forms
  - Potential to restate vision and theory-in-action due to scaling up
  - Potential to allow expanded group to personally commit to project and review vision and theory-in-action

1996 Summer Symposium

**STEP SIX**
- Theory-in-use continues, more procedures / fixed roles
- Organisational artefacts continue to conflict with actual practice
- Individual / groups fight for power and embrace status quo for safety

TRADITIONAL PRACTICE (TP)  INNOVATIVE PRACTICE (IP)

**Figure 23. Summary of NDDL actual practice**

**Step One - Clearly Expressed Organisational Vision**
• Participants are invited to the project based on their own personal agency (selection based on critical success factors.) Participants are homogenous group as all are early adopters of technology and situated in small, rural secondary schools.

• Because participants have personal agency, organisation⁶ is capable of responding creatively to program constraints and challenges as they occur.

• Potential exists for double-loop learning as organisation is engaging in organisational dialectic and organisational inquiry - open system.

• Communication open and regular via FAX, phone, letter, and audio conferencing with all participants.

Step Two - Individual Action within Organisation

• Individuals openly express their commitment, not compliance, to the project teams’ vision and become members of the organisation. These individuals are early adopters; they tend to network with others in horizontal manner (Rogers, 1983). They have a history of self-sufficient behaviour and tend to be less reliant on traditional hierarchy for direction.

• Project team encourages trust to the long term vision of the project and develops quality circles of activity to promote individual participation in the project.

• Project members interact with one another based on their personal agency (needs, history, and sense of personal empowerment) and begin their own activities within the project.

• Participants begin reflection on their experiences and evaluate them in terms of positive or negative personal impact.

• If positive, individuals continue activity and participate positively within the organisation. Project team learns from them and is able to make corrections to organisational structure.

• If negative, individuals retreat from activity and potentially participate negatively within the organisation. Organisation cannot learn anything from the participants because their learning and activities are not shared with the group.

• Evaluation ongoing but formalised in Interim Report (March 1994) based on conversations, observations, online conference data, and written evaluations.

• Project team visits sites to determine needs and assess project success.

Step Three - Organisational Learning

—

⁶ Organisation - defined by Senge (1990) as being flexible, open to learning, capable of learning from individuals, and defined by its actions (cognitive artefacts). Concerned with vision, values, and shared mental models.
• Initial scale up of project. Increasing number of mainstream users of technology join. These individuals tend to be from larger, more urban sites. Group becomes less homogeneous. New participants appear to be looking for a clear hierarchy to direct actions as they are used to more vertical networks of communications (Rogers, 1983).

• Individual action and experience continues to contribute to organisation’s vision, but in a more limited manner. Quality circles form (groups formed for specific activities - mentors, facilitators, technicians, DES employees, etc.), but appear to not communicate with others in the larger group. Network center not capable of supporting increased numbers or encouraging inter-group communications; growth increment is too large, unbalancing the vision of collaborative group interaction.

• Project team appears less open to reflection, inquiry, and dialectic with participants.

• Original project vision less evident in actual practice.

• Project team states organisational vision which appears not open to modification by participants. Vision stalls and “can not come alive” (Senge, 1990). Organisation stops being an organisation for learning.

• **Negative** action from individuals (Step Three) causes organisation to
  • stall,
  • set entrenched procedures,
  • delegate activities and define rigid roles,
  • set boundaries between self and rest of organisation and outside world (Senge, 1990),
  • create cognitive and physical artefacts (procedures, rules, charts, manuals) that further conflict with actual practice.

• **Positive** action from individuals (Step Three) causes organisations to
  • learn,
  • develop sets of negotiation procedures ,
  • delegate activities based on individuals’ agency, allowing roles to be determined by the setting flexible boundaries between self and rest of organisation and outside world (Senge, 1990),
  • create cognitive and physical artefacts (activities and models) based on participants’ needs.

• Individuals who have positive experiences with program inform the project team, resulting in organisational learning.
• Individuals who have negative experiences with program strengthen vertical networks and seek to re-establish bureaucracy\textsuperscript{7} within the organisation.

• Issues arising from Interim Report are not addressed to the satisfaction of all members.

• Pyramid structure develops for hierarchy - limits method for organisation inquiry and dialectic - middle managers (change agents) in place for conferences which limits mechanism for error detection and correction. Good news travels up the organisational structure and bad news filters down (Thompkins, 1993).

• Formalised procedures for operations are developed.

• Phase 2 Review is published.

• Initial scale up of project begins.

• Learning Centres join schools as NDDL sites - participants increasingly different from first year participants. NOTE: Increasingly the majority of participants are becoming homogeneous again, but the group is different as it is now located in larger sites near or in urban centres.

• Project team visits sites to determine needs and assess project success.

• Project team (innovators) are perceived to be drifting to other projects (French program, Mexican project, etc.)

• Participants engage in decision processes (Rogers, 1983, p. 20) to further assess their experiences with the project. Newer members more susceptible to peer pressure which promotes a default to more traditional practice.

**Step Four - Individuals and Organisational Learning**

• Individuals feeling NDDL a positive experience continue to inform organisation. Organisation continues to learn, but in a more limited manner.

• Critical mass of individuals continue to experience negative action within organisation. They encourage the organisation to become a hierarchy, causing

1. individuals to protect themselves, placing the organisation second to themselves. Stakeholders (DES, MoEd, local sites) begin to assume territory originally belonging to organisation and begin to impose their structures on NDDL.

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\textsuperscript{7} Bureaucracy (hierarchy) - defined by Senge (1990) as being rigid, procedural, directing individuals rather than learning from them, and defined by physical artefacts (procedures, charts, manuals).

Concerned with management, organisation, and control.
2. lack of a commonly held vision or theory of actual practice for individuals (lack of organisational memory prevents members from collectively remembering origins of project)
3. individuals begin to lose power and flexibility as job descriptions further define bureaucratic roles that had previously been negotiated among participants
4. increased procedures, rigidly defining activities
5. quality groups become private work groups engaged in self protection
6. those with the highest agency, but typically further from the actual work, to set procedures

- Emphasis shifts from asynchronous timetable to site directed timetables as larger sites are less flexible in their scheduling.
- Restricted access to project team - middle managers employed. Communication only through virtual network tools (e-mail and computer conferencing).
- Sites with small bandwidth told NOT to participant in group audiographic conferences as it adversely affects other sites. These sites tend to be the small, rural sites for whom the project was initially designed.

Step Five - Scaling Up\(^8\)

- Increasing numbers of participants (mainstream) become involved in project; each with different needs from the organisation and different history with organisation (Figure 5).
- Some first year participants assume increased responsibility in project team (eg. one of the mentors is assigned the role of liaison between mentors and facilitators).
- New members unaware of organisational memory (history / context of vision). Questions asked by new members during audio conferences and summer symposiums reflect no awareness of NDDL philosophy or background.
- Organisational artefacts and maps are not accurate (theory in action and vision is not the same as the theory in actual use). For example, statements concerning the instructional model are not the same as the procedures used in actual practice as participants default to traditional DES practice instead of innovative NDDL practice.
- Pyramid structure for hierarchy - no method for quality organisational inquiry or dialectic - middle management reports on actual practice / no mechanism to detect errors and correct them (Chapter Five - Section A).
- System thinking is replaced by single-loop reactive responses to problems identified by others

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\(^8\) Scale up is described by Senge (1990) as the death of vision.
- Organisation defaults to traditional practices - resting on status quo as capacity for innovation declines.

A detailed analysis of the previous five steps, using examples of actual practice from the NDDL program, is given in Chapter Five (Section A).

Summary

The NDDL project began with a clearly expressed vision and goal statement which the program participants and project team modified and discussed during the first year of operation. This allowed the project team to improve the organisational design and encourage innovative practice (Figure 23, Steps One - Three).

By the third year, NDDL appears to have become a limited learning organisation. By the end of that school year, many individuals (typically the newer participants) were defaulting to traditional practice, and the organisational artefacts bore little resemblance to actual practice.

I believe that at Step Six, using the opportunity of a major scaling up of the organisation, the project team could have developed a revised vision statement and allowed the new members to renew their commitment to the program, returning the project to Step One. This would have required the implementation of regionalising the model (Project Handbook 1994 - 1995) and could have returned the project to innovative practice. This belief is based on continued conversations with the project team and an understanding of their commitment to innovative educational practice. It appears that the project team was unable to make this shift because of the Ministry of Education, Skills, and Labour's desire to revise the delivery of distance education through the development of the Open Schools Project.

Figure 24 uses three elements apparent in the NDDL structure to summarise the NDDL experience during the three years observed for this research. Noticeable is the shift from organisational learning in Steps One - Three to an entrenched organisational bureaucracy in Steps Three - Six. This shift corresponds with the loss of focus on knowledge-building presented in Chapter Five (Section B), supporting the argument that schools must become organisations for learning in order to promote innovative practice and support the building of personal knowledge.
<table>
<thead>
<tr>
<th>Step</th>
<th>People</th>
<th>Tangible Artefacts</th>
<th>Intangible Artefacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRE-STEP ONE</strong></td>
<td>- Project Team (Innovators)</td>
<td>- Theory-In-Use</td>
<td>- Spirit of INNOVATIVE PRACTICE (IP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Perceived need to improve success - distance education</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Project plan</td>
<td></td>
</tr>
<tr>
<td><strong>STEP ONE - TWO IP</strong></td>
<td>- Project Team (Innovators)</td>
<td>- Project plan</td>
<td>- Spirit of IP</td>
</tr>
<tr>
<td></td>
<td>- First facilitators and mentors (early adopters of technology / facilitators situated in small, rural schools)</td>
<td>- Theory-In-Use</td>
<td>- Organisational dialectic / inquiry (attitude of learning organisation)</td>
</tr>
<tr>
<td></td>
<td>- Homogeneous group</td>
<td>- NDDL Organisation</td>
<td>- Virtual community network (horizontal communication structure)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1st artefacts - correspondence with members</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Curriculum materials</td>
<td>- Sense of personal agency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Technology</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(hardware, software, user guides)</td>
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<tr>
<td></td>
<td></td>
<td>- Project handbook</td>
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<td>- Phase 2 Report</td>
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<td><strong>STEP THREE IP</strong></td>
<td>- Project Team (Innovators)</td>
<td>- Project plan</td>
<td>- Spirit of IP</td>
</tr>
<tr>
<td></td>
<td>- First facilitators and mentors (early adopters of technology / facilitators situated in small, rural schools)</td>
<td>- Theory-In-Use</td>
<td>- Limited organisational dialectic / inquiry</td>
</tr>
<tr>
<td></td>
<td>- Second year participants (mainstream tech users / facilitators from diverse sites)</td>
<td>- NDDL Organisation</td>
<td>- Potential for increased participation in virtual network</td>
</tr>
<tr>
<td></td>
<td>- Heterogeneous group</td>
<td>- 1st artefacts - binders, correspondence with members</td>
<td>- 2nd year participants seek vertical network</td>
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<td></td>
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<td>- Curriculum materials</td>
<td>- Decreased personal agency - 2nd yr. participants more reliant on authority for direction</td>
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<td>- Technology</td>
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<td>(hardware, software, user guides)</td>
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<td>- Project handbook</td>
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<td>- Phase 2 Report</td>
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<tr>
<td><strong>STEP FOUR IP / TP</strong></td>
<td>- Project Team (Innovators)</td>
<td>- Project plan</td>
<td>- Shift to organisation to solve problems rather than each other (return to hierarchy of traditional system)</td>
</tr>
<tr>
<td></td>
<td>- First facilitators and mentors (early adopters of technology / facilitators situated in small, rural schools)</td>
<td>- Theory-In-Use</td>
<td>- Movement toward TRADITIONAL PRACTICE (TP) for those with negative NDDL experiences</td>
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<td></td>
<td>- Second year participants (mainstream tech users / facilitators from diverse sites)</td>
<td>- NDDL Organisation</td>
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<td>- Heterogeneous group</td>
<td>- 1st artefacts - binders, correspondence with members</td>
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<td>- Curriculum materials</td>
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<td>- Technology</td>
<td>- Other reports</td>
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<td>(hardware, software, user guides)</td>
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<td>- Phase 2 Report</td>
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<td><strong>STEP FIVE TP</strong></td>
<td>- Project Team (Innovators)</td>
<td>- Project plan</td>
<td>- Organisation resuming TP</td>
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<td>- First facilitators and mentors (early adopters of</td>
<td>- Theory-In-Use</td>
<td>- Virtual network over expanded</td>
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<td>- Limited</td>
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<td>- NDDL Organisation</td>
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<td>- 1st artefacts - binders,</td>
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<td>Technology / facilitators situated in small, rural schools)</td>
<td>Correspondence with members</td>
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<td>• Second year participants (mainstream tech users / facilitators from diverse sites)</td>
<td>• Curriculum materials</td>
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<td>• Heterogeneous group</td>
<td>• Technology (hardware, software, user guides)</td>
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<tr>
<td>• Third year participants (mainstream)</td>
<td>• Project handbook</td>
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<td>• Phase 2 Report</td>
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<td>• Other reports</td>
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<td>• Increased number of procedures &amp; forms</td>
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<td>• No organisational memory chronicling events / modifications</td>
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<td>Organisational dialectic / inquiry</td>
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<td></td>
<td>Network tied closer to traditional hierarchy</td>
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<td>• Bureaucracy gradually returning</td>
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<td>• Innovators move to other projects</td>
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<td>• Some 1st yr participants gain increased responsibility in project team</td>
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<td>• Organisation seen as not handling problems effectively</td>
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<tr>
<th>Step Six</th>
<th>Project continues base on TP</th>
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<tr>
<td>• Project Team (Innovators)</td>
<td>• Project plan</td>
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<td>• First facilitators and mentors (early adopters of technology / facilitators situated in small, rural schools)</td>
<td>• Theory-In-Use</td>
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<tr>
<td>Second year participants (mainstream tech users / facilitators from diverse sites)</td>
<td>• NDDL Organisation</td>
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<tr>
<td>• Additional participants (mainstream)</td>
<td>• 1st artefacts - binders, correspondence with members</td>
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<td>• Group increasingly homogeneous but not with 1st yr participants</td>
<td>• Curriculum materials</td>
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<td>• Technology (hardware, software, user guides)</td>
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<td></td>
<td>• No organisational memory chronicling events / modifications</td>
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<td></td>
<td>Organisation functioning in TP</td>
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<td></td>
<td>Organisation becomes increasingly bureaucratic with various groups directing specific tasks (DES, MoEd, Project Team, Facilitators, Mentors, Learners)</td>
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<td></td>
<td>Organisation fragmented</td>
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<td></td>
<td>No spirit of IP</td>
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Figure 24. Summary of NDDL experience (people, tangible artefacts, and intangible artefacts)

Research Questions

4.1 Can an organisation scale up without resorting to pyramid hierarchies which prevent organisational learning?

4.2 Did scaling up limit the organisation’s ability to double-loop learn?
CHAPTER FIVE

RESULTS - ANALYSIS OF KEY ISSUES

With the modification of the initial espoused theory (Chapter Three), two main questions arose: (1) why a community of learners had not formed in the Law 12 course; and (2) why there was so little evidence of knowledge-building. In order to answer these questions, it appeared necessary to review the data through four main frames: (1) organisational structure affecting the learning environment; (2) attributes required for learning communities; (3) strategies to encourage interaction between members of learning communities; and (4) technical issues affecting online organisations for learning. Each of the four frames forms an individual section heading within this chapter and presents the findings from the research.

Section A - Organisational Structure Affecting the NDDL Learning Environment

Introduction

The New Directions in Distance Learning project must be viewed as an organisation (Argyris, 1992; Senge, 1990). It has theories of action "... which are maintained and transformed by individuals who occupy roles within the organisational structure and live in the behavioural worlds draped over those structures" (Argyris & Schon, 1978, p. iv). Therefore, analysing the NDDL organisational structure helps to determine the affect it had on the participants and project's stated intentions (theories of action).

Organisational structure refers to the actual distribution of resources (people, money, and equipment) and procedures for making decisions and carrying out operations. Inherent in the development of an organisational structure is the operational hierarchy which has created it.

Operational hierarchy is discussed in the literature (Argyris, 1992; Argyris & Schon, 1978; Senge, 1990; Thompkins, 1993) and is a major factor in the effectiveness of cooperative teams and the ability of organisations to learn. It affects communications among members as well as the development of individual agency in participants. Therefore, the manner in which NDDL developed its hierarchy and operating procedures has direct bearing on its ability to actualise its espoused theories of action.

It is a theory of this research that educational organisations such as NDDL must be organisations for learning if they want to promote innovative practice and encourage knowledge-building. As stated in previous chapters, the ability of an organisation to learn and develop is essential for its very survival; therefore, the organisation must create a learning environment for its members. One of the links between learning
organisations and knowledge-building communities is the ability of both to engage in organisational inquiry and dialogue (Argyris, 1993, 1992). Without this activity, the organisation has no mechanism to consult with its members and learn collectively from their experiences (Chapter Two - Section B).

Figures 15 and 17 illustrate how complex the communication network was for the NDDL participants. The number of people with whom interactions were expected was enormous. From the perspective of the pilot team, sustained interaction for organisational inquiry with all the participants (Figure 21) would have been impossible.

As NDDL moved into its second year of operation (Figure 23, Step Three), the ability for socially distributed cognition (Cicourel, 1990) was further limited. It appears that the NDDL project team assumed that dialogue among participants could be sustained even though a number of variables had appeared

- the project team stopped participating in audio conferences - middle managers ran them and reported back to the project team,
- the number of participants on the network had enlarged (Figures 15 & 17),
- the learning triad was less homogenous (Rogers, 1983) than in the first year (Research Notes, 1995 - 1996), and
- the project team was involved in other projects (Mentor 5, Interview, August 1995). These variables, plus the problems inherent in online communications (Walther & Burgoon, 1992), limited the interaction among NDDL participants.

A further issue affecting the NDDL organisation by Step Three (Figure 23) was its effectiveness to learn from its members. I could find no evidence that the NDDL organisation engaged in double-loop learning to respond to problems1. The innovative practice NDDL had started could not be maintained. Argyris (1993, p. 1) states “Any change that does not first change the meaning of effective action cannot persist” (p. 1). If a group sets out toward innovation, and that innovation does not affect the manner in which the participants act, the innovation cannot be maintained. This helps to explain what happened by the third year of the program. As participants began to evaluate their NDDL experiences, they began to make qualitative assessment of what had worked for them and what appeared to be unsuccessful. Because teachers are busy professionals with numerous of responsibilities and because many of those professionals in the NDDL project had limited amounts of time allocated for their NDDL duties, they had a tendency to discard any operational changes which did not show immediate benefit (Facilitator 2 Interview, July 1996). Examples of this are facilitators faxing assignments rather than using the electronic means or mentors not crediting online

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1 Summary conclusion such as this are based on my observations, research notes, online conference messages, and interviews.
participation as they might value classroom participation (Mentor 5, E-mail communications, June 11, 1996).

Argyris’ (1993, p. 29) research into educational practices, notes ... teachers’ view of teaching becomes one in which they shun elaborate ideas for dealing with complicated situations. They hold an uncomplicated view of causality, as if there were a one-to-one correspondence between cause and effect. They use intuition rather than a rational approach to explain classroom events. This reliance on intuition reinforces their simplified view of reality and makes them less open-minded when confronted with alternative teaching practices.

This view often results in the development of routines which produce immediate results but often prevents innovation and forces educational change back into the entrenched traditional method of operation. This is relevant in the NDDL project as a return to the status quo was particularly evident by Step Four of the NDDL program (Figure 23).

A question which arises from this research, especially after reviewing the organisational model, is how an organisation prevents entrenchment in hierarchy as it scales up operations. In other words, at Step Three (Figure 23), could the organisation and its participants have maintained a critical mass of positive experiences with the project, encouraging a continual progressional toward innovative practice while scaling up the size of the organisation? It is the assumption of the research that maintaining organisation inquiry and dialectic are at the heart of the answer as detecting and correcting errors tends to support positive experiences, regardless of the size of the operation.

Stated Intentions

The stated intentions of the NDDL project are presented in a variety of promotional materials (WEB sites, videos, brochures), but the official operational information is presented to the participants in the form of project handbooks which are revised each year. The handbooks are three ring binders which present the information in specific sections and have dramatically increased in size each year of the project.

The stated intentions, during the first year, were that NDDL participants would work together to increase the course offerings at small, rural secondary schools; enhance mediation of correspondence courses via innovative communications technologies; and explore the use of these new technologies. The NDDL project was designed to “...support ... students enrolled in senior secondary courses through the use of communications technology and enhanced contact with course mentors” (Open Learning Agency et al., 1993b, p. 1).
The instructional design assumed that both facilitators and mentors could operate the software appropriately and modify their teaching strategies to the technology being implemented. It was also assumed that each member of the team would contact the appropriate member for support and information. The responsibility for learner success was given to the facilitator, and that responsibility was stated in the handbook. To varying degrees the stated intentions were accomplished during the first year. This conclusion is based on participant feedback (New Direction in Distance Learning - 1994 Interim Report) and reported student success rates.

The 1994 - 1995 New Directions in Distance Learning Project Handbook, much larger than the 1993 -1994 version, reflects the first change in the operational hierarchy. The Open Learning Agency had been the first author in the original version, but in the second year, the Ministry of Education (MoEd) was. The binder included the same project overview as before, but a conceptual framework and an instructional model were added. These two additions moved the project beyond the notion that courses would be mediated to enhance student learning, and stated that the goal of the project was to "... increase and improve the curricula available for mediated instruction" (p. 1).

After a year of operation, the MoEd felt

... the newer technologies are enhancing the quality and quantity of interactivity available to distance students ... [and that the] ... incorporation of these new technologies should result in increased success rates for distance education students in the senior secondary grades (p. 2).

The instructional model introduced the idea of flexible course design; the community as a resource; collaborative assignments; strategies to stimulate different learning modalities; the triad learning model, supporting an individual learner and his/her facilitator and mentor; community of virtual learners; and self-paced, asynchronous learning opportunities. This second handbook included guides for mentors, facilitators, and learners. Success with this model is discussed later in this section.

The third project book, the 1995 - 1996 Project Handbook, includes guides and support materials developed for the 1994 - 1995 handbook, as well as new material:

- Get Connected with NDDL - The NDDL Communications Guide which consists of 114 pages explaining conferencing and e-mail software and Internet tools such as Gopher, Fetch, Mosaic, and others;

- Get Connected with TV Broadcasts which outlines block feed schedules and offers an overview of the programs;

- Learning Guides for Teacher-Mentors (26 pages), Teacher-Facilitators (12 pages), and Students (13 pages); and
• **Communications Guide**, which outlines the three tools used to connect NDDL participants - e-mail and conferencing, audio conferencing and audiographic conferencing, and Internet tools.

**Actions**

The 1993 - 1994 **Project Handbook** presents one objective - the mediation of four courses: Law 12, Introductory Math 11, Data Processing 11, and Biology 11. Mediating strategies are broken into three sections, categorised by ease of use and application (Figure 16). While limited training was offered to the facilitators in the use of each of these strategies (approximately a 1 - 2 hour workshop during the summer symposium), a collaborative environment was not established for the facilitators and mentors to learn to work with the new technology, develop their personal interpretation of the new roles presented in the conceptual framework, and function in the innovative instructional design. The educators needed the opportunity and encouragement to become learners if the NDDL program was to develop into a community of learners.

This experience supports Ancona and Caldwell's (1990) notion that participants in collaborative teams must turn to one other for support and expertise. However, frustration concerning roles and confusion over procedures were reported, and the Project Team responded as problems arose, offering software solutions or mediating conflicts (**New Directions in Distance Learning** Interim Report 1994). While facilitators reported a decline in enrolment in some courses, generally the NDDL model was deemed a success by the participants despite frustration with some of the technology and a few of the courses (Research notes 1996; Summer Symposium comments, 1995).

The Project Team requested facilitators to send in a progress report, and the compiled information from those reports and other data appeared March 8, 1994 in **New Directions in Distance Learning - 1994 Interim Report**. This interim report presents positive comments about the project and includes five main issues affecting the delivery of the program. These five are fundamentally organisational problems, focusing on

1) the nature of the project - the conceptual framework;
2) the relationship between NDDL participants;
3) the definition of academic year - self-paced learning or prescriptive timetable;
4) project scheduling - site specific or NDDL dictated; and
5) process for problem / dispute resolution.

These five problems are central to the NDDL organisation structure and appear to have affected the organisation’s ability to learn and the participants’ ability to engage
in knowledge-building. At the July 1996 NDDL Summer Symposium, I observed that all five of these issues were still being raised. Members of the hierarchy (MoEd, OLA, and DES principals) openly fought for control in an attempt to solve these problems. By the end of the symposium, it appeared that the conceptual framework would remained the domain of the NDDL project team while DES and individual schools attempted to dictate issues two, three, and four. A process for problem / dispute resolution was not publicly addressed at the symposium, so it will probably continue to be an area of concern.

The NDDL project continues for the 1996 - 1997 school year and is gearing up for increased numbers in 1997 -1998. This research uses the July 1996 Summer Symposium as closure for formal data collection. However, interviews and e-mail inquiries were continued through November 1996. The five issues raised in the Interim Report are used as frames for analysing the organisational structure of NDDL.

Conceptual Framework

In questioning the conceptual framework, NDDL participants were actually engaging in organisation inquiry about the project's design. The facilitators and mentors questioned whether NDDL was "... solely an extension and enhancement of the correspondence model... [or] ... a substitute for a direct teaching situation" (p. 15).

This question reflected the political and logistical implications affecting the project. Some members of the teachers' union, who worked in pilot NDDL sites, had begun to feel threatened by the prospect of virtual colleagues challenging their sole delivery of specific curriculum content and taking their students. They viewed NDDL as having the potential to reduce their class enrolment figures and therefore, reduce the number of blocks they might teach certain subjects (Discussion at Summer Symposium 1995 & 1996).

The question also reflects concern from the facilitators as to how much direct instruction and mediation time they could expect from mentors for their students. The NDDL project had been vague about the difference in roles and responsibilities between the facilitators and the mentors. There was nothing formally stated indicating how mentors should interact with the correspondence materials or how learners should function with mentors.

Teacher-facilitators recommended that computer-mediated communications be incorporated into the instructional strategies for the course. Teacher-mentors, on the other hand, express the view that the use of online systems takes significant time beyond what a traditional marker in a correspondence course would require (Porter, Fallick, & Dagert., 1994, p. 19).
This potential conflict clearly demonstrated that roles for the facilitators and mentors were blurred. Students found it confusing and frustrating to use e-mail and wait for a response when a teacher was sitting right in the room with them. “Every time I needed help I didn’t want to go online to send a message since I probably wouldn’t get a message back till the next day, at least” (Student 14, NDDL Conference Archives, 1993 -1994). This statement was echoed by other students, and in turn, these feelings put additional pressure on the facilitators who found themselves in the role of mediating the needs of the students and the demands of the mentors. Facilitators stated they often felt helpless to assist students in subjects outside their areas of expertise and, therefore, were made to feel inadequate in facilitating the students’ programs (Facilitator, NDDL Audio conference Notes, 1993 -1994).

Because facilitators had face-to-face contact with the students and the school-based responsibility for their success, it is natural that they would be most concerned about who was directing the instruction. Issues of accountability and tracking came up. In year two, forms were created to record learner progress, but it was still vague as to whose responsibility it was to complete and monitor the forms. Communications between facilitators and students and facilitators and mentors were at times contradictory. Students expressed one thing about their progress while mentors were discovering another. Facilitators found themselves caught in the middle. As facilitators had a limited amount of time assigned to work with the project (.125 FTE usually - 12% of their teaching duties), it was not possible to do all that was asked. Therefore, communication with mentors was often limited.

Mentors discovered that mediation, using new technologies, required an entirely new set of instructional aids (eg. digitised graphs, slides, materials which could be uploaded on the conferencing software for electronic distribution). This presented the problem of preparation time for mentoring, and the challenge of changing pedagogy in the information age. Earlier assumptions about teaching and learning through the use of the new technology were being shaken as the mentors and facilitators wrestled with online delivery. The initial assumption that teaching strategies would be developed as the project progressed put a strain on the teachers involved (Interviews with Mentors 2-4, July 1996).

Students reported that they viewed their course as consisting only of the correspondence papers, and they tended to have mixed feelings as to who was the actual teacher of the course. The arrival of the correspondence materials, potentially encourages the learners to assume a passive role in their learning, suggesting they simply start into the work without contacting their facilitator or joining the NDDL conference first. Depending on the intervention of the facilitator or the mentor, students could open the materials and simply start into the assignments and take the test (E-mail Interviews with Mentor 1, Students 2-5, and Facilitators 1-4, Spring 1996). Therefore,
it is not surprising that students who found the correspondence materials relatively easy had low participation in activities other than those required for formal evaluation, defaulting to the traditional DES methods (Figure 18).

While immediately this does not seem like much of a problem, the opportunity for knowledge-building and participation in a community of learners was limited. I asked one student if she had considered negotiating different, more relevant assignments with her mentor. She responded, "It never crossed my mind that I could do something different than the assignments. The ones that were presented were so easy, I just went through them. It was easy to get the good marks I needed" (Student 3 - Personal Interview, 1996).

Standard correspondence courses commonly are built around 18 papers, which are broken into three blocks, with tests between each block. When that format changed, and the mentor introduced alternative assignments, students became confused and tended to feel that they only needed to complete the "real" assignments - those from DES. Even with the innovative use of technology to deliver courses and the intervention of mentors to mediate the learning, many students saw the DES materials as the course. "It was tough to do the same old course work in this new computer environment - it's not as easy as in the old classroom. If they change the environment then they really should change the course" (Student 3 - Personal Interview, 1996).

The structure of presenting new curriculum and the process for modifying existing curriculum was not clearly defined. The NDDL 1994-95: Phase 2 Review (p. 1) states

Along with the delivery of the existing NDDL courses, the project involved the development of three new courses: Career and Personal Planning 11/12, Information Technology 11/12, and Data Processing 11. These courses were designed specifically for the mediated, technology-based delivery model developed through NDDL. The remaining courses were either redesigned to work with the NDDL model or were enhanced through the development of technology-based tools and resources such as audiographic screens, video or broadcast resources, CD-ROM, and special audio, video, or audiographic 'events' for students.

Structurally, the development and modification of curriculum was a challenge. Mentors were not always involved in the process. Curriculum for one course, Information Technology 11/12, was not written by the instructor. During an audiographic conference early in the 1995-1996 year, Mentor 1 encouraged the students to stay with the course and make the best of it as he was revising the materials later, over the summer. While this is consistent with good teaching practice, it was difficult for students and shook the credibility of the program for both the students and the site facilitators. The facilitator at the site where the instructor explained the need for
the revisions reported an increased frustration level in the students and a sense of distrust (Facilitator 3, E-mail communication, Fall 1996). With their actual teacher at a distance, the students had come to trust the print materials. When these were devalued, credibility in the course was shaken. Students also reported that downloading the assignments from the screen rather than following a book also shook their confidence. "I never realized how much I trusted a book more than pieces of paper" (Student 14, E-mail Communication, Spring 1994).

Steinberg (1994) writes "The ability to collectively create a world out of words stretches the imagination and exercises our intelligence in ways ..." (p. 28) not previously considered. It will obviously take time for students and teachers to adjust to virtual learning environments. The virtual environment should not be used "...as a poor replacement for real life but rather as a way to have experienced that would otherwise be impossible" (p. 28). In other words, the NDDL project needed to create new learning materials to match the innovative online practice it promised. It appears it was an error to upload the old pedagogy of DES materials and hope the mentors could adapt it online.

An NDDL project team member expressed "... concern that while the technology is permissive, the curriculum is too prescriptive. There is too much standardisation of the DES curriculum due to its delivery model" (Project Team 3, Personal communications, Summer Symposium, 1996). Due to budget constraints and limited knowledge of what an online pedagogy could look like, the development of entirely new curriculum for NDDL was prohibitive. A serious question that arises from this research concerns the skills required to facilitate and mentor online education to encourage the development of knowledge-building communities. Without answers to this, the potential for innovative practice is limited by the use of traditional materials.

A further constraint on course flexibility was the movement from strictly non-examinable electives to core, graduation foundation courses (English 12, Physics 12, etc.) In the initial year of operation, NDDL offered only non-examinable elective courses. This meant there was much more flexibility in course content and delivery time. When the project included Ministry examinable courses, a member of the project team noted that "... there was less flexibility with curriculum and delivery. The courses had to be very prescriptive in terms of content and evaluation." In British Columbia, Ministry exams are worth 40% of the learner’s final mark and can be taken only at predetermined times and specific location which limits the potential for asynchronous delivery.

An evaluation document, the 1995 Phase 2 Review, suggested recommendations for the organisational structure, based on the experience from the second year of the project. Porter, Kristijanson, Fallick, Dagert, & Grimsrud (1995, p. 9-10) suggest
• That teacher-mentors be encouraged to establish ‘relationships’ beyond regular course work in order to increase student learning and motivation and that more peer interaction be built into the program.

• That teacher-facilitators should have a greater degree of responsibility to ensure that the students are keeping up and perhaps even some opportunity to contribute to the students evaluation (eg. 10% of marks).

• That students become more actively involved in the delivery of the project (eg. as technology aids, as attendees at OLA sessions or at mini-regional sessions, etc.).

• That the program begins to focus more on individuals and self-directed learning and that an evolution into a more ‘learner-centered’ approach to education become a priority.

• That the program move away from adapting Ministry of Education and Regional Correspondence School curricula and towards a new ‘interactive’ learning paradigm. That research and development go into creating a ‘design team’ that involves students in addition to innovative teachers and thinkers.

It appears that recommendations concerning involving learners in the design model and focusing more on the individuals and self-directed learning were not implemented. For example, during the 1996 Summer symposium, some mentors and facilitators suggested that students be screened prior to enrolling to ensure that they were “... the sort of learners who would be successful in NDDL” (Facilitator 2, Discussion - Summer Symposium, 1996). This statement was not clarified, but the suggestion was made that students needed to be self-motivated, successful, well organised, and academic - in other words, students who had demonstrated success in the traditional school. This was not consistent with the pilot project vision of quality learning experiences for all students in small, rural schools. However, some participants (none from the first year of the project) at the summer symposium felt that the program would be easier to manage if students were “... homogeneous groups of successful, high school learners as the adults and other learners had different needs” (Facilitator 2, Discussion - Summer Symposium, 1996).

Recommendations about a design team were taken to a degree. The project team did develop material, but the time line of the school year and budget constraints did not allow for a total restructuring of curricula. The issue of an increased role for facilitators and their ability to participate in the assessment process was not acted on. Assessment was held by the DES personnel. Marks were sent through DES, and a certificate of completion was distributed. However, some sites reported that when they actually assigned the marks to the student’s permanent record card they made modifications they
saw fit, often ignoring the DES final marks. While there was no stated policy or direction from the NDDL project or DES suggesting this, some facilitators did not wait for the project to empower them; they quietly made site-based decisions, depending on their own personal agency.

The first suggestion, the development of teacher-mentor relationships, is a huge variable. The differences in interaction between individuals vary considerably whether in a face-to-face or virtual setting.

Mentioned also in the Phase 2 Review is concern about the use and management of new technology. Facilitators and mentors come to the project with varying amounts of computer expertise. An assumption was made by the project team that both groups of participants would gain comfort with the tools (hardware and software) as the project went along. Even though the project team developed training guides and offered technical support, the technology often changed faster than the participants and curriculum could adapt. Each year different pieces of hardware and software were added to the program. Students expressed frustration with response delays, and mentors lost assignments or struggled with the various tools to send the materials (Chapter Five - Section D).

As the NDDL project scaled up over the three years and more participants joined, the problems associated with the structural process of the program intensified.

The 1994 Year in Review document states

Preliminary findings of the pilot project indicate that students are being well served by this new delivery model for distance learning. In addition we have gained a better understanding of what is required at each site for NDDL to be most effective. For example, adequate space to accommodate the equipment and for students to work independently; a facilitator to support students and to act as intermediary between the instructors, the Regional Correspondence Schools [DES] and the schools the students are currently attending; and access to technology are among the requirements needed to support distance learning students (Porter et al., 1994, p. 2).

The physical environment at specific sites was critical to the program's success. The facilitator was seen as the essential member of the learning triad in terms of communications and interaction between learners and mentors and the entire program. After the first year of operation, it was stated that "Sites with pro-active facilitators have fewer problems and higher levels of success" (p. 28). Therefore, the key assumption, "... a partnership between teacher-mentors, teacher-facilitators and students will lead to increased success with independent learning" (p. 7) was fulfilled. However, sites with passive facilitators experienced the opposite (Mentor 5, E-mail communication, Fall 1996).
The interactions with mentors were also critical to the program. The issue of how much direct instruction and mentor/learner contact time was questioned continually in the program. It was found that students needed to stay in regular contact with their mentors or they lost their momentum in a course (Discussions, Summer Symposium 1995 & 1996). Once again, the issue of the structure of interactions between participants was a critical variable. Pro-active mentors and facilitators, working with eager students, had successful interactions; other variations produced less or limited interactions which translated into poor success in the program.

With the addition of new sites came a greater variety of learners. Initially developed to support small rural high schools, the NDDL project, by year three, was attracting learning centers who catered to adults or returning learners who came with a variety of skills, needs, and feelings about formal education. Students who had completed courses in the NDDL project identified self-direction, self motivation, good work habits, and good study skills as essential elements for success in the NDDL model.

The introduction of the new students caused concern about the conceptual framework and instructional design. Some facilitators felt both needed modification in order to support adult learners who might not have any of the recommended attributes (Chapter Five, Section B). As well, learners in centers often had different time lines than learners in traditional schools, so tension appeared as the program attempted to address the range. In addition to the adult centers joining the project, many of the new sites were larger, more urban schools. This also put further constraints on the program's design as these larger schools seemed more rigid in terms of timetables and wanted set blocks of time for NDDL programming (Discussion, Summer Symposium 1996). This was in direct contradiction to the asynchronous delivery suggested in the conceptual design.

As the project moved into its third year of operation, participants were interviewed about the project's scalability. Issues of how to promote the NDDL project were addressed, but the actual structural process of how to "get larger" was not. DES principals were critical that "... too much time, energy, personnel, and funds had been expended on NDDL in its present form" (Porter et al., 1995, p. 37). One DES principal at the 1996 summer symposium stated that it was time for NDDL to stop hiding behind its pilot status and start delivering a program and setting standards (DES 1, Discussion, Summer Symposium 1996). Standards and procedures were valued by some participants and viewed as evidence that a project was stable and part of the Ministry program. Participants holding these views ranged from facilitators to mentors to project team personnel, but the majority of the individuals expressing this were facilitators who had recently joined the program. This view is not unique to the NDDL participants. Spender (1995, p. 33) cautions "... everything that is not included
immediately [into the mainstream] becomes non-standard and is soon regarded as
deficient, deviant, not the real thing.” Unfortunately, too often standards become a
form of control, and the ability to modify or innovate becomes further marginalised and
more difficult.

As NDDL scaled up, the project and its communication network was not
adapted or modified to accommodate the increased numbers (Figure 21). Review of the
scaling up process (Figure 23) would suggest that enlarging the project had magnified
the inherent problems.

A final observation from the Phase 2 Review suggests that “... better
communication between project management, schools, and Regional Correspondence
Schools is needed ... [and] ... ways that the learning - model can enhance the working
relationship between mentors and facilitators needs to be explored” (p. 39). This note
reflects that communication and interaction needed to be improved. The relationships
between participants and their roles and responsibilities was still vague. Concern about
communications and organisational structure are consistent with the literature on group
work and organisational learning. By year three, the inability of the project team to
detect errors and correct problems impacted directly on the organisation’s ability to learn
and promote innovative practice.

It appears that when the OLA project team could not address the organisational
problems associated with the conceptual framework to the satisfaction of the other team
members, DES moved in. During the 1996 summer symposium, the traditional
providers of distance education (DES) took a more vocal role in the proceedings and
proposed strategies to expedite the NDDL conceptual design and instructional model
(DES 1 & DES 2, Discussions, Summer Symposium, July 1996). Their proposals
(scheduling, adherence to DES course content, mentor contracts, etc.) were in direct
contradiction with the innovative practices expressed in the NDDL philosophy and
plunged the program back toward traditional correspondence practice.

Ironically, at the same symposium, Project Team 2, the project coordinator,
presented a forward looking keynote address, reflecting the themes presented by
Negroponte (1995) in Being Digital. Project Team 2 states that educators must learn to
think differently in the digital world. Integration, digitalisation, and compression are
essential to the new model of instruction as learning can be independent of time and
place, available to learners at various stages of learning, and able to utilise the most
appropriate technology. While this seems true and consistent with the research
literature on both information technology (IT) and learning, the organisational structure
that was dictating the actual practice of the NDDL project by 1996 appears to have
limited its potential for innovation (Research notes, 1995 - 1996).

By the summer of 1996, the project had scaled up to such a degree that the
majority of the participants were no longer early adopters (Rogers, 1983) of either
technology or the NDDL model, many had no concept of the origins of the project, the communication network was over extended, and the organisation had lost its ability to learn along with its participants (Facilitators 1 - 4; Mentors 1, 3, 5; OLA Staff 1; Project Team 2 & 3, Interviews, July 1996). NDDL had returned to traditional DES practice (Figure 23).

Relationship Among Participants

The second issue presented in the New Directions in Distance Learning - Interim Report questions the relationship and interaction among teacher-mentors, site facilitators, students, and the project team. From my point of view as a participant, in the initial year of operation, the NDDL project functioned more as an organisation (as defined by Senge, 1990) than a bureaucracy. The supporting documentation (faxes, audio conference notes, project handbook) from 1993 -1994 suggest decision making, other than hardware, software, and course materials, was developmental and responsive to problems as they arose. This openness and flexibility was a strength of the program design as errors could be detected and modifications made as needed. Participants could give direct feedback to the project team. Consequently, there was a direct correlation between the theories-in-use, the cognitive and organisational artefacts (models, charts, forms, etc.), and the actual practice.

In October 1994, a Contractor’s Report was sent from the project team to the DES principals. This report outlines the services provided by NDDL to the sites. The final section describes the plan for field support. It explains that site visits took place by project team members and that regular audio conferences were planned. However, it suggests that a series of training sessions, using the telecommunications technology, would be developed. The need for these sessions arose from the site visits and were requested by the mentors and facilitators. This did not happen other than at the summer symposiums. It is understandable that time did not permit the small project team to act on all the recommendations offered from the triad members, but it detracted from the credibility of the team and suggested that input from participants might not be utilised in program modifications (Facilitators 1 - 4 and Mentors 2 -7, Interviews, Fall 1996).

During a site visit, one facilitator reported to the project team

I felt more confident last year [first year of project], felt there was a clearer vision, and that this year [1994 - 1995] there are too many players involved. The students get quickly discouraged with the lack of computer conferencing, but I’m trying to deliver the courses and assignments via the traditional methods until the technical problems are solved (Rollins, 1994, p. 1).
This comment reflects the concern of facilitators and indicates the pressure they are under to deliver programming to their learners. Because they are site based, they are on the front line and had to fill in and deal face-to-face with the students if something went wrong with the program delivery. It also suggests that the physical presence of individuals is often more compelling than a virtual presence as the facilitator was the member of the learning triad on site to explain technical problems or e-mail communications from mentors.

In the second and third year of operation, the project scaled up (Figure 25).

<table>
<thead>
<tr>
<th>Year</th>
<th>Courses</th>
<th>Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>1995</td>
<td>20</td>
<td>34</td>
</tr>
</tbody>
</table>

**Figure 25.** Scale up NDDL (courses and sites)

Figure 26 presents the shift in structural attributes from year one and three which were identifiable from participant comments or the organisation artefacts.

<table>
<thead>
<tr>
<th>Year One - STRUCTURAL ATTRIBUTE</th>
<th>Year Three - STRUCTURAL ATTRIBUTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negotiated conceptual framework</td>
<td>Defined conceptual framework</td>
</tr>
<tr>
<td>Negotiated instructional model</td>
<td>Defined instructional model</td>
</tr>
<tr>
<td>Strength in diversity - varied opinions / methods welcomed</td>
<td>Strength in standardised structure and set of procedures / forms</td>
</tr>
<tr>
<td>Open to organic change</td>
<td>Organic change viewed as a liability or sign of weakness</td>
</tr>
<tr>
<td>Flat, open organisation</td>
<td>Entrenched hierarchy - turf divided</td>
</tr>
<tr>
<td>Targeted at small, rural schools</td>
<td>Open to any site with technology requirements</td>
</tr>
<tr>
<td>Facilitators / mentors professionally able to modify and change to meet site requirements</td>
<td>Facilitators / mentors functioning within curriculum and procedural guidelines</td>
</tr>
</tbody>
</table>

**Figure 26.** Comparison of structural attributes (years one and three)

Scaling up the project appears to have caused the project team to default an operational hierarchy (a pyramid of power) reducing the degree to which the model was flexible and the participants encouraged to function as a cooperative team. The assumptions on which year one was based, "... communications technologies ... bridge distance" (New Directions in Distance Learning - Interim Report, 1994, p. 15) and "... the best features of independent learning ... augmented by the best features of direct teaching, including student pacing and ongoing monitoring of learning" became lost in issues of process and procedure. Based on my participation, interviews, discussions at summer
sympoziums, and online communications, it appears the scaling up process by year three diluted the strengths of the program and entrenched a revised model of NDDL into the institutional bureaucracy of traditional distance education.

The facilitators appear to be an early casualty of the scaling up process. "Site facilitators were recognised at the outset of the NDDL project as being key members of an instructional triad..." (p. 16). Facilitators reported that their actual jobs had expanded well beyond the six roles presented in the project handbook. They stated that they needed to have expertise in technology, the workings of distance education, counselling (both personal and career), motivating, advocating for the learners, teaching study skills, tracking progress and maintaining program accountability, and creating a learning environment which was quite different from the traditional classroom (Facilitators 1-4, E-mail Interviews, Spring 1996).

Facilitators requested more regularly scheduled audio conferences to discuss these issues, a debriefing meeting at the end of the year to bring the project participants physically together, an opportunity to talk about the evaluative comments made to assess the pilot year with the idea of learning from each other's experiences, and an opportunity to have input into a checklist which would be developed to track learner progress (Research notes and Minutes from Facilitators’ Audio Conference Minutes, 1994-1995). These requests were not acted on. In the language of learning organisations, the facilitators were asking permission to come together and launch into an inquiry of the organisational structure and to engage in an organisational dialectic that would allow the project to detect the errors that were arising and correct them. Unfortunately, the facilitators were not able to come together again until the summer conference in August. At that time, they did not meet together formally to brief about the year and plan for the future. Possibly because of the size of the NDDL group, all members did not meet together to discuss the previous year. Therefore, there was no mechanism to discuss with the project team and members of other groups perceptions about the program. The lack of group discourse affected the ability of project team to learn from the participants. Information was gained from evaluations or individual conversations with participants; group discourse did not take place.

The revised Project Handbook, developed for the 1994 - 1995 year, defined the role of teacher-mentor. The mentor was to add

... expertise to existing course material and ensure student success. You will be expected to provide clarification of course content, conduct tutorial and remedial sessions with students, maintain contact with students and teacher-facilitators, assess student assignments submissions, track student progress in cooperation with on-site teacher-facilitators, and incorporate the appropriate resources and technologies into your teaching strategies

The handbook also states mentors "... will be encouraged to expand [their] ... knowledge of all these technologies [audio, audiographics, computer conferences] at the training sessions and throughout the academic year, with the help of the project team" (p. 2). Instructions were included illustrating how to establish and maintain weekly mentor-facilitator contact, weekly mentor-student contact, remedial tutoring, communications at a distance, record keeping, assessment, and conference moderation. These instructions were presented in nine pages of text which provided more of an suggestion that they should be done than strategies and proven methods of how to do them.

As in traditional teaching, the abilities and skills of the mentors varied; consequently, the mentors' ability to adapt to the new medium varied. None of the mentors came with any prior online experience (Mentor 1 - 8, Interviews, Summer Symposium 1995, 1996). While this will be discussed further in Section B, one of the major design flaws in the triad model was the project team's inability to hire mentors. DES hired the mentors, usually reassigning them from their traditional positions in distance education. Therefore, mentors were not selected on their ability to teach online and often had no input into the design of the course materials. Basically, they were there to mediate the DES program and sort out a method of doing that online.

The slippage, in terms of assuming that mentors had the necessary skills required to function online, and the loss of agency, in terms of mediating someone else's materials, disempowered some of the mentors (Mentor 3 & 6, Interview, Summer Symposium 1996). Sites reported student comments such as "It was like this guy was just a marker not a teacher. If I was going to take this course again - I'd learn the stuff before I started" (Student 14, E-mail Interview, Fall 1995). However, other mentors were reported as being clear, wonderful, committed, subject experts, etc.

One such mentor, Sandra Hawkins (1996, p. 1) explains how the participants function in NDDL.

We work as a triad: student, mentor and facilitator. This triad model is vital to the success of the project. The facilitator works at the site where the student is based - often a school in a remote area of the province. The facilitator ensures the student has the necessary technology, technology skills, and materials to work through the course. The mentor works with the facilitator to do the best job possible for the student, who is the focus of the triad. The student utilises both the facilitator and mentor to accomplish educational goals.
Hawkin's understanding of the essential link among the triad members is at the heart of the conceptual and instructional model of NDDL. She understands the connection between the process of the structure and the goal of the project - learning.

However, the quality of mentors and facilitators was not evaluated or officially reviewed. Because the project team had not hired the mentors or the facilitators, they were not allowed to craft a job description or determine an assessment/evaluation guide (Project Team 3, E-mail Communication, Fall 1995). Students were at the mercy of the site or course assigned teacher. In one case, a student reported:

I didn't know I really had a site facilitator. The vice-principal said he would help if I needed it, but I didn't know he was supposed to help me. I had to find him if I wanted to log on or even get in the classroom where the NDDL computer was. Mentor 5 was great as a mentor. She was really interested in Law and totally knowledgeable about the subject. She really seemed to have lots of time for us and was interested in what we were doing (Student 3 - Personal Interview, July 1996).

An interesting note, the administrator described above was in fact the designated site facilitator. NDDL ensured that each district participating had filled out a commitment form which guaranteed district technology support and site based facilitation of at least .125 FTE (roughly 12% of the instructional day). Based on the reports from facilitators, this is not enough time to do the job well (Facilitators 1 - 4, E-mail Communications, Spring 1996).

During the 1995 and 1996 summer symposiums, triad members met in small, mixed groups which included a few of all the various stakeholders. Separate meetings for mentors and facilitators were not held, nor were there discussion meetings for all the groups together. Printed, bound guides were given out as supplements for the binders which defined the roles of the triad members. Notable is the fact that the other stakeholders in the project (the project team, Ministry of Education, and Distance Education principals) did not have a guide outlining their roles. These groups were not included in the triad model although they had a major impact on the instructional design. Their roles, and the relationship between them and other participants, were not officially stated.

The Academic Year

A third issue presented in the Interim Report was the definition of the academic year. Once statements concerning independent learning had been made, and the decision to provide "... flexibility in course design so that teaching and learning can be customised to meet the needs of students and teachers" (New Directions in Distance Learning - Project Handbook, p. 2) had been made, the notion of the traditional
academic year had been challenged. Some students and facilitators welcomed the opportunity of self-paced learning; however, the flexibility to negotiate it was gone due to the change in the organisational structure. Some sites had insisted on structuring instructional time into set blocks. Figure 26 suggests flexibility and negotiation have been replaced by standardisation and procedure.

Sandra Hawkins, one of the original NDDL mentors, reports

When I learned that several students in my ... course were involved in conservation training, I changed some of the topics of the audio conference offered that year to those which would complement the conservation programme. Flexibility is definitely a component of good mentoring (Hawkins, 1996, p. 7).

Little evidence of that flexibility is evident in the 1995 - 1996 Law 12 which is studied for this research. During that year the number of students taking the course had increased from 13 to 23, and the mentor had to compete for audio conferencing time with the other courses offered in the project. Scheduling audio conferences had become more complicated as more participants from additional sites added their site timetables to the scheduling challenges (Mentor 5, E-mail Communication, Fall 1995).

The delivery model shifted from the mentors and facilitators being able to negotiate a student's progress to the distance education centers dictating schedules. Mentors could no longer agree to carry students over from one academic year to the next. Self paced, asynchronous learning had been limited. Principals at DES, who were employing the mentors, were concerned with time lines and the duration of mentor contracts. By year three, the needs of the system (contracts of employment, hiring schedules) were dictating the instructional and conceptual model of the program (DES principals, Discussion, Summer Symposium 1995, 1996).

In year two, the Project Handbook included a graphic describing the triad model. It showed learners, teacher-mentors, and teacher facilitators in an interactive triad of communication. By year three, this model did not reflect the actual practice as the project team, MoEd, and DES had major impact on the learning model, but did not appear on the diagram. Figure 27 illustrates the actual practice.

![Figure 27. Revised learning triad (one)](image-url)
However, as Project Team 1 and Mentor 8 stated (Summer Symposium 1996), "... the triad model in any form is almost a false metaphor as the distance education schools (DES) and the Ministry of Education are missing from the design" (NDDL 1995 - 1996 Conference Archives). A truer representation for the 1996 - 1997 year would be Figure 28. (Note: the term learner and student is used interchangeably within NDDL.

**Figure 28.** Revised learning triad (two)

It appears that the project team had anticipated the scaling up process would put stress on the organisation. In a Questions and Answers document (New Directions in Distance Learning - Project Handbook 1995-1996, p. 1) the following question and answer was presented

How can we grow without losing flexibility - the biggest asset of the program?

The long term plan is to replicate the model locally or regionally, which would keep the scale manageable for those areas. The Ministry would still provide resources and training in collaboration with OLA, RCS [DES], and others.

Unfortunately, the regional or local model had not been created as of June, 1997.

In the scaling up process (Figure 23, Steps Three - Five), the flexibility of self-paced instruction, previously offered, was lost. During the 1996 Summer Symposium a heated discussion erupted concerning the issue of standardised reporting forms and times. One proposal suggested developing a WEB based database to which only facilitators and mentors would have access. DES then asserted that they should have access as well. This WEB site could be used to track student progress, making sure that all students were proceeding at the recommended place. All assignments would have clear assignment values stated on the WEB so people could immediately assess a student's course completion. (Facilitators' Workshop, Discussion, Summer Symposium, 1996).
A further suggestion was made not to use a database but rather a spreadsheet which could continually tally student success. Notably absent from this discussion were any of the original facilitators and mentors from the first year of the pilot. Innovative, self-paced, student negotiated learning was being modified into an accounting problem, reducing the opportunity for authentic assessment and student negotiated demonstrations of learning to number crunching. The goal of this discussion was the tracking of students and establishment of standards of instruction and a timeline for operation. This goal and its actions were in direct opposition of the initial theory-in-action of the NDDL project. It suggests also that the newer members of the organisation were unaware of the history (organisational memory) of the project and the reason it had been created in the first place.

NDDL’s lack of an organisational memory and a collective review of its theories-in-action possibly lead to the individual groups (new mentors, new facilitators, etc.) deviating so far from the original vision of the project. It also appears that the lack of communication among members prevented the transfer of previous knowledge. New members (year two - four participants) joined the project, assessed their success with the instructional design, and then defaulted to traditional practice if their assessment determined negative results (Step Four, Figure 23).

During Steps Three - Five (Figure 23), it became increasingly apparent that DES was attempting to affect the structure of the instructional model by controlling the academic year due to its contracts with the mentors. While DES had always held control of the distribution of materials and the enrolment procedures, they had not previously exercised their control over course completion time and mentor contracts. This further restricted the facilitators’ and mentors’ ability to negotiate and advocate for their learners. Enrolment had to take place at certain times in the year, which restricted the learners’ opportunity to finish a course on a self-paced schedule and enrol in the next. Because of the way in which mentors were hired, it could not be guaranteed that courses could be carried over into the following school year, and even if they were, students needed to re-enrolling and sites had to repay fees.

An example of this occurred during the last few weeks of the 1995 - 1996 school year. OLA Staff 1 sent the following message

**Wednesday, June 12, 1996 2:06:36 PM**

**Message**

**From:** OLA Staff 1  
**Subject:** “Unfinished” students  
**To:** Mentors  

We are beginning to hear of students who are have problems finishing their NDDL courses, and are wondering how widespread a problem this is.

Could you please reply to me and let me know the numbers of students you think won’t finish and their sites. We don’t need specific names.
Thanks for taking the time to do this.
OLA Staff 1

Wednesday, June 12, 1996 3:45:22 PM
Message
From: OLA Staff 1
Subject: re(2): "Unfinished" students
To: Mentor 1
Cc: Mentors

do you want numbers as compared to the initial course rosters or numbers of students that have actually done some assignments, but are unlikely to finish?
Mentor 1

Is it difficult to do both? chances are some withdrew, and I wasn’t informed. If it’s hard, just those that started, but might not finish as you now see it.

The responses rolled in. Some mentors had students who had not started any of the material but were still on the course roster and somehow had slipped through the system; some students had completed varying amounts of work but could not realistically complete by the end of June. The mentor who had raised this question to OLA Staff 1 added

Thursday, June 13, 1996 8:20:05 AM
Message
From: Mentor 2
Subject: Re(2): “Unfinished” students
To: OLA Staff 1
Cc: Mentors
Wow, looks like I opened a kettle of worms, OLA Staff 1.

Out of the 27 Calculus students
1. Some students just dropped out/stopped working, or I was informed by a facilitator that they had dropped out. I’m not going to worry about these student trying to finish by end of June.

2. Presently I have about 10 who have indicated they’d like to finish up over the summer ...

Could/should these students be turned over to the enrolling DES, and marking and arrangements for taking tests during the summer be made by what ever means the enrolling DES uses for its summer In-school students?

One of the mentors, who really wrestled all year with the notion of self-paced learning, used this conference interaction as a time to express some thoughts on the delivery model

Thursday, June 13, 1996 9:50:54 AM
Message
From: Mentor 3
Subject: Re: “Unfinished” students
To: OLA Staff 1
Cc: Mentors

[included details about student enrollment]

Several of these [students who had not started the course] I have made contact with and they are adults who intend to do another course or courses first and then do the math. They seem to be having difficulties with their dreams, and have not gotten to the math. I think some of the community education centres have bought positions for the students prematurely with the thought that they could only buy in at one time during the year. For the Math 11, I suggest that we might consider advertising two, three, or four times for starting the program during the year. I am interested in how one might organize the teaching sessions with repeats so that students can proceed at different rates and students who are slow could drop back to a later group while students who are working fast could jump ahead or sit in with two groups. In time, course enrollment could grow to 30 to 100 with the same teacher, giving interesting possibilities in scheduling. The community education centres could order courses when needed, and the number of students enrolled in the course would become more meaningful. This is all part of the experimental process, isn’t it? Comment if you have time, and leave it as something to think about if you haven’t.

There was no response or comment on Mentor 3’s suggestion/question, but OLA Staff 1 did reply to Mentor 2.

Thursday, June 13, 1996 12:03:16 PM
Message
From: OLA Staff 1
Subject: Re(3): “Unfinished” students
To: Mentor 2
Cc: Mentors

Mentor 2, you actually didn’t open the can; a more apt description would be that you were the proverbial straw. Other mentors were beginning to notice this. As we have gotten bigger, we will have more unfinished students.

We are discussing this problem - I don’t know that these students can be turned over to the DES school. This is going to involve hiring and paying markers, and I don’t think NDDL has a budget to do this.

Monday, June 17, 1996 12:35:29 PM
Message
From: Mentor 2
Subject: Re(2): “Unfinished” students
To: OLA Staff 1
Cc: Mentors

Grade 12 students in schools have a ‘last day’ in school this coming Wednesday. We need to be able to tell them, no later than then, how they can continue their NDDL courses over the summer. I don’t believe ‘we’ told students that they had to finish their courses by June 30; and usually DE students can take more than a year to finish their courses.

Monday, June 17, 1996 1:28:22 PM
Message
From: Mentor 1
Subject: Re(3): “Unfinished” students
To: Mentor 2
Cc: OLA Staff 1

Mentors
I have been telling students that the last day is this Friday, June the 21st. I also would say that there is a clear understanding that NDDL students have to finish their courses within the given school year. That has always been an expectation. There is no defined mechanism for carrying over courses although some principals have been letting students switch to regular correspondence - that also means that the local DE school is on the hook for clerical time and marker payments. There will be no 'extra' NDDL funding to cover that scenario.

Mentor 1

Monday, June 17, 1996 3:26:45 PM
Message
From: Project Team 3
Subject: Re(4): “Unfinished” students
To: OLA Staff 1
Cc: Mentor 2

Mentors
The NDDL model provides students with a great deal of support, but it isn’t correspondence, it is mediated, supported but *self-directed* model in which students are required to take responsibility for their own learning. While they have support from an on-site teacher as well as a distant teacher they really must be able to complete the course work within the time frame of the project.

It has been made abundantly clear throughout this project that June is the deadline for course completion.

We cannot expect the DESchools to take on an additional expense to cover students who have not participated throughout the course and are only noticing at the end of the year that they aren’t finished. I would have to say that incomplete courses receive an Incomplete grade at the end of June.

Tuesday, June 18, 1996 1:56:53 PM
Message
From: Mentor 4
Subject: Re(3): “Unfinished” students
To: Mentor 2
Cc: Mentors

I agree with you Mentor 2. It was not totally clear in my mind last August that everything had to be completed by June 30. But I was a new-comer to mentoring.
But if I was a new-comer .. what about the students?

Tuesday, June 18, 1996 3:46:12 PM
Message
From: Mentor 2
Subject: Re(4): “Unfinished” students
To: Mentors
Cc: OLA Staff 1

A lot of input...but what do we tell facilitators by tomorrow! Should we be consistent? Or just play it by ear?

Tuesday, June 18, 1996 4:08:04 PM
Message
From: Mentor 1
Re(5): “Unfinished” students

Mentor 2 writes:
A lot of input...but what do we tell facilitators by tomorrow! Should we be consistent? Or just play it by ear?

The facilitators have given (or should have) you a date by which they require marks by. I guess you need to give yourself some time to prepare those marks - I have been saying June 21 is the cut off. I wouldn't want to see you with a bunch of assignments submitted on June 28th and also have the facilitator/principal want marks on that day.

I suggest for next year, we make the cut-off for submissions, the last day of regular classes in ‘normal’ schools. That should be more than fair to everyone.

I don't know about the rest of you, but I don't get paid to mark assignments or deal with students over the summer. Next September, we will have new classed of students to deal with. I would have no problem accepting one of this years students in next year’s class if they wished to complete - assuming I have that course and that they pay the course fee again. Our salaries for next year are partially off-set by enrollment in the courses. It takes about 25 NDDL students to pay for a teacher for one class.

Mentor 1

Tuesday, June 18, 1996 4:55:23 PM
Message
From: Mentor 5
Subject: Re(6): ‘Unfinished’ students
To: OLA Staff 1
Mentors
Project Team 3
Project Team 2
Project Team 1

I agree with Mentor 1 re: having the last day of school the cut-off date, but that would be for students who do not have provincial exams and who have already complete substantial portions of their courses. I need to know a week or two before the exam what special tutorials the students will need, and I need time to give those tutorials. In En. 12 I have five individual tutorials of 1 to 1 1/2 hours with three of the four students who will write the exam. (The fourth sent me 75% of the course one day at the end of May and didn't respond to my offer of a tutorial.) I think these kids who take advantage of what we offer at NDDL are getting better service than they would in a regular course because they are getting personalized tutorials and lost of individual help along the way.

Also, next year I will say that 50% of the course must be done in April, 75% in May, and the rest by mid-June. I can't possibly mark an entire year's work in the four courses I will be teaching on the last day of classes, nor do I think it is a good learning situation. We are being paid to mentor and much of my mentoring is done by individual comments on student assignments. I am not a mentor, but a mere dumping ground if I accept
100% of the course assignments on the last day of class. (I am also a basket case if that happens!)

[specific examples are given re problems with technology]

If NDDL is to be more than a joke, we need to set standards--give excellent service. I believe that can only be done when we have thoughtful policies in place--stick to them--except in situation in which we know the policies should not apply. (Yes, I am carrying two student next year at no cost to NDDL because I believe they really deserve extra consideration.)

More at Silver Star--back to piles of files--even though I did set the June 14th date!

Regards,
Mentor 5

Two related comments were added to the discussion. Two mentors explained that they too would be carrying over students into the next school year at no cost. OLA Staff 1 forwarded a comment from Project Team 1, which stated "I've been pretty clear all along that our funding was linked to finishing on time and that people who need summer to finish must be part of separately negotiated agreements between sites and DE schools" (New Directions in Distance Learning - Conference Messages, 1995 -1996).

This exchange reflects the hierarchy and structural process for handling problems. A concern was brought to the attention of the project team by a member of the learning triad. OLA Staff 1 engaged in organisational inquiry to determine how wide-spread the problem was. Unfortunately, when one of the mentors, Mentor 3, presented a creative solution, his comments went unanswered, and he did not contribute further to the discussion. Mentor 1, a mentor but also a member of the project team, responded in a manner Argyris (1993) would define as a defensive routine. Mentor 1 couched the response in jargon related to routines and bureaucracy (budget, ownership of problem, process).

Mentor 2 questioned the assumption that all participants in the program realised the NDDL academic year was tied to the traditional school year. He pointed out how the routines within the DES system (carrying course work over into the summer) differed from the NDDL plan. Mentor 1’s next response still reflected the defensive routine, using words such as “clear understanding” and “always been an expectation.” Project Team 3, one of the senior project team members, carried Mentor 1’s words further by adding the support of the hierarchy to his statement. While Project Team 3’s response reflected the stated philosophy of the NDDL project (*self-directed* learning and student ownership of learning), it seems that it was the wrong time to assign responsibility for both attributes to the participants with the least agency - the learners. With ten days left in the program, the triad members had detected a major problem in the organisational structure. The organisational hierarchy offered no correction for the
problems, so the members in the field had to make adjustments in their theories-in-action to reflect the actual theory-in-use they needed to complete their tasks.

After the responses from the hierarchy, it is interesting to note that Mentor 4 directed his comment away from the project team and to a fellow mentor, copying it to all the mentors. The statement supports a triad member and suggests that if mentors didn’t understand the assumptions, how could the students and facilitators be expected to understand. Mentor 2, the mentor who brought the question to light, then asks the practical question - What do we do? Members of the project team exited the conversation and Mentor 2’s question was left unanswered.

Mentor 5, the only facilitator in the discussion who has been with the project since the beginning, adds her perspective to the problem and offers constructive comments concerning the place of policy (routine) in the program. Her comment was not specifically commented on any further, and the discussion seemed to be tabled until the Summer Symposium which was to be held a few weeks later at Silver Star.

The issue presented above clearly shows that assumptions and expectations of the project team (eg. the school year ends in June) were not understood by all the participants. Previous information (organisational artefacts in handbooks and promotional materials) had offered self-paced learning and/or modified learning opportunities to NDDL participants. However, the operating structure of the NDDL organisational system (salary, time frame, DES contracts, etc.) put the theories-in-action in conflict with the actual theories-in-use. When the assumptions were challenged, the NDDL project team had to resort to defensive routines which attempted to protected itself and re-directed the problem. Argyris’ view (1993) that defensive routines limit learning and prevent an organisation from becoming a learning organisation is supported. Mentor 3, who presented a creative solution, never received acknowledgment of that contribution. The residue from this discussion carried over into the 1996 Summer Symposium that was held 21 days later.

Project Scheduling

The fourth issue presented in the Interim Report targeted the mentors and facilitators’ ability to schedule audio conferences and audiographic conferences at specific sites. Mentors attempted to organise conferences to maximise their contact with the greatest number of students. Rather than offer the same conference for each site, the project team and mentors wanted to coordinate their schedules to encourage the development of a community of learners and to be expedient. This caused conflict with the existing school timetable and started to defeat the principle of asynchronous delivery of courses and self-pacing.
By the 1995-1996 year, emphasis was being placed on the need for NDDL courses to be slotted into the individual sites' timetables. The notion of self-paced, asynchronous learning became the second casualty of the scaling up process. Facilitators reported that students often had to miss traditional courses in order to attend conferences. "... whenever we had a conference it was during one of our blocks, so I couldn't go all the time and I had to miss class. It was hard" (Student 15, E-mail Communication, Spring 1995). Students also reported problems balancing their work in the traditional classrooms and their work in NDDL. One stated "... I'm just a kid and I am busy with lots of stuff. I did the stuff first for the teachers who were hassling me" (Student 16, E-mail Communication, Spring 1995), meaning the face to face teacher.

As more conferences, mentors, and sites were added to the program, the demand on the OLA bridge (connector for multi-site audio conferences) to support the conferences increased. Mentors and facilitators had less flexibility in scheduling suitable conference times (OLA Staff 4, E-mail Communication, Fall 1995).

Technical issues also affected the scheduling of conferences. Sites with poor telecommunications links slowed multi-site audiographic conferences to an unworkable speed (Mentor 1 & Facilitator 3, E-mail Communications, Fall 1995). These sites were offered point-to-point conferences (one site connected with one mentor). This not only put additional demand on the schedule, but it also affected the development of a community of learners. Learners in low band width sites were once again a community of themselves, and it often was the small, rural sites who had the bandwidth problems. Once again, these learners were isolated into communities of themselves while the larger centers were connected to the bigger learning community. The notion of a virtual community of learners (part of the first vision and theory-in-action) became a third casualty as the project scaled up, and the project team sought newer technology to support the increased numbers and take advantage of technical advances.

The NDDL Law 12 course, the focus of this research, pre-set a schedule of audio conferences. In the opening message which students found when they initially logged on to the system, Law Mentor states, "We will have our major audio conferences this year - some with guests engaged in legal professions. The rest of the time we will chat here and also work independently" (Law 12 Online Conference Message, Fall 1995). A month later, Law Mentor was ready for the first audio conference.

Monday, October 9, 1995 8:19:01 PM
Law 12 Forum Item
From: Law Mentor
Subject: Audio #1
Hello Legal Beagles!
I am waiting to get a neat piece of machinery called a Paper Port, before I start any case discussions here. I have lots of cases that we’ll be discussing typed out, but not on hard drive or disk, just now.

Also, it’s time to schedule our first audio conference—this will simply be an introduction to the course, your classmates, and moi! Please let me know if you can be available on Friday—the 13th!—at 10:30 a.m.

Please tell me what number you can be reached at and, who else will be at that site, if you have a number of your taking Law 12 there. If you can’t make 10:30, please let me know some times next week that will be good for you. I will schedule a couple of introductory conferences if I need to.

In the meantime, get cracking on the introduction to Law Unit—and ask any questions you have here.

Hope you all had a good Thanksgiving!

Regards,
Law Mentor

This message is typical of the process to determine a conference date. Law Mentor received numerous messages, and it was determined that the Friday date was not workable. As the project scaled up, the number of learners made scheduling difficult. The first conference did not take place until November 3rd. A second conference took place before Christmas vacation.

As the students increasingly were at different places in the course curriculum, Law Mentor had to make adjustments in the audio conference format.

Monday, January 8, 1996 11:00:26 PM
Law 12 Forum Item
From: Law Mentor
Subject: First Case for Audio
To: Law 12 Forum
Because we have so many students in Law 12—at different spots in the course, I have decided to try something a little different for our audio conferences. We will still be discussing cases, but rather than concentrate on the Charter at this point, I will give you three cases to discuss at our next audio. It won’t matter where you are in the Law 12 course—just read the case and decide what you think should happen.

The cases are real—I have changed some names and a few details in places, but nothing major.

[An actual case followed in this message]

There was confusion about the date for audio conference.

Monday, January 9, 1996 10:15:31 AM
Law 12 Forum Item
From: Student 1
Subject: audio conf
To: Law 12 Forum
Law Mentor is the audio conference on the 15 or the 17th of January. I am confused. Karen

Monday, January 9, 1996 3:54:47 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re: audio conf
To: Law 12 Forum
It's probably my confusion, Karen--trying to schedule three in one week.
It's scheduled for Jan. 17 - Wednesday--9:30 a.m.

Balancing the course load, mentoring individual students, and scheduling audio conferences for different groups was a challenge. In Law Mentor's case, she was also teaching three NDDL courses, so presumably she was scheduling similar events in the other two courses as well. The audio conferences were generally well received by the learners. Sites reported that mentors who had regular conferences with the students had better success.

Wednesday, January 17, 1996 10:54:43 AM
Law 12 Forum Item
From: Student 1
Subject: audioconference
To: Law 12 Forum
Law Mentor I thought today was very beneficial to me and would like to see it continued weekly if possible. I find I learn more by talking about the subject rather then read. Keep up the good work. Student 1

Wednesday, January 17, 1996 11:56:04 AM
Law 12 Forum Item
From: Student 2
Subject: audioconference
To: Law 12 Forum
Law Mentor I enjoyed today's audioconference yes I would like to do this ones a week BUT I'm wondering if we can do it a later time like at 11:00 am because I'm in lifeskills from 9:00am till 11:00 am for even weeks can you please get back to me a.s.a.p. thanks Student 2

Wednesday, January 17, 1996 2:12:50 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re: audioconference
To: Law 12 Forum
Thanks for your quick replies, Student 2 and Student 1. I am not sure we can do an audioconference like the one we did today every week. What I would like to do is put a case on every week and have you respond to my questions here--an online discussion. Then every two or three weeks, we will have an audio similar to the one we did today. Actually, today was one of my favorite audioconferences of all times because there was so much active participation on all sites. I really felt you were all with me. Yes, we will have to try for more like that!

Student 2, I can try to schedule my audioconferences later, but it depends on my teaching schedule and when the audio conferences are free--lots of thinks to try to work out.
Regards,
Law Mentor

The two students presented specific issues related to their learning styles. However, due to time constraints, Law Mentor had to resort to computer conferencing - the text based medium Student 1 expressed a desire to avoid. The next audio conference did not take place until April 16th, and it was related to careers in Law not specifically course material. Student 1 eventually dropped out of the course but has re-enrolled for the 1996-1997 school year with Law Mentor's permission. Student 1 still feels that increased audio conferences would have kept her more involved in the material. The final audio conference took place on May 29th. It was a modified mock trial of a case from the Law 12 curriculum; however, by this time some of the students had completed the course or dropped out (Law Mentor and Student 1, E-mail Communication, Spring 1996).

Problem and Dispute Resolution

The fifth issue raised in the Interim Report concerns the manner in which conflicts, errors, technical problems were handled. In the first year of the project, they were addressed in a very open manner and usually presented during regular audio conferences or direct phone calls to project team members. Participants were also encouraged to phone Project Team 4, one of the project team, with any concerns not addressed in the faxes, guides, or audio conferences. This gesture flattened the hierarchy and made all participants feel they had access to information and assistance.

Project Team 4's enthusiasm and warmth supported the participants and made individuals feel that no question was too small or too simple to answer. During an audio conference this enthusiasm was evident when he explained the evaluation of the project as "... a formative evaluation process: Let's find out how we're doing, not what we did" (Project Team 4, E-mail Communications, Spring 1994). He continued by explaining that "... we should use the formative evaluation to celebrate what's going well and as the pilot evolves, nudge and make modifications where required."

This level of warmth and openness about the project model encouraged many participants and increased the confidence level. Open communications, using whatever means most comfortable to individuals, appeared to keep the participants positive about the project.

As the program scaled up by the 1995 - 1996 school year, communication channels changed; participants were increasingly directed to middle management individuals (OLA Staff or DES staff) for specific problems. Access to the project team was not encouraged, other than via electronic conferencing, and participants were
encouraged to contact specific software vendors or service providers themselves (New Directions in Distance Learning Project Handbook 1995 -1996). At times that was awkward as previous deals or arrangements had been made by the project team, and facilitators and employees at the various found themselves in the middle previously negotiated deals. One situation occurred at several rural sites concerning the use of BC Systems for telephone access. The project team had an arrangement for telecommunications service which involved regional DES reallocating bandwidth and connectivity using BC Systems. As the facilitators did not know the entire arrangement, it became a situation where too many people were involved and few of them had enough information to make informed decisions. The result was that while the regional DES was responsible, the facilitator had to turn to the project team for assistance as learners were having their instruction interrupted and BC Systems was confused as to who to deal with (Facilitator 3, E-mail Communications, Fall 1994). Organisational issues such as this were bound to occur as the project scaled up, but the ability of the organisation to detect these errors and make corrections was limited by a lack of communication between participants.

Connectivity for the rural sites was a major problem. The increasing number of participants in the project forced the project team to delegate responsibilities which often left decisions about operations in the hands of individuals who knew only their piece of the puzzle. Delegating responsibility was probably necessary, but it impacted on the organisation’s ability to engage in systems thinking for important decisions. As connectivity was crucial for communication in the NDDL model, it became one of the most important issues in the project. During the second year, all communication was to be conducted electronically, as much as possible, and directed to the specific person responsible for the issue (New Directions in Distance Learning Project Handbook 1995 -1996). Channelling all project communications into the electronic medium also impacted on the richness of the communications and ability of the organisation to engage in collective discussions about issues (Research Notes, 1994 - 1996).

Recognising that there had been communications problems in the 1993 -1994 school year and anticipating future problems, the 1994 - 1995 Project Handbook had an entire selection of Questions and Answers. This eight page document attempted to anticipate problems / concerns about the NDDL structural model. However, the only discussion about this document took place during the summer symposium where there was limited time to establish a good dialectic process about the issues it raised. Two diagrams, selected from that document, offer visual representations of the communications paths suggested for dispute resolution and process clarification. During the discussion, a few participants became confused by the diagram illustrating marking / reporting process (Research Notes, Summer Symposium, 1995).
This confusion prompted a heated discussion as DES principals expressed their concern about exam security. Facilitators felt capable of issuing and invigilating exams while DES questioned the ability of sites to maintain security and prevent students from electronically sharing exams with students from other sites. This exchange was one of the first, formal disputes concerning ownership of materials and roles and responsibilities.

The issue of tests and test security was the tip of the pedagogical iceberg. DES principals continued the discussion about exam security as they felt they could not be assured that students taking exams at different time periods would keep the information confidential. They were also concerned that sites might inadvertently allow cheating. DES' concern not only suggested that the facilitators were not capable of executing their role, but it put into question the fundamental issue of self-paced student learning, which had been one of NDDL's initial vision statements. Also the assumption that all courses would be tested, and tested with such standardised scrutiny, questioned the philosophical statement of a learning model which had introduced the notion of flexible course design to stimulate different learning modalities. While the expressed concern appeared to be testing, it seemed that the real issue was DES control of curriculum and delivery. This same topic became a heated discussion again at the 1996 Summer symposium.

A second diagram illustrated a response to the hypothetical question "Who is responsible for conflict resolution between teacher-mentors and teacher-facilitators?" The graphic outlines the direct supervisory role of site principals for their facilitators and DES principals for their instructors. Further in the diagram, it was shown that either DES or site principals could contact the project team. This model was probably driven by the need to honour union hierarchies, and also to delegate the responsibility from the project team. Once again, the scaling up of the project distanced the project team from the triad members.

There are other questions and answers presented in the Questions and Answer document, and many became the core of tension which was apparent during the 1996 summer symposium. The questions concerned (1) the scalability of the NDDL conceptual and instructional design model; (2) the notion of asynchronous, self-paced learning; and (3) the issue of continuous entry into courses. Many of the participant responses to these issues reflected a desire to return to the traditional practices of educational delivery. Without a mechanism to engage in organisational dialectic, the project team was unable to communicate with the participants and engage in inquiry about why they wished to reject the innovative model. Therefore, the questions were raised but limited communication took place. Participants left the symposium feeling that the problems had been unresolved (Facilitators 1 - 4; Mentors 2, 3, 5, 7, 8, Discussion, Research Notes, Summer Symposium 1996).
By the third year of NDDL, the guides in the project handbook for the mentors and facilitators did not include phone numbers for generic help. The student guide has a section on where to get help, but the other two guides do not. No where in the contents of the 1995-1996 Project Guide was there a clear help page. While there were specific references for connecting various parts of software and hardware, there was not an invitation for assistance from the project team as there had been in the first year. Telephone numbers are given in a hierarchy of project team, facilitators, mentors, and DES staff, but online communication is encouraged. Participants are informed in the Overview section of the Project Guide that "Facilitators must use electronic mail for primary communication with project personnel. The CLN, NDDL Online (First Class), and the 'nddl-l' group mail list name are provided to meet your electronic mail communication needs" (p. 6).

One major concern, which seems to resist solution, is that NDDL courses did not start immediately when the schools opened in September. This continued to frustrate the facilitators (Facilitators 2-4, E-mail Communications, Spring 1996). Course materials were often late arriving at the sites, technical issues had not been resolved (connectivity or hardware problems), and/or mentors were not ready to start their courses. Facilitators in traditional educational sites found this particularly difficult as they had to struggle to maintain student interest and momentum as they waited for the course to start. The project team wrestled with this problem, but no solution was presented (Project Team 2, Presentation, Summer Symposium 1996).

The ability of the organisation to detect errors and work together to correct them became an increasing concern for the NDDL organisation. Each time an error went uncorrected participants tended to make their personal evaluations of the project and then assess these evaluations either positively or negatively as shown on Step Three of the organisational model (Research Notes, 1995 - 1996).

Without a clear resolution process for issues, participants often felt that many concerns were being left unaddressed. Members began to align themselves with various groups within the organisation and seek support or solutions. These groups sought support for their responses to errors and appeared to start reacting to problems with single-loop solutions that did not reflect systems thinking or an understanding of the origins of the project. This is consistent with the literature of team activity (Cicourel, 1990) as members often reply on the group for solutions and tend to break into smaller groups for support (Argyris & Schon, 1978).

As stated earlier, learning triad members watched rather helplessly during the 1996 summer symposium as DES and OLA fought for control (Facilitators 1 & 3; Mentors 3 & 8, Interviews, Summer Symposium, 1996. It is the conclusion of this research that the NDDL project had stalled as a learning organisation during the third
year of operation and appeared to stop operating as a learning organisation by the end of the 1996 Summer Symposium.

A statement attributed to the superintendent of the Toronto School Board had become true, "As the water hole shrinks, the animals start to view each other differently." By the close of the 1996 school year, the NDDL project had moved from pilot status and needed to seek funding for its programming from traditional institutions. It also was beginning to attract more and more learners to its program as an increasing number of sites joined. The traditional institutions appeared to feel threatened and responded with single-loop responses to the problems presented to them. The fiscal water hole of distance education had begun to shrink.

**Key Conclusions**

By the 1995 - 1996 school year, many of the founding premises of the NDDL project appeared to be no longer guiding its organisational structure. I could find no evidence of communications among the program team and learning triad members concerning organisational policy or reference to the conceptual framework, etc. In reviewing the organisational model (Figure 23), it appears that the organisational structure began to change during the second year of operation. This change can be attributed to the scaling up of the project, but it is the suggestion of this research that the scaling up simply accelerated the process that was already happening. Assumptions made by the project team regarding communications and team interaction appeared to move the project from intuitively being a learning organisation back to a bureaucratic hierarchy. The 1994 -1995 handbook shows a pyramid hierarchy had been formed.

In the initial year of the project, I feel participants were treated as members of a collaborative team. A goal was set out, and the members negotiated their specific roles. There was direct communication among the participants, using a variety of media, and there was evidence that the organisation was able to detect and correct errors. However, by the 1995 -1996 year, power was being fought over by an increasingly large project team (including the Ministry of Education and DES). New members of the learning triad were expected to work within pre-set guidelines, without access to the organisational memory to help interpret the project's vision and theories-in-action. Participants were also expected to sustain a constructive dialogue using only telecommunications technologies. The resulting problems caused by limited discourse between participants are not only anticipated in the literature (Argyris & Schon, 1978; Cicourel, 1990; Senge, 1990) but well supported.

Over the course of the project, facilitators had a reduced role in the organisational structure of the project. Initially viewed as the most important link in the chain, they eventually were given a list of tasks to perform. Most reported that they had
inadequate time allotted to complete those tasks. There is no evidence that the project team offered ongoing inservice training or professional development (other than the summer symposiums) to assist the facilitators adapt to the new learning environment and change their professional practice. In many ways their role became that of an on-site aid for the mentors. With the introduction of more complicated technology, the facilitators' set of required skills shifted from assisting the mentors to being on-site technicians. Unfortunately, for many facilitators this new position did not come with adequate training or practice time (Facilitator roles are discussed further in Section B).

The NDDL instructional design requires teachers to shift from directing learner instruction to facilitating learning. The skills required to make this shift were to be developed during the first year of the project. However, much of information was lost to the organisation as it was not incorporated into any organisational memory (artefacts or recorded history) and little sharing of the experience happened online. Possibly because of time constraints or the differences between the participant groups, diffusion of the innovative practice (Rogers, 1983) from year one was limited.

The assumption that mentors and facilitators could make the shift on their own was not supported. A number of variables appear to have been in affect

- inability of NDDL to hire mentors and facilitators to match the instructional design;
- inability of NDDL to development curriculum and change assessment strategies to match the potential for innovative practice offered online;
- inability to maintain an organisation for learning to detect error and make adjustments, creating a culture for learning for the educators as well as the students. Because the major scaling up of the project occurred as the project entered its third year, it is not possible to determine if the project could have maintained its innovative practice. The scaling up confounds the data, creating too many variables to study. These variables include

- changing context (including urban centres and adult learning centres rather than focusing on small, rural secondary schools),
- a changing group of participants (those with more main stream views toward NDDL and technology and located in larger centres),
- a changing support system within the project (less contact with the project team).

As suggested in Figure 20, the NDDL instructional model appears to have become too complex to meet most participants' needs. Therefore, it is not surprising that many defaulted to the traditional DES practice (Figure 18).

A founding member of the NDDL project team states "... the educational model (the triad) is being broken down. We have gotten larger and the facilitators are weaker, less committed to the original design. The quality mentors are overworked, and the
students are being directed by the course materials” (Project Team 3, Interview, Summer Symposium, 1996).

The actual bureaucracy (DES, MoEd, and OLA) who eventually came to control the project is not mentioned in the triad model of delivery or assigned any role in the project handbooks. However, each year, these three groups appeared to establish more control, creating a pyramid of power (Figure 28). Without an expressed job description, it appears that the various levels of bureaucracy were allowed to write their own and take over whatever areas fit their scope. Not only did this seem to establish a more entrenched bureaucracy, which the learning triad members were not part of, it began to modify the innovations on which the NDDL project were based and place them within the established traditional education structure.

What had been negotiated in year one appeared to be dictated in year four, and the stakeholders (DES and MoEd), who had run the distance education system for years with dismal completion rates, were back in charge. By summer of 1996, the very rationale for the NDDL project was in jeopardy. A project determined to enhance learning to remote rural schools and improve success rates was now being controlled by DES and offered in schools in major centers or with large student populations. The diffusion of innovation had been stalled by Step Three (Figure 23), and Steps Four through Six saw the project default to traditional practice (Argyris, 1993).

The evolution of the NDDL project suggests that while it is tempting to try to modify the existing educational institutions (eg. DES), it would probably have been better to create something new. Too many of the old metaphors, procedures, and philosophy affected the design and manipulated the goals, and its reliance on DES curriculum dictated its instructional design. While NDDL is a valid and successful attempt at educational reform (by traditional DES and MoEd standards), it is apparent that its initial goal had really been educational revolution. The difference between reform and revolution is huge and the implications far reaching.

Porter’s vision of the future of NDDL is still full of potential (Porter, 1996), but that vision needs to be rephrased into a goal statement for which actionable steps can be attributed. If NDDL is to reform educational practice, then it must first reform its operational practice and return to being an organisation for learning.

In summary, for a series of structural reasons, it took three years for the traditional system to remove the innovation from the NDDL model. The potential for this sort of encroachment is documented and supported in the literature, and while disappointing, is not surprising. It also seems that the structural organisation affected the organisation’s ability to learn and continue as a knowledge-building organisation for learning. This in turn affected the development of community within the project and the ability of the organisation to encourage knowledge-building (Section B). All members
of the NDDL project (project team and learning triad) needed to be encouraged and supported to learn together and engage in innovative practice.
SECTION B - ATTRIBUTES REQUIRED FOR LEARNING COMMUNITIES

Introduction

Based on the information presented in Section A of this chapter, the organisational structure of the NDDL project did affect interaction and communications among participants. It appeared to have affected the program’s ability to develop as an organisation for learning, limiting its ability to encourage knowledge-building among its members and develop a community of learners.

To assess the effect, it seems critical to determine first if learning occurred within the program and then whether or not a community of learners was formed. While it seems implicit that learning would occur in an educational setting and that creating a community of learners would be the natural by-product of academic interaction, it may in fact not have been the case. As suggested in Chapter Two, learning often is not the focus of the educational experience.

To determine if a community of learners was formed, it seems natural to look at the available participants and observed if they participated as a community. In the case study for this research, the community would have been formed in the Law 12 course. Potential participants in that community could have included site facilitators whose students were enrolled in Law 12, the students in Law 12, students who electronically dropped into the course for personal interest, the mentor who taught the course, invited members of the British Columbia legal community (Legal Beagles and Legal Eagles), the researcher, and members of the project team. The degree to which a community was formed will be discussed later.

The question of whether learning took place requires a determination of what might be observable as demonstrations of learning. One example could be the course grades recorded by the mentor. I reviewed these records (provided by OLA Staff 1) in October 1996, three months after the official end of the 1995 - 1996 academic year. The records show that 8 of the 23 learners passed with an average mark of 78%. Four received an IP (in progress), indicating they had not completed enough work to complete the course but were intending to continue. Three of these students received invitations from Law Mentor to join her NDDL Law 12 course again in the 1996 - 1997 academic year without having to pay additional fees. The remaining 11 students received no mark. On the learner reports, it was noted that six students completed the technology challenge portion of the course (see Mentors later in this chapter). These six, however, were not necessarily the same eight who completed the course.

As these numbers only indicate that the learners completed the course work and received credit for Law 12, the issue remains, did learning take place, and if yes, was there evidence of knowledge-building?
Defining learning is complex. Vygotsky (1978) refers to it as "... the acquisition of the ability to think; it is the acquisition of many specialized abilities for thinking about a variety of things" (p. 83). Scardamalia and Bereiter (1994) suggest learning involves transformational thought and discourse in knowledge-building communities; others suggest that learning is completing assignments and attending classes in academic institutions. However, for this research, learning is defined by a collection of attributes which can be found and supported in organisations for learning (Figure 9).

Based on their ability to cope with the factors presented in Figure 9, there is evidence that students functioned within the Law 12 course by either following traditional role expectations (completing the basic DES requirements of the course, Figure 18) or by attempting to engage in higher order thinking and collectively develop a knowledge-building community (participating in the NDDL Instructional Model). It is the assumption of this research that simply completing the correspondence papers does not constitute personal mastery of Law 12 nor does it demonstrate a holistic understanding of the issues raised in the Law curriculum.

Therefore, a logical question is, if the correspondence papers are not enough to demonstrate learning, what activities must a learner participate in within the NDDL Instructional Design to demonstrate knowledge-building?

If the learners simply complete the papers, they may not engage in dialogue with their mentor or participate in collaborative interactions offered online. Vygotsky (1986) states that it is essential for learners to be able to discuss all the elements of a complex learning activity and see all the aspects simultaneously. Then they must be allowed to participate in the determination of increasingly complex activities for accomplishing their goals. These activities must stem from the learner's needs, otherwise there is no reason (need) to engage in them. An example of this occurred when learners in the Law 12 course found that the papers easy enough to complete without assistance so they saw little or no reason (need) to engage in online interactions (Student 3, Interview, July 1996).

Vygotsky (1986, p. 150) states

Practical experience ... shows that direct teaching of concepts is impossible and fruitless. A teacher who tries to do this accomplishes nothing but empty verbalism, a parrotlike repetition of words by the child, simulating a knowledge of the corresponding concepts but actually covering up a vacuum.

The NDDL conceptual framework and instructional design (Chapter Four) are an attempt to move away from direct instruction and focus on mediating the needs of the individual learners. A potential problem is determining who will be the responsible expert peer assigned to assist the learner understand the larger goal and break it into
relevant activities. Without that intervention, learners are left on their own, often defaulting to traditional educational practices which have served them for the past eleven or twelve years of public education.

In many NDDL courses student participation in the instructional model (e-mail, audio and computer conferencing and mediation) is only encouraged not mandatory for course completion (Project Handbooks - Course Guides, 1993 -1996). For example, students in Law 12 were offered a Technology Challenge (NDDL conference participation) as an incentive. If they took the Technology Challenge, they could reduce the number of DES papers to be completed. However, if they simply completed the DES materials, they could receive full credit, missing the online interactions and opportunities for personal knowledge-building (Figure 9).

A question that arises from this research is how did the various members of the learning triad view the instructional design of the NDDL program (mandatory for course completion, complementary to course completion, not necessary for course completion, etc.)? A second part of that question is what affected a member’s participation in the instructional design?

Personal agency seems to be a key variable. Naturally, the agency (history, need, motivation) of each member varied. Of the four facilitators interviewed for this research, three had volunteered to work in NDDL and one had been asked to participate by his administrator (Facilitators 1 - 3, 5, E-mail Communications, Spring 1996). Each had a different background with education and different experience using technology. All four stated that they were motivated to join the project to help their students. They were included in the research because their students had been the most active in the Law 12 course. Only one had been with the project since year one. Mentors were seconded to the program by DES, and the NDDL project team had little or no input into their selection or continued participation in the program, with the exception of the Law mentor. She is recognized by the project team as a leader in Law education and an early adopter and developer new strategies for online delivery. Individual sites selected their own facilitators and DES hired most of the mentors (Project Team 3, E-mail Communications, Fall 1995).

In the case of NDDL, where learners were functioning in a new, virtual learning environment, engaged learners, operating with higher levels of agency, appeared to be empowered to start making sense of the new technology and modifying their work habits to reflect the potential of the new tools available. However, a question arises concerning the degree to which the new tools (computer conferencing, speaker phones, e-mail) affected discussions and limited the social interaction between participants. Steinberg (1994, p. 25) questions the lack of "... eloquent, literate debate" found in most online conferences.
One popular explanation is that frequent flaming results from the absence of social and nonverbal cues - the winks, grimaces, and body language that help guide conversation. Another theory, which rings truer to me, was advanced by science fiction author Bruce Sterling. The problem, Sterling says, is that ... [conference] messages are 'ephemeral:' when a message can be sent in a matter of seconds at virtually no cost to the sender, and has a life span of only a few weeks, there is little incentive to spend much time on its content. Off-the-cuff remarks become the norm.

While the nature of electronic communications will be discussed further in Section D and has been discussed in Chapter Two (Section C), it is relevant to consider its affect on the development of community online and the richness of the social interaction required to support the community. Messages viewed in the course of this research did appear to be off-the-cuff, and few seemed to be drafted after reflection or uploaded after consideration of what had been written. Most seemed spontaneous reactions to messages appearing in the conference. Therefore, the affect that this had on the development of the new, virtual community must be considered.

Mentors and facilitators also functioned with varying degrees of agency and involvement within the new learning environment. Actively engaged facilitators appear highly proactive concerning their learners' needs and site requirements. Facilitators and mentors with lower agency appeared more passive, waiting for learners to participate or individuals to contact them, often waiting until there is a larger problem before acting. This passive inactivity may be reflective of a lack of ownership and/or a sense that issues belong to other people to solve. Empowering individuals is a function of the organisation (Senge, 1990); therefore, it is the organisation's responsibility to detect errors in the implementation of the instructional design (eg. lack of participation) and make the necessary corrections. As indicated in Figure 23, this process of detection and correction appears to have broken down around Step Four, affecting both the learning environment and the development of a community of learners.

Mentors and facilitators did have a professional responsibility to assist their learners, but it appears that for some the instructional design and the communication network limited their action and caused them to default to traditional DES practices. This issue is discussed further in this section and Chapter Four.

An assumption of this research is that those individuals with the lowest levels of personal agency will not participate fully in the NDDL instructional design and will not become members in the community of learners or exhibit evidence of knowledge-building.
Stated Intentions

From the outset, NDDL's conceptual framework and instructional design were based on support for student learning. The program never offered or promised direct instruction. It set out to increase the number of courses offered to small, rural high school students, to increase their access to information, and to connect them to a broader community of learners. It proposed to do this by increased interaction between mentors and students through the development of the learning triad (mentors, facilitators, and learners) supported by leading edge telecommunications and computer conferencing technology (Project Handbooks, 1993 -1996; Porter, 1996).

Over the years, the project offered a variety of media (computer conferencing, audio conferencing, video, CD-ROM, print materials) to enhance learning and delivery methods. It also tried to provide flexibility in course design so participants could customise their learning experiences. Emphasis on the integration of a variety of media to encourage higher order thinking and learning skills was cited. Statements were also made concerning establishing academic rigour, encouraging independent work, and developing independent learning environments to support collaborative learning experiences.

Self-paced learning, student direction, and asynchronous delivery became key phrases used to describe the project.

Actions

To determine if learning took place within the Law 12 conference and if a community of learners was formed, the online interactions of the different participant groups (students, mentors, facilitators, legal professionals, and the project team) were downloaded and analysed. Evidence of learning was collected from the Law 12 conference and interview statements. While the conference messages do not reflect any private e-mail or audio conference communications, they do show interaction around assignments; participant comments about, preparations for, and summary statements surrounding audio conferences; and reflective feelings toward the entire course.

Results of the data collection are presented by participant group (learners - students, mentors, facilitators, legal professionals, and the project team. Within the groups, the data is presented in frames reflecting the NDDL Instructional Model (program structure) and the disciplines required of an organisation for learning (Figure 7). The data was analysed using frames and codes focused on learning, but few learning opportunities for mentors and/or facilitators were evident. This is an important area for future study and is discussed in Chapter Six. As stated before, the importance of organisational learning emerged after the data collection.
Students

NDDL Instructional Model (Students)

If a student functions solely within the DES model of instruction (Figure 18), s/he completes a set of assignments (usually 18 papers) which are often broken into three blocks or units. These papers are mailed to a marker and at the end of each block, the student writes a test. Depending on the site, students might be encouraged by site facilitators to prepare a work schedule (Students 1 - 13, E-mail Communications, Spring 1996).

Grades for assignments or tests are conveyed to the student on an attached cover sheet. Potentially, there is little or no communication around the marks. Often a marking scheme is not included, so students have only the point value and space afforded on either the test or assignment as a guideline for how much work is to be submitted.

Evaluation is based solely on completion of the papers; assessment being a total of points received on the papers and the tests. The self-marking activities, which are usually included in the course materials, are kept by the student and not shared with the mentor other than when the student reports the scores on the cover sheets attached to the tests. Depending on the site, the facilitator may see the self-marking activities or use them as a review with the students.

In the NDDL instructional model, students are expected to expand their learning to include activities requiring demonstrations of personal mastery, collaborative social interaction, and a holistic understanding of the material. This is done via electronic conferencing, e-mail, and participation in audio conferences.

Students who respond to Law Mentor's technology challenge (see Mentors later in this section) receive alternative options for course completion worth 25% of their grade. As the Law 12 course is built around the completion of units of instruction, students are requested to do the first two units (Introduction to Law and Criminal Law) and choose three of the five remaining units; participation in the technology challenge means students could skip one entire unit. Law Mentor reports that during the 1995 - 1996 academic year, 80% of her Law students completed the Technology Challenge. However, official records suggest that 35% of the students received credit for their participation.

E-mail allows students to direct questions, comments, or general conversation to a specific person (Law Mentor or peers). These messages are strictly point to point, meaning that unless the message is forwarded to a larger audience, only the person or people to whom the message is addressed will read it. Electronic conferencing in the Law 12 Forum broadcasts messages to the entire group, allowing students to connect
and communicate with the larger community. Within the larger NDDL conference, participants (students, teachers, project team members, etc.) could also enter into specific course Forum areas. They could either read the messages or read and respond.

Moving around this virtual environment can be challenging as participant identification causes interesting incidents of confusion. In addition to e-mail and conferencing, First Class software allows a communication option called Private Chat. This is a tool in which participants can invite others who are logged on to join them. The conversation is then typed back and forth, allowing for a real time text exchange. As Sandra Hawkins notes, confusion often arose as to the role of individuals and their relationship to the project.

One busy day I was asked to participate in a private chat. I thought the invitation might have been from a new student wanting to introduce himself. I soon learned he had mistaken me for one of the young female students (something that would never happen in my high school!). I didn’t realize his error until he said, ‘I’ll be back after school, O.K.’? When I refused a private chat after a couple of interruptions, he sent an e-mail message saying, ‘Are you just going to leave me hanging here, babe!’ I asked him if his facilitator knew he was spending so much time trying to meet females online. I went on to tell him I was an NDDL mentor and preferred not be called ‘babe.’ He was apologetic - and then came another invitation to chat ten minutes later! I was annoyed and told the individual ... that I didn’t have time for chatting with him. To save him further embarrassment, I quickly added I was a busy NDDL mentor. The fellow was polite and said maybe another time. I later got curious and looked up the resume that went with the name. I had managed to mistake an NDDL Project Advisory Board Member for a student cruising the Internet for young females! (Hawkins, 1996, p. 4).

Aside from the occasional identity crisis, private chat attracts learners to conferencing and allows them to communicate actively. Over time, participants learn to use the resume option as a screening tool. The resume option allows participants to write their own resumes which state their role in the NDDL and something personal about them. The resumes are a textual introduction to participants.

Regular use of e-mail and conference messaging has the potential to encourage active involvement and generate a critical mass of activity in the Forum. For messaging to be effective, participants need constant feedback to their messages. Sending and receiving must go together or the sending stops. The question raised by Steinberg (1994) earlier in this section about the quality of e-mail messages is a concern. Quick remarks or cryptic messages have the potential to be misunderstood and often result in
either no response or offence. When this happens, it has the potential to affect future messaging and possibly limit discussion.

Audio conferencing is another tool in the NDDL instructional model. It is described as a tool used by teacher-mentors "... to establish weekly contact with students in remote locations, to provide tutorial sessions, to communicate with on-site teacher-facilitators, and to plan learning activities with other project participants" (MoEd & OLA, 1995 - Law 12 Guide, p. 51). The ability to speak directly with course participants is valued by many. Law Mentor used audio conferences to distribute the expertise of guest speakers. Panel discussions, presentations, lectures, and forms of group work can be sustained via audio conferences. However, Law Mentor notes that she is attempting to limit the use of audio conferences as they restrict the asynchronous delivery of the course, forcing students to adhere to the conference schedule rather than progress at their own pace. As more students join NDDL who are not enrolled in traditional schools, asynchronous delivery is being encouraged. However, whether computer conferencing is a valid substitute for audio conferencing in terms of developing a sense of community is yet to be determined (Law Mentor, E-mail Communications, Fall 1995).

The NDDL instructional design assumes that mentors will select the appropriate technologies to the specific course needs. The ability to share the successes and limitations of the technologies was a strength of the first year of operation, and as stated before has become limited over the years.

**Personal Mastery (Students)**

Students varied in the degree to which they actively participated in the instructional design which in turn affected their personal mastery. One student, Student 3, states that she used e-mail quite a bit. She wrote directly to Law Mentor, and often Law Mentor encouraged her to share the message with the Forum. Technically this was quite easy. It requires forwarding the private message to the group (Forum).

Student 3 explains, "I wrote very carefully for Law Mentor. I was trying to write what I thought she wanted to read. It was just like a test, you know, I was trying to figure out exactly what was required" (Interview, July 1, 1996). While Student 3 was confident with the technology, she was constantly aware of the organisation structure of the course. She viewed her contact with Law Mentor as being directly related to her grade in the course while she viewed her interactions with the group as an extra activity.

Student 3 participated in the Technology Challenge until she had gained enough credit to stop. She felt that the Law 12 course consisted solely of the DES materials and saw the Technology Challenge as a way to reduce the number of assignments.
Student 3 participated in a few of the audio conferences. "I really enjoyed the social part of those. It was fun that there were more of us taking Law. I go to a really small school and I was the only Law student there. That was fun" (Student 3 - Interview, July 1, 1996).

However, she was rather leery of e-mail in terms of spontaneous sharing of opinions or thoughts.

I couldn't get too involved with those people because the whole e-mail thing didn't seem very honest. I mean people were describing themselves as Claudia Shiver or van Damme ... I mean really. Also I don't think the responses were very sincere as people had time to think about what they wrote before they sent it. The fact that people could read your responses way later, after you had sent them is odd. Those responses would always be there so it made me more cautious. It wasn't spontaneous like talking because that just disappears. So, I didn't write much... (Student 3 - Interview, July 1, 1996).

In the Law Research conference, Student 3 explains

> Wednesday, January 10, 1996 12:00:52 PM
> Law Research Item
> From: Student 3
> Subject: Re: Question #1 for Students
> To: Law Research

... you don't really get any direct feedback from other people so you don't know what people think or feel about what you said. Actually, maybe I better clarify that...what I mean is that after you've said something, you don't ever get a genuine response or reaction from the people who read it because they had time to plan the perfect statement as well. It doesn't feel like a real discussion is taking place.

I don't think that has anything to do with this particular system though, because the only way you can see people's genuine reactions is through person to person conversation. (Which no matter HOW advanced computers may become will always remain MY favorite method of communication!!) Don't take that wrong though, because I do enjoy this as well and I am disappointed to be missing the audio conference on the 17th.

Law Mentor views e-mail in an opposite way to Student 3. Law Mentor feels online

... responses are usually more relaxed and better because we can take time to think about ... [them] and don't have the rest of the room looking at us while we are answering. However, in the audio conference, well, that's a bit more of a risk, but fun" (New Directions in Distance Learning - Conference Archives, 1995 -1996).

The Law 12 course design online did encourage active participation for some students.
I was really interested in the first two cases that Law Mentor put online. Her questions were good and I got really involved. The student responses were too predictable. They either restated someone’s comments or took mine. I stopped the Forum writing and just wrote to Law Mentor. That was more interesting (Student 3 - Interview, July 1, 1996).

Student 3 did not engage in much collaborative interaction online. As there were many the problems with technology (connectivity issues primarily) some students, like Student 3, tended to participate less frequently; however the fact that social interaction and collaboration were not a requirement or part of the assessment also affected participation. To these students, there was no need to participate in something extra.

Student 3 notes that she did not use the Forum to build meaning with the other students as she felt that participation in the Forum was limited and often “... many of the comments simply repeated what the first person had said. If Law Mentor agreed, then everyone just restated what Law Mentor was supporting. I didn’t find the conversation there very stimulating” (Student 3, Interview, July 1, 1996).

During the first months of Law 12, students did participate in the Law 12 Forum. However, it was more social than academic; more the ephemeral messages referred to by Steinberg (1994). It was not until the first week in December (three months into the school year) that a critical mass of activity began. All participants cite that problems with the technology and delays in the delivery of course materials had gotten in the way of their participation.

After the Christmas break, contributions to the Law 12 Forum were calculated. Law Mentor had contributed 63% of the messages. The next most active individual participants were two students with 4-10% of the messages.

Collaboration - Social Interaction (Students)

To generate greater participation in the Law 12 Forum, Law Mentor introduced a modification of the Harvard Case Study model. This was an attempt to move the students away from audio conferences for interaction and to stimulate discussion around actual cases. Law Mentor recognised that many of the students could not fit scheduled audio conferences into their personal time frames, and she was eager to determine a method of more asynchronous course delivery. The case studies were presented as a method to encourage interaction (Law Mentor, Telephone Interview, Fall 1996).

In January discussions around the “Special Delivery” case show students working together to build meaning. The use of legal terminology (the language of legal experts) in the messages increased. For example, one student wrote “I agree with Student 3’s answer here about it being a spontaneous action and the witnesses
contradictions each other, etc.” (Student 4, Online Conference Message, Fall 1995). Student 3 responded and another student added a comment as well. The “Special Delivery” case caused four of the students to go beyond the answers presented by Law Mentor and develop questions of their own.

Possibly because Student 1 was an adult student, a parent, and a grandparent, this case really affected her personally.

Wednesday, January 31, 1996 9:03:19 AM
Law 12 Forum Item
From: Student 1
Subject: Special Delivery
To: Law 12 Forum

... This is where I get angry with social services. I feel that they did not help her at all to get the help she needed. It seems when a young girl gets pregnant and social services step in, all they think of is getting the girl to put the child up for adoption. I wonder if the father had stuck around things of been different. Then on the other hand why did Teena’s band not step in and fight for the child? When all is said and done we have to think of what is best for the child and only the child.

Student 1’s response prompted a quick reply from Law Mentor

Wednesday, January 31, 1996 9:46:47 AM
Law 12 Forum Item
From: Law Mentor
Subject: Re: Special Delivery
To: Law 12 Forum

A thoughtful reply, Student 1—one which shows life experience combined with knowledge, thought, and feeling.

Teena’s band didn’t step in right away because Teena had had little contact with the band. She had been in foster homes for so long even she didn’t think of the band right away. Once she did, she got help. One lady from the band office became a friend and good source of support for Teena. IF you can find the time and the book, I recommend that you read The God Sent Child. However, it might really make you angry!

While other students did not refer to Student 1’s comment directly, they did build on her comments and added facts. This case was the first to prompt comments in the Forum from a variety of students. Initial information was built on, and 11 messages were shared on this topic.

From January 17 until the end of February, the Law Forum was quite active. The cases prompted the students to draw on previous knowledge and to add information received from the current media. While private e-mail communications continued, the students and Law Mentor did communicate openly in the Forum. Students realised how quickly their opinions could change on a topic.

Wednesday, February 7, 1996 12:19:31 PM
Law 12 Forum Item
From: Student 3
Subject: Re: Fwd: Re: Capital Punishment and Extradition
To: Law 12 Forum

Wow, it’s amazing how quickly your opinions can change. As soon as you have a little more information on a subject, like the way [one student] knows more about this case then I did, you start to wonder if what you originally thought, holds water.

Anyhow, in response to Yvonne’s comment about being tried in the country where you committed a crime, I think it was unfair that Michael Fay (or whatever his name is) got caned for something so insignificant.

Student 3’s message continues with details about Fay’s nationality, and she brings her own feelings to the situation and references to the Canadian legal system. In a later message, one of the students submits answers to the survey that Student 3 had designed much earlier. Due the asynchronous nature of the material, the survey results were still relevant, and the student’s summary of the results reflected higher order thinking and understanding.

Student 3 reports that she didn’t use any of the resources provided online to enhance the curriculum. She did not write the Legal Beagles or Eagles or read the reference materials. “There was nothing in the assignments that needed any extra assistance. I didn’t explore any more or do anything that wasn’t requested. The assignments were really simple” (Student 3 - Interview, July 1, 1996). Like many of the other students, Student 3 did become actively involved, but only to the point where the actions were directly evaluated.

An interesting point that came out during an interview was...

something really strange happened to me when I went online. I had no guilt. I knew I would never see Law Mentor so I did what I wanted. Like the survey, I didn’t have time to do it right, so I just made up the results. Then Law Mentor wanted me to present it to the audio conference. What could I do? So, I presented it... I had to continue the charade. I didn’t feel guilty because the assignment was no big deal and not really for grades, plus I would never see those people. I think the whole electronic environment is a bit false. I know other students made up their stuff too, because I got an e-mail about it (Student 3 - Interview, July 1, 1996).

When asked if she had done this before in a face to face class, Student 3 stated she had not; it was just in this one online activity. As a concluding comment, Student 3 states “I would rather have taken this in regular correspondence. The audio conferences weren’t that interesting and the other students didn’t have much to stay. I liked working with Law Mentor, but I wouldn’t say there was any good group work” (Student 3 - Interview, July 1, 1996). She adds “It is tough to do the same old coursework in this computer conference environment. The computer isn’t as good as the
classroom. Maybe they should change the course work if they are going to change the working environment" (Student 3 - Interview, July 1, 1996).

The potential for active learning and extended higher order group work exists in the computer environment; however, the existing assessment and course design did not appear to take advantage of the potential or be consistent with the NDDL stated intentions for the conceptual framework or instructional design.

**Systems Thinking - Holistic Understanding (Students)**

While Student 3 concocted her information about the questionnaire, she did develop the questions and the format the others used. The presentation of the students' findings required them to summarise their data and make conclusions. This summary exercise allows students to work with their own information and make connections to the bigger world of law. Students who did the survey later in the course were able to draw on more legal information than those who did it in the beginning of the course. This is reflected in the terms used and the inclusion of legal procedures in student messages.

Law Mentor's knowledge of law allows her to modify curriculum materials, making timely connections to events taking place in the real world. Students appreciate these connections, noting "...this course is really based in real things, things I face in the normal world. The case studies really made me think about the Law and my life" (Student 1 - Interview, October 21, 1996). Student 1 is an adult student who was able to make strong connections with actual events in her life. She used the resources available in the course (Law Mentor, Legal Beagles, etc.) to find specific answers to personal situations.

Student 3 states she would have enjoyed participating in the Mock Trial and other ...

...hands on stuff, but no one else showed any interest in them. These things would have had to been for grades though. I had a tough course load and needed the marks. I didn't have time for extra stuff - just things for credit (Interview, July 1, 1996).

Student 3 graduated June 1996 as a top honour student. Her course load was heavy, and while she is interested in pursuing Law as a career, she placed her primary goal for the academic year in receiving top marks, "...not learning extra stuff - even though it might have been interesting." Student 3's comments relate directly to the need to restructure the marking scheme and course outline to value and encourage full participation in the NDDL instructional model.

Related to the issue of credit for work completed, one mentor suggests credit for learning to use the necessary NDDL hardware and software.
Thursday, June 13, 1996 10:14:53 AM
Message
From: Mentor 6
Subject: Re: 'Unfinished' students - comments
To: OLA Staff 1
Cc: Mentors

Hi OLA Staff 1, et al,
Just a comment regarding student success/non-success.

... Students apparently unfamiliar with the technology often revert to faxing hard copies of their assignments, or seem to avoid the technology altogether.

I venture to say that site facilitators should be given more release time to train and familiarize students with various strategies in electronic communication and related software. Perhaps an initiation course for students (with a credit or two?) would be advantageous to the NDDL program.

This recognition of the need to understand the technology coupled with students’ needs to accumulate credits parallels Student 3’s comments concerning her motivation for participation. Highly academic students do have huge demands on their time. Mentor 6’s suggestion would validate the time spent and standardise the level of technical agency expected for participation in NDDL.

The introduction of the case study method did encourage student interaction, but in a limited way. There was limited evidence of collaboration among participants to either share what they knew or to negotiate alternative activities or demonstrations of learning.

Mentors

NDDL Instructional Model (Mentors)

Mentors are given the role of adding their expertise to the existing DES curriculum and ensuring student success. The process for this involves direct intervention (clarification of course content, conducting tutorials, offering remedial assistance) and maintaining ongoing communication with the other triad members (Project Handbooks, 1993 - 1996).

Mentors also have the responsibility for student assessment. Ensuring that students do more than simply complete the correspondence papers, without active participation in any of the conferences (audio or computer), is not specifically assigned to any one member of the triad, but it is assumed that the site-based facilitators will have completed learning plans with their students.
It is the mentor’s role (stated in the project handbooks) to contact the students and explain the procedures for getting assistance and submitting assignments. Law Mentor’s opening message is an example of how mentors can accomplish this introduction. Her message sets a welcoming tone, encouraging students to explore Law and get their facilitators involved.

Monday, August 28, 1995 11:50:22 AM
Law 12 Forum Item
From: Law Mentor
Subject: Welcome Legal Beagles!
To: Law 12 Forum

Welcome to all Law 12 students. No matter what your abilities and interests are I think you will find that this is a good course for you. The law is for everybody.

You will find a little about me in my resume here. Ask your facilitator how to find it, if you don’t know how. As the course progresses, we will get to know each other quite well. You don’t need to be face to face to get to know a person.

You can work at your own pace in this course, but you should let me know whether you intend to complete the course at the end of the semester or at the end of the year. This way I can give you a little push if you are falling behind your goal.

We will have 4 major audio conferences this year—some with guests engaged in legal professions. The rest of the time we will chat here and work independently.

After you read this note, you have your first two assignments: please send me an e-mail message introducing yourself and tell me anything that will help me in making this course relevant for you and a note to this Law 12 Forum so your classmates can meet you. (Don’t forget to read the notes that are added here regularly.)

Ready when you are...

Law Mentor

This note is consistent with the NDDL instructional model in that it refers the student to the facilitator for site support, introduces the notion of asynchronous communications via e-mail and group interaction via conferencing and audio conferences, and supports the notion of student learning plans and clear goal statements. She presents the course design (self-paced learning; independent work; and audio conferencing, connecting students with experts in the legal profession.)

The course outline and student learning guide state the requirements and objectives of courses. It is assumed that these items are given to students prior to their enrolling in the course. In the case of Law 12, Law Mentor wrote both these documents. The outline gives a content description of each of the seven units.
However, there is no indication as to the marking scheme or evaluation process. No mention is made concerning participation in any of the NDDL online activities or conference opportunities.

The NDDL Learning Model in the Project Handbook – 1995–1996 states that mentors are responsible for the course content while the Mentor’s Guide states that mentors are only to add their “...expertise to existing course material and ensure success” (p. 4). This is a concern in that the existing course material does not necessarily meet the needs of all the students and is not necessarily well-suited to the delivery options afforded by the new technologies.

Personal Mastery (Mentors)

Law Mentor encourages active participation in the Law 12 Forum and the use of personal e-mail. She ensures that every message sent by a student has a response. “I believe that frequent messages via e-mail can often do more for students than a classroom chat can. The student who wouldn’t ask a question in class may feel a little more confident sending requests via short e-mail notes” (Hawkins, 1996, p. 4-5). E-mail allows Law Mentor to quietly prompt students she has not heard from awhile and make additions or corrections to student work without bringing the entire group’s attention to it.

Law Mentor offers a technology challenge for marks as a method of encouraging active learning in the Law course and ensuring participation in the computer conference, the Law 12 Forum.

Monday, October 2, 1995 8:53:41 PM
Law 12 Forum Item
From: Law Mentor
Subject: Another Assignment
To: Law 12 Forum

...If you take the technology challenge—participate in responding to assignments such has this in the forum, participating in audio conferences, participating in online contests, etc. You will have completed 25% of this course, which means you can skip one full booklet of your choice after the Introduction to Law booklet and the Criminal Law Booklet. Believe me, taking the technology challenge will save you a lot of time, and I think you will find it fun. This is where you interact with your electronic classmates...

While 17 of the 24 students (70%) had contributed to the Forum by the end of February, the majority of the messages were from 6 active students. This figure does not reflect private e-mail that students may have sent directly to Law Mentor or each other.
Some students did not participate in any of the technology challenge opportunities, ignoring the NDDL Law 12 instructional model and functioning as traditional correspondence students (completing papers and sending them to the marker).

Tuesday, June 11, 1996 3:07:02 PM
Message
From: Law Mentor
Subject: Student 1
To: Susan Crichton

... I was right to put my get tough note in the Staff room a few weeks ago. I knew a lot of the students were simply waiting for the last possible moment. Just yesterday and today I have enough work to keep me marking for several days. If I had made the date the end of June, I would have the same thing—only two weeks later. Students who had never sent in an assignment have been emerging saying they're sorry they are a little late! One facilitator messaged me and asked if he could wait until a couple of students had finished the entire course and send all the year's work in a the mail Priority Post in a couple of weeks--some learning situation!

In situations like that, the student missed the online learning opportunity, but it might not affect her/his grade as student evaluation was based solely on completion of the papers and performance on the tests. Online participation and group work was not a consideration in assessment.

The Student Guide for Law 12 outlines audio conferences, explaining teleconferencing (what to expect and how to participate) and the learning that should take place. It gives an introduction to the four audio conferences (topics and responsibilities), supplementary articles to read, and offers a guide to mediating teleconferences which is aimed at both mentors and students.

You may be part of a role-playing project, or presenting your research, or taking part in a debate. You may be listening to an expert, or working in groups to prepare discussion material. No matter what the format, you will find that teleconferences are exciting events (Ministry of Education & Open Learning Agency, 1995, p. 1).

Law Mentor's intent is for students to have opportunities to reconstruct their knowledge, using the technology available. If students and/or facilitators make decisions to simply complete the 18 papers, there is little Law Mentor could do. However, those students who become more actively engaged have access to higher order activities and experts in the legal profession.

During an early January NDDL mentors' audio conference, there was general consensus that the level of commitment from the facilitators had major impact on the students. Mentors were concerned that facilitators varied considerably in terms of their commitment to the program and their involvement with the students. They discovered
This will make our forum more lively and the course will be relevant to you because you will see how the law REALLY works or maybe even that it doesn’t.

I won’t promise quick fixes—just a lot of interesting discussion.

In the past we found a lot of folks who weren’t Law 12 students dropping in with their questions—and that’s O.K. We get to see more law in action. You can even pose questions about what you saw on t.v. or read in the paper dealing with law that you didn’t understand or that makes you want to have a place to complain.

Simply type ‘Legal Beagle’ (and you’ll be surprised how tough that is to type correctly when you are moving at any pace) as your subject to alert us that we have a question or comment not necessarily related to what you are reading in your text.

Let’s hear from you!!!! It’s part of the technology challenge if you need a bribe to get you started.

Seven days later Law Mentor received the first question directed to the Legal Beagle. It was an actual situation concerning a friend’s problems with family court. Law Mentor responded and stated she would find a legal professional to answer the question. On December 11th, the Legal Eagle (reference to all the eagles around the Queen Charlotte Islands where the provincial court judge was from) answered the question and explained the legal process involved in the case. Law Mentor and the student discussed the response in one set of exchanges, but no other participants offered their thoughts on the problem.

The question concerning how students felt about unfair laws developed into an audio conference. Student 3 had sent her responses to Law Mentor, who in turn requested that they be shared in the Forum. Student 3 did, and the format she developed became the format for the class. Law Mentor built an audio conference around that survey, but there was no Forum discussion about it. As mentioned in the Students’ Section in this chapter, unfortunately all this activity was around the survey for which Student 3 had made-up the responses. That audio conference concluded the Law activities until after Christmas Vacation. Plans for a January 17th audio conference were made.

Based on a number of factors (number of students, lack of active participation in the Forum, and self-pacing), Law Mentor modified the course design.

Monday, January 8, 1996 11:00:26 PM
Law 12 Forum Item
From: Law Mentor
Subject: First Case for Audio
To: Law 12 Forum
Because we have so many students in Law 12—all at different spots in the course, I have decided to try something a little different for our audio conferences. We will still be discussing cases, but rather than concentrate
A week later a further note concerning technical issues arrived.

Monday, October 9, 1995 8:19:01 PM  
Law 12 Forum Item  
From: Law Mentor  
Subject: Audio #1  
To: Law 12 Forum  
Hello Legal Beagles!  

I am waiting to get a neat piece of machinery called a Paper Port, before I start any case discussion here. I have lots of cases that we'll be discussing typed out, but not on hard drive or disk, just now.

The message went on to organise the first audio conference, which unfortunately did not take place until October 31. By October 13, two students had started their coursework and Forum contributions. However, there was confusion concerning using the NDDL model instead of the DES design.

Friday, October 13, 1995 9:44:34 AM  
Law 12 Forum Item  
From: Student 4  
Subject: Law Mentor: Assignments  
To: Law 12 Forum  
I am a little confused as to where I type my answers. I can't type them on the assignment after I save them somewhere else. Do I make my own file? Can I answer more than 1 activity on a page. I just need a little guidance here. Also, on activity 3, unit 1, section 1 (the question about what to do if you think a law is unfair) Am I supposed to use some type of reference or just wing it with what I THINK someone should do? I really have no idea if that is the case. Thanks...

Law Mentor responded to Student 4's question on October 16th, presenting the protocol for labelling assignments sent electronically. Student 4's note suggests that her site facilitator did not understand how assignments were to be sent, which is interesting as facilitators and mentors had received training during the summer symposium. However, Student 4's message also reflects her self-direction and empowerment to take charge and ask the right questions. Throughout the academic year, Student 4 was the most active student in the Forum.

Wednesday, October 18, 1995 11:17:13 AM  
Law 12 Forum Item  
From: Student 4  
Subject: Law Mentor: Assignments again  
To: Law 12 Forum  
I have already began my assignments but I am still not sure what to do on the question about what a person should do if they think a law is unfair. Please help. Refer to my message (Law Mentor: Assignments) for more info if you want.
By 4:00 that afternoon Law Mentor responded to Student 4’s question with a
detailed answer, outlining the entire procedure for uploading comments to the Forum
and assignments directly to Law Mentor for marking. Law Mentor also presented the
Technology Challenge and opened a question in an attempt to get a class discussion
going in the Forum.

Wednesday, October 18, 1995 4:28:00 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re: Law Mentor: Assignments again
To: Law 12 Forum
Ask yourself, what would YOU do if you thought a law were unfair?
What would you do if you thought a law was so against what you believed
in you couldn’t follow it?

Let’s a get the class discussing this here. Give some examples of what
people have done when they haven’t believed in laws. Ask people in your
community what they have done or would do.

Now--if you are wondering what good it is to discuss this here--read my
next message on getting through this course--in style!

Student 3 took Law Mentor’s lead and responded to the question on October
19th. Law Mentor supported Student 3’s comment, but no other students entered into
the discussion until four days later when they presented their own ideas. However,
they responded to Law Mentor’s question not to the writing from the other students.
Law Mentor stated she was “... keeping track of who responds ... and how often. So
carry on discussing here--and, of course, send your unit assignments to me via an
attached message on e-mail” (New Directions in Distance Learning - Law Conference

Collaboration - Social Interaction (Mentors)

Law Mentor did not offer any guidelines for online discussions, so students put
their comments into the Forum, writing in a hierarchical way to Law Mentor and rarely
responding laterally to include each other. It was hard to find much evidence of
students building on each other’s ideas or relating their ideas to the text or other
resources offered in the course. Law Mentor did offer support and positive comments
to encourage the students to continue their contributions.

Sunday, October 29, 1995 8:15:12 PM
Law 12 Forum Item
From: Law Mentor
Subject: Discussion--Student 4
To: Law 12 Forum  
Thanks for your reply, Student 5. I can see you have done a lot of work on this response. Not only did you state your opinion, you gave some lengthy examples.

You asked for feedback as to how you can respond better, here--you are doing fine. Just type in your answers as if you were speaking to the class. This is a lot better because you have time to make a thoughtful response. Sometimes in class students go away thinking about what they should have said. Here you have time to think about what you really want to say before you answer.

This message then went on to elaborate on the legal situation and attempt to extend the thinking about the issues with more examples. In a follow up message, Law Mentor had to correct herself as she praised Student 5 for the work that Student 4 had contributed. Every student contribution to the Forum received a positive response from Law Mentor which focused on a specific thing the student had written.

The bulk of the messages in the Forum still were basically social, saying hello and asking where the students were, etc. Some also referred to technical problems associated with connectivity and uploading files; both of these issues had been presented to both facilitators and mentors during the summer symposium. In early November, Law Mentor sent a third detailed message explaining how to send assignments to her. Some sites were still not following the protocols, and Law Mentor was still receiving faxes instead of electronically transferred assignments (Section D) or having assignments sent to wrong DES which was 300 miles north of her.

By the end of November, Forum activity was nil.

Monday, November 29, 1995 10:00:23 PM
Law 12 Forum Item
From: Law Mentor
Subject: Calling All Beagles!
To: Law 12 Forum
I haven’t seen much action here for a while, but I am getting a lot of e-mail from law students as more and more of you get signed on to this system.

I am also beginning to get some legal inquiries that are very real to the students asking the questions. This reminded me of the good project we had going a few years ago affectionately called, ‘Ask the Beagle.’ Now you see why I keep referring to you as beagles!

At any rate, I asked one of the student if she were willing to put her question onto the Beagle Forum. I gave her directions as to how to get there--and when I traced the trail I sent her on, the Legal Beagle wasn’t there.

So, I am proposing we bring him back right in the Law 12 Forum. You ask your questions here--and, if I can find someone who is a professional in the area that you have asked your legal question, I will try to get an answer for you.
This will make our forum more lively and the course will be relevant to you because you will see how the law REALLY works or maybe even that it doesn’t.

I won’t promise quick fixes--just a lot of interesting discussion.

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To: Law 12 Forum
Because we have so many students in Law 12--all at different spots in the course, I have decided to try something a little different for our audio conferences. We will still be discussing cases, but rather than concentrate
on the Charter at this point I will give you three cases to discuss at our next audio. It won't matter where you are in the Law 12 course--just read the case and decide what you think should happen.

The cases are real--I have changed some names and a few details in places, but nothing major.

Here's your first one to think about and be ready to discuss Jan. 17: CLASS ACT.
[the actual case in story form follows]

In a second message Law Mentor explains the method to follow and the rationale behind case study.

Monday, January 8, 1996 11:15:26 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re: First Case for Audio
To: Law 12 Forum

If you want to ask any questions about 'A Class Act' this is a good time to discuss them. I won't tell you what actually happened in the case until we have our audio conference. I have taken several real cases and made them into stories--this is sort of like 'The Harvard Case Study Method' which gets you involved in a story with some questions that are not easily answered. It doesn't really matter what answer you come up with. The important part is the thinking you do to get there.

Stay tuned for more...

In a third message Law Mentor presented some questions to consider before the audio conference. She told the group "... I am not looking for a specific answer--just evidence of good thinking" (New Directions in Distance Learning - Law Conference Archives - 1995 -1996).

Two other cases were added to the Forum, and students sent in messages confirming their participation in the audio conference. Law Mentor added questions for each case as preparation for the audio conference. However, there was no discussion in the Forum concerning either the questions or the case. The audio conference was well received, and there was student interaction around the topic of wanting more audio conferences. This was one of the first lateral exchanges in which students referred to each other's comments as well as directing their messages to Law Mentor [see Section A - Project Scheduling].

On January 23rd, Law Mentor uploaded the next case.

Tuesday, January 23, 1996 9:52:10 PM
Law 12 Forum Item
From: Law Mentor
Subject: A New Case
To: Law 12 Forum
Here's the next case for us to discuss. It fits well with Unit 1, Section 4, Act. 2. Many of you will remember this case because it got a lot of media attention a couple of years ago. It was a very difficult case. I will leave you it the case for a day or two then add some questions which I hope you will discuss here—with as much enthusiasm as you did on our last audio conference. Let's liven this forum up a bit!!!
[actual case follows]

Law Mentor invited everyone to get involved in the case and explained

Wednesday, January 24, 1996 2:10:39 PM
Law 12 Forum Item
From: Law Mentor
Subject: A Few Questions
To: Law 12 Forum
This is an experiment, I am hoping we can have a good discussion of the Sewan/Tearoe case here in the Law 12 Forum. I will begin by asking you three questions, which I hope you will all try to answer by Jan. 31

Everyone is invited to get involved—even if you aren't a law student, but, law students, you know that this gives you course credit!!!

This case got the discussion going. While the comments were mainly directed to Law Mentor, seven messages were entered during a two day period. In one message, Student 4 directed her comment back to Student 3's earlier comment, and three of the students included legal terminology in their opinion statements.

By mid February it was clear that the Harvard Case Study model was increasing the level of participation in the Forum. There were many opportunities for students to use higher order thinking skills, connecting previous learning to the new classes, defending opinions and positions, etc. Still, there was not much collaboration taking place, and the majority of the comments were directed to Law Mentor or were responses to comments she had made.

It is interesting that the new technology and its potential for interaction is being defined by the traditional culture of teacher direction. Students were still contributing messages in a hierarchy of student to Law Mentor rather than much lateral movement between themselves and including Law Mentor. During an online interview, Law Mentor talked about the difference in the amount of private e-mail she receives verses Forum contributions.

Monday, February 19, 1996 7:43:11 AM
Message
From: Law Mentor
Subject: Re: A questions...
To: Susan Crichton
...I get LOTS of private e-mail. The comments are friendly, relaxed, joking, and sometimes include personal info such as 'I'm pregnant and happy about it!', 'I know I haven't been putting in enough time lately', or
‘My friend has a legal problem, I wonder if you could help...' None of the quotes are direct-an approximation.

In many ways the Law 12 Forum now seems much like what happens in a class. The main difference is I don't see the eye of those who date to look at me so I call on them without their volunteering. In a forum I wouldn't say, 'Joe, I haven't heard from you for a long while...' However, I do e-mail students and encourage their participation--it usually works.

By March it was clear that there was a disparity between sites. Sites that tended to participate regularly in NDDL had substantial facilitator support and dependable telecommunication connectivity. The people and the equipment worked, encouraging and sustaining participation instead of impeding it. However, within the NDDL project there was great disparity between sites concerning facilitator involvement and technical expertise (Mentors 1, 5, 8; Facilitators 1 - 6, E-mail Communications, Spring 1996).

Tuesday, March 5, 1996 9:08:54 AM
Law 12 Forum Item
From: Law Mentor
Subject: Case Studies
To: Law 12 Forum
Just a note to let you know I have slowed down with the case studies for a bit for a couple of reasons:

Several students who have either been ill or have had trouble connecting to the forum have messaged me indicating they wish to be part of the technical challenge. I want to give them a chance to get their opinions online before I comment any further on the cases or set up an audio to discuss the latest cases.

We have two major audio conference coming up--March 14(Thursday @ 10:00 AM) and April 16 (Tuesday @ 10:00 AM). We will have a few projects based on these audios, so you will have enough to do here for a while.

This decision affected the Forum participation. The number of messages decreased. The audio conference Law Mentor referred to focused on professions in Law and was a joint preparation between Law Mentor and OLA Staff 3. Students were encouraged to read biographies of the various legal professionals and download pictures of the participants (see Legal Professionals later in this section).

The Law 12 course design, with its focus on the 18 papers, tends to make participation in the Forum voluntary or at least un-graded. Therefore, students appear to approach their participation there in a rather casual manner, chatting informally to one another and often responding to Law Mentor's prompts with short comments. However, Law Mentor's knowledge of the law and her willingness to help students did not go unnoticed. Student 3 states
... Law Mentor was great. She has loads of time to do this course. She always has time for her students and she is really knowledgeable and interested in Law. I think she is perfect for the job because she cares about the students and knows lots about the subject” (Student 3 - Interview, July 1, 1996).

This is an interesting comment in that Law Mentor has the highest number of students and largest course load of the mentors. However, she manages to convey the notion that she has plenty of time to give for each student’s needs.

**Systems Thinking - Holistic Understanding (Mentors)**

The ability to use audio conferencing as a tactic to encourage group work was somewhat limited by the scaling up of the NDDL project. As more students at an increased numbers of sites enter the program, coordinating timetables becomes more difficult. While audio conferencing was presented in the learning guide as the vehicle for group interaction, Law Mentor is making adjustments and attempting to use the Law 12 Forum as an asynchronous alternative. However, some students prefer the audio conference format (Chapter Five - Section A, p. 118-120) as it offers an alternative to text based interaction.

Because the participation in conferencing was so limited, there are few examples of holistic understanding among students. It is an assumption of this research that the online environment affected this development. As stated in Chapter 2 (Section C), the degree to which media richness, social presence, and social context cues affect social interaction and the ability of individuals to engage in knowledge-building online is not fully understood. Participation in the case studies appeared to be tentative. As Student 3 suggests, students seemed reluctant to share their opinions with each other and tended to direct their writing to Law Mentor. Whether it was a fear that their ideas would be taken by others or having their ideas appearing in print, the medium did appear to affect the degree of cognitive collaboration. The development of trust, often associated with functioning in a safe community, may not have happened. Therefore, students might have been fearful of the comments of others and not chosen to share their levels of understanding about a topic.

**Facilitators**

**NDDL Instructional Model (Facilitators)**

Facilitators were the teachers who were actually on-site with the learners and had the expressed job of
... fulfilling a unique role in the delivery of courses. You will be the on-site contact, counselor, motivator, and technical expert. ... You will also have the opportunity to explore new technologies, and make more effective use of existing modes of communication. We hope that you will find that working with teacher-mentors, students, new technologies, and the project team a worthwhile and interesting experience. It should add a whole new dimension to your teaching and learning experience (New Directions in Distance Learning - Project Handbook 1995-1996 - Learning Guides, p. 29).

Facilitators were members of the learning triad and had distinct roles and responsibilities in the instructional design.

As a teacher-facilitator, you are responsible for maintaining the distance learning environment at your site, assisting students with learning plans and schedules, working with communications equipment and software, training students in the use of telecommunications tools, and monitoring student progress. You are also responsible for maintaining communications links with the teacher-mentor, and with your students (p. 30).

The degree to which the facilitators assumed their responsibilities appears to depends on many factors, among them, their sense of personal agency in the project and their understanding of the program's structure. There was no evidence of any student involved in the NDDL instructional model who did not have her/his facilitator at least initially assist them with the technology (Students 1 - 13, E-mail Communications, Spring 1996). A major concern evident in the instructional design is the lack of formal procedure for interaction between the mentors and facilitators concerning the development and continuous revision of student learning plans. Law Mentor explains

I have had a number of facilitators—even some of the slackest, message me with information about 'special' students—especially FAS, tumors ..., learning disabilities—sometimes even bad home situations—a couple of my students 'run away' last year— one with his mother as their dad was violent—tough stories. However, I don’t know how many facilitators don’t share important info. Last year I learned in the Georgia Strait Vancouver newspaper that one of my Law 12 students was 12 years old. He was written up as a real success story. I didn’t know his name. He messaged me once saying, 'What am I supposed to do here?'—or something close to that. I give home a bit of an intro and asked him to get his facilitator to help him get started. He never got back to me. Today I had a similar message from a girl at the same site. I gave her a similar answer. A week later she wrote me back saying, 'I still don’t know what
to do. How do I send you a file?" I relented and tried to explain the entire
procedure in an e-mail with another note about seeing her site facilitator(s)-
-mentions that they were very approachable and I was sure one of them
would help (Law Mentor, E-mail Communication, October 1996).

Mentors must rely on facilitators to inform them of any special needs for
specific students. The strength of the triad rests on all the participants interacting.
Learning plans are a potential interface between the members of the triad model.
The responsibility of formalising learning plans and sharing them with course mentors
is an area of slippage within the NDDL instructional design. Mentors were given the
responsibility "... for course content, marking, tracking student progress, and tutoring" (New Directions in Distance Learning - Project Handbook 1995 -1996 - Learning
Guides, p. 30); however, this is made difficult when the mentor is unaware of student
goals.

When facilitators were asked to identify their most important responsibility,
most stated knowledge of the technology (Facilitators 1 - 6, E-mail Communications,
Spring 1996). It is an assumption of this research that problems with technology might
have limited the learning opportunities for some for the participants. This will be
discussed further in Section D. One facilitator states

If we hadn't solved the broken cable problem this week I think we might
have lost some students to frustration. [One student] was especially upset.
The facilitators need to have a high level of understanding of how the tech
works in order to appear confident and helpful to the student who look to
them for help (Facilitator 3, E-mail Communications, Fall 1995).

Facilitators also commented that time was the common concern. The message
below is from one of the more successful facilitators in terms of student completion
rates. She is quite proactive on behalf of her students, advocating for their special
needs and sharing the information with the mentors.

Friday, February 23, 1996 10:19:26 AM
Message
From: Facilitator 1
Subject: Re: MORE questions...please...
To: Susan Crichton

First of all, Susan, I should apologize for not responding to your
questions earlier this week, which brings me--to the second part of your
first question regarding the challenges and frustrations of being a
facilitator. For me, the main challenge is finding enough time to do the job
well. Here is a list of some of the things I do:
- monitor student progress
- tutoring on occasion
- assist student with NDDL technology
- direct students to other resources which may aid them in their studies
- post a weekly audio conference schedule
- remind students of audio conference times
- academic counseling
- contact mentor re. individual students or to arrange suitable audio
  conference times
- provide moral support to students
- check course folders and staff room notices on a regular basis

Since I am also the coordinator at our continuing education center, it would
be difficult to describe 'an average day as a facilitator.' In general, I
attend to things in order of priority; often times, due to time constraints,
my NDDL duties are left until last unless a student requests assistance.

Although this has been stated before, there is a huge discrepancy between
facilitators at the various sites. There also is a discrepancy in terms of their teaching
assignments and site responsibilities. Not only are individuals apt to approach doing
their jobs differently due to their agency and personal mastery of the skills required, but
each site appeared to have defined facilitators' responsibilities differently (Facilitators 1-7,
Interviews, Spring 1996).

I believe that facilitators had the most radically changed role in the learning triad.
As the responsibility for the subject matter had shifted from the facilitator to the mentor,
facilitators were expected to support student learning and develop the necessary skills to
accomplish that task. There is no evidence that the facilitators saw themselves as
students in this process although none had previously participated in this type of
learning environment. There also is no evidence of online support or professional
development for facilitators. The only instruction for their changed role came from the
summer symposium and NDDL guide books which formed part of the NDDL yearly
handbooks.

Upon analysis of the online interactions, the silence (lack of messages) around
the issues of facilitation strategies and sharing of successful facilitation activities is
eloquent. While interactions may have taken place between mentors and facilitators,
sharing techniques and strategies, they are not evident in the public conferences and
therefore do not form part of the NDDL organisation's artefacts. This is an area for
further research and appears to be an area of slippage within the NDDL instructional
design.

Personal Mastery (Facilitators)

Student 3's ability to participate in the NDDL learning model was directly
affected by her facilitator's lack of involvement in the program. The facilitator
expressed no ownership for the program and did not work with Student 3 to establish a
learning plan or a statement of goals. Student 3's participation was totally self-directed.
In order to get into the room where the NDDL equipment was set up, Student 3 had to
track down her facilitator and get the keys. She reports that this often took up to 20 minutes of a 60 minute class block.

While her facilitator offered his help and suggested that she find him anytime, he was not pro-active in his involvement. Eventually, finding him and having to deal with the technical problems became too much, and Student 3 stopped her participation in the NDDL model and simply completed the correspondence papers.

Because of this situation, Student 3 felt she had little input into the program, her time frame, and the NDDL procedures. Her facilitator's lack of agency directly affected her own sense of agency. Consequently, Student 3 states she would have rather taken Law 12 via DES and not been frustrated with the NDDL delivery as it was not a workable option (Facilitator 6 & Student 3, Interviews, Spring 1996).

Law Mentor reports that a few other facilitators functioned as Student 3's had. Consequently, their students could not participated in the NDDL opportunities either. Mentors note that the skills of the facilitators seemed directly linked to the opportunities afforded the students at the specific sites. They also report that facilitators with high levels of agency (comfort participating in facilitator audio conferences, understanding of the technology, and previous experience with distance education and / or self-paced instruction) tend to encourage their students to participate fully in the NDDL model. As stated earlier, the ability of the facilitators to learn and develop the skills necessary to function within the learning triad was left up to the facilitator to obtain for themselves. It is an area of slippage within the instructional design of the NDDL project as there is no evidence of project team intervention, assisting facilitators to cope with their new roles.

Facilitator 3 notes the type of student who is initially successful in the NDDL instructional design often is not the student traditionally successful in schools. At that facilitator's site, the two most successful students from the traditional program became immediately frustrated with the delay in materials and the ambiguousness between the correspondence materials and the instructor's course outline. These students tended to trust the printed materials more than the mentor's words, and they were constantly vigilant for any deviations from the set curriculum. The other students, who were enrolled in the same course and previously unsuccessful in direct instruction, tended to go with the flow, waiting for the mentor to offer alternatives and valuing any deviation from the set routine (Facilitator 3, E-mail Communications, Spring 1996).

When Facilitator 3 explored this situation with the two groups of students, the traditionally successful students stated they were afraid that they would not clearly understand the evaluation of the new material, consequently their grades might suffer. The other group valued the grades less, seemed more used to being confused about the structure of courses, and were much more willing to spend time on things that might not generate marks.
This situation appears related to a student's conceptual understanding of the program. Students who have always understood the structure and have thrived in it appeared very reluctant to deviate from the norm (Students 1 - 13, E-mail Communications, Spring 1996). They express appreciation for instructor control and like being told exactly when things are to be completed and how they are to be evaluated. These students state that they were less willing to participate in group Forums related to sharing their understanding of the material, but they were quite willing to participate in the social online Cafe and Private Chat options.

The online environment appears fine for social communications, but initially places stress on the students' conceptual understanding of curriculum delivery. Student 3's comments concerning online participation support this. Student 1, the returning adult student, was representative of the second group. She had not been successful in the traditional environment, having dropped out of grade 11 twenty years previously. Any alternative Law Mentor presented was valued and explored by Student 1, who expressed her interest in learning Law not just getting a grade (Law Mentor, Student 1 & 3, E-mail Communications, Spring 1996).

Students varied in their understanding of the conceptual design of the NDDL program, especially the relationship between triad members. One student notes "In my mind Law Mentor is my site facilitator because if I have any questions, I can contact her through e-mail and she usually responds within the hour" (Student 4, E-mail Communications, Spring 1996). Another adds "... I feel my mentors are in charge. I don't get too much assistance from my facilitator with courses I'm doing online..." (Student 7, E-mail Communications, Spring 1996).

Collaboration - Social Interaction (Facilitators)

Facilitators varied in their ability to support and encourage student participation online. As stated earlier, the establishment of a community of students in the Law 12 course did not happen as expected. There was limited online interaction, and few students successfully completed the course.

At the 1996 summer symposium, some facilitators suggested that students should be pre-screened to predict their potential success in the NDDL instructional design; however, when they were asked to identify traits that led to student success, there was no clear answer. This may be linked to the facilitators' lack of understanding of their specific roles in the learning triad and the lack of training offered to the facilitators. It certainly is an area in which further research is required.

During that discussion, facilitators varied in their experiences with the program (positive and negative views of the learning triad) and were unable to describe the
perfect NDDL student profile. During the course of the 1995-1996 academic year, Facilitator 3 suggested:

It seems to me that the high end students have difficulty adjusting to the NDDL scenario. Perhaps they are less likely in the regular classroom to interact with the instructor for assistance and this just transfers into the NDDL arena. In order for them to be happier in this environment, the instructors need to be more reliable in their communications with the students. Putting the onus on the students to initiate interactions is less likely to lead to success.

Another of my personal observations is that the courses which are more structured assignment and conference-wise seem to work better. The structure can still allow for independent, self-paced learning, however, the students like to know exactly what the expectations are and how to work through the assignments. I don’t think this conflicts with the NDDL philosophy and is an area which may need some improvement (Facilitator 3, E-mail Communications, Fall 1995).

Facilitator 2 notes:

Tuesday, February 20, 1996 8:40:31 AM
Message
From: Facilitator 2
Subject: NDDL question #1
To: Susan Crichton
I talked to two of the kids about this very subject [type of students who are successful in NDDL] - one loves it, the other hates it. The one who thinks it is the best way to learn, loves being able to progress at her own speed... The student who hates it needs the constant interaction with a teacher - she needs to ask 'Is the right' 24 times a class and without that reinforcement she feels lost. [in one NDDL course - not Law] ... students find frustration with the lack of information. The text says 'Do this' but there isn't sufficient info to allow them to do the work unless they knew how before they started the course. If the teacher isn't online, they sit and get frustrated for the entire class. [The teacher is] aware of this problem and plans to rewrite the course for next year.

Self-motivation and the ability to find resources and work independently were traits universally identified by both students and teachers. Passive students who expected total teacher direction needed extra assistance from either mentors or facilitators to make the transition from traditional education to NDDL.

Consequently, it appear that the ability of students to build and expand their understanding in Law 12 was directly related to their facilitators' commitment to the instructional model and the student's own sense of agency in the program.
Systems Thinking - Holistic Understanding (Facilitators)

Law Mentor had organised a mock trial as the major finale of Law 12. Initially planned as an audio conference, Law Mentor modified the plan and offered it as an online opportunity. Students gradually volunteered for roles, but course time was running out.

Tuesday, April 23, 1996 10:13:59 PM
Law 12 Forum Item
From: Law Mentor
Subject: THE GRAND FINALE!!!
To: Law 12 Forum
NDDLC Audio conferences
This is it! The last audioconference of the year will happen Monday, May 29th at 2:20 PM until 3:05. The topic is R.v.Brock, the trial I introduced online a couple of weeks ago. My students at Columnneetza are presenting it for the community April 24. The students will be on hand during the audio to introduce the case, play the roles of lawyers and witnesses and let you decide what should happen. You were going to play the Crown and Defense roles, but it is taking too long. The first witness has been on the stand for more than a week!!!! We will get it done in less than an hour the 29th.

This attempt to do a mock trial via both audio conference and real time had some challenges.

Thursday, May 2, 1996 12:13:09 PM
Law 12 Forum Item
From: Law Mentor
Subject: Audio Mock Trial
To: Law 12 Forum
Would anybody who participated in the online mock trial please tell your classmates a bit about it?
I’d also be interested in hearing your opinions. We pulled it together quite quickly for the audio and had to do a lot of improvising. A couple of times I swore myself in, gave evidence, examined and cross-examined myself! No wonder I got a little confused!!

My Columnneetza mock trial participants told me I gave you the wrong info at the end. the real accused was convicted of manslaughter and served time in an adult correctional facility--not second degree murder as I first told you.

At the end of the academic year, another innovation was introduced into the Law 12 course. Guest 1, a graduate student at Simon Fraser University, developed a MOO environment (described in Section C) in which to conduct a virtual mock trial. However, the timing was wrong as many of the students had finished their work or were too busy to take on something new. The MOO is a pilot for the 1996 -1997 year.

Law Mentor closed the year with the following
Monday, June 10, 1996 11:20:08 AM
Law 12 Forum Item
From: Law Mentor
Subject: Almost it...
To: Law 12 Forum
Most of you have nearly completed the course or have already done so.
Congrats to all. I've enjoyed working with you and hope we meet again--
here or in person.

As you probably recall, I am wrapping up the marking this week--Friday
so I can get on with doing your final reports and moving on to Vancouver
for a few days to work on the Law 12 course revision for the Ministry of
Education--but mostly for students!

If you care to leave any closing messages in the forum--or better yet, I the
MOO--come on get brave and message Guest 1 if you need help--please
feel free.

I'll be checking e-mail regularly until June 21. Then I'll have trouble
getting a connection.

Watch for reports in approximately a week. I will send both you and your
facilitator a copy via e-mail
Regards - Law Mentor

There were no further Forum contributions after that other than one student
commenting that her MOO experience had not been successful.

The mock trial (whether via audio conference, computer conference, or MOO
environment) would have been a rich activity in which students could have applied their
legal skills and transformed their personal knowledge building. However, the fact that
it did not directly contribute to a grade and came as a bad time in the academic year
limited its effectiveness. The MOO environment did host a mock trial during the 1996 -
1997 academic year, but the data from that activity is not included in this research.

Legal Professionals (Legal Eagle and Legal Beagle)

NDDL Instructional Design (Legal Professionals)

The legal professionals have an important role in the Law 12 program and are a
key to making this course's delivery unique. Their involvement in the program
connects not only the community of students in Law 12 together, but it connects the
students with the community of practice - the legal professionals.

In the late 1980's Law Mentor and her husband (a Legal Aid Lawyer) were
exploring the Xchange system, a computer conferencing system offered to members of
the Simon Fraser University Department of Education and teachers within the province
of British Columbia. Law Mentor's husband
... got the idea of setting up an 'Ask the Beagle' conference. David Porter [who was running Xchange at the time] ... was a little hesitant about letting someone who wasn't a teacher have an i.d., but he took the risk. The conference got very popular and I met a lot of teachers and students online. I started a subconference called 'Swappe Shoppe' a place for law teachers to exchange ideas. SFU then ran out of funding to carry on letting us on without charging $$$$. David and Enid then got us involved with the Southern Interior Project--that's when I started doing audio conferences for law. David did the audioconference moderating those days. The first time he told me I should try the next one on my own I was scared stiff. I felt like a talk show hostess or something. At that time, the audio conferences were for teachers who signed up to do extra projects with their students.

One day, late in the second semester, I thought I had a brilliant idea. I messaged David and said, 'I think we are ready to offer the Law 12 course via computer and audio conference.' I thought I was really forward thinking with that idea. David's reply was, 'I know--how about starting this fall?' When I thought about the curriculum I had been developing and the audio conferences I had been participating in, I realized that David had been a few years ahead of me all the while. He obviously had a plan and I was merrily just moving right along with it now knowing where it would be going (Law Mentor, E-mail Communications, Fall 1995).

Throughout the years of Xchange, Law Mentor brought online many lawyers and legal professionals who volunteered their time to participate. In the first years of NDDL, Law Mentor again connected legal professionals with the students via the audio conferences. One of the memorable conferences focused on civil disobedience and the anti-logging protests that took place at Clayoquot Sound on Vancouver Island, British Columbia. That conference brought together protesters, loggers, members of the logging company, members of environmental groups, and the legal representatives of each. This experience was extremely rich in that participants could join the audio conference from their homes or work, and the students connected from their sites. No one was too remote or isolated to miss the opportunity.

In the 1995 - 1996 academic year, these legal professionals had a lower profile as they functioned as online references and some joined the audio conference on Careers in Law.

Personal Mastery (Legal Professionals)
In a number of situations, Law Mentor directs questions to members of the professional, legal community. She attempts to involve students in conversation with the professionals and encourage the students to discuss issues arising from the course material or their personal lives.

In one instance a student directed a question to the legal professionals. A judge from the Queen Charlotte Islands responds

Monday, December 11, 1995 2:28:45 PM
Law 12 Forum Item
From: Law Mentor
Subject: The Legal EAGLE Responds
To: Law 12 Forum
Today I received a fax from the Queen Charlotte Islands from a Provincial Court Judge who simply signed his response, ‘The Legal Eagle.’ So now we have both Beagles and Eagles involved in our forum!

It is a response to the Family Law question sent in by Corrie a few days ago. You may want to read that question before you read the response.

Since it was in the Judge’s handwriting, I will transcribe it here:

The response follows with clear suggestions of the procedure to follow and a legal opinion based on precedents. In a different situation, Law Mentor asks for advice “I don’t know much about the law of fugitives. Does anyone out there? Ron Rapin--are you looking in with your Legal Beagle wisdom?” (Law Mentor, Law12 Online Conference Messages, Winter 1996). The next day, Ron replies

Thursday, February 8, 1996 8:15:30 AM
Law 12 Forum Item
From: Ron Rapin
Subject: Re(4): Fwd: Re: Capital Punishment and Extradition
To: Law 12 Forum
Hi Law Mentor, yes I am looking in (from the office, still haven’t got the MAC functioning well) Actually I am enjoying the comments that are being posted. The range of comment is fascinating and well considered. there are large groups of population that agree with each comment. You should be proud of this group. Will try to get a toe in shortly. Regards.

While the interaction among students and the legal professionals was limited, the potential access to legal professionals was a rich resource for the course.

Collaboration - Social Interaction (Legal Professionals)
An audio conference was devoted to the topic of careers and the law. Legal professionals involved in the audio conference pre-posted their pictures and biographies to the Law Forum, and students were encouraged to contact these individuals directly via e-mail. Students were also encouraged to contact these people after the conference had taken place in case there were further questions.

Law Mentor asked that those students who had participated in the audio conference share their experience with the others.

Thursday, April 25, 1996 1:21:45 PM
Law 12 Forum Item
From: Student 4
Subject: RE: MAJOR CORRECTION
To: Law 12 Forum

... As for the last Audioconference, we talked with Deputy Sheriff Tom Collins, Ministry of the Attorney General, we talked with Dennis Thrift, assistance Officer in Charge, RCMP Forensic Laboratory. and we talked with Facilitator 2King, Court Reporter, Ministry of the Attorney General, The Law Courts. Much of the things they each told us is also in their biographies found here in the Law Forum. It was much better talking with them in person because it made them seem more real and they could tell their stories with more details and personality. I found it interesting to know hat the court reporter in still so important even with all the new technology because he gets downs every word said and produces a reliable source of everything that went on all numbered and everything. It was also interesting to find out these law related jobs were available. I think it was Tom Collins, Deputy Sheriff, that pointed out that girls are wanted and respected in his field. He said that he personally enjoyed working with a female officer more than a fellow male one because the accused or suspected people they have to deal with feel more comfortable and don’t have to put on such a macho act and things run much smoother. I thought Dennis Thrift had a real neat job investigating all kinds of evidence and how his ‘expert’ opinion was important in real criminal trials involved with murders, assaults, etc. I thought it was really great that these important and probably very busy men took the time to come and talk to use. That’s all for now.

Another student gave his point of view

Tuesday, April 30, 1996 12:52:21 PM
Law 12 Forum Item
From: Student 9
Subject: Second last audio
To: Law 12 Forum

I will fill you in as well in my point of view. They talked first about their lifes in detail which I didn’t understand much but maybe they were trying to show us what they were like when they were our age. Then they discussed what their careers involved and the schooling you need and what they did during there job day.

Tuesday, May 2, 1996 12:06:09 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re: Second last audio
To: Law 12 Forum

Telling about one's life before telling about the actual career is called a Career Path. It's a good way to get listeners to understand how the speaker got to where he or she is today. Most of us didn't arrive on earth saying something such as, 'Here I am--born to teach!' We did quite a few other things before we realized where we wanted to be. Too many students feel pressured to select a career before they have a chance to explore a bit. Thanks for your response, Matt.

Active students had access to legal professionals if they wrote to them or asked for assistance. The legal professionals did not take a proactive role in the NDDL computer conference.

Project Team

NDDL Instructional Design (Project Team)

Unlike previous years, the project team was very low profile. They monitored the conference and only participated in issues related to enrolling students, issuing identification names and passwords, etc. While the facilitators and mentors could turn to them for technical and program assistance, the students participated with them online only in situations concerning computer identification (logon ID's) and enrolment. OLA Staff 1 came online twice to announce that Law Mentor's computer was broken, and Project Team 3 sorted out an ID error.

In terms of the learning triad, the project team really did not have an overt role; however, they did have control over the courses offered and the enrolment of sites and students. The task of ensuring that sites participated and that funding and MoEd support had been secured fell to them. All the handbooks and curriculum materials which had been developed and circulated through the project team and the summer symposium was their concern.

While not clearly represented in the triad model, the project team was involved in every aspect of the program and had a clear impact on student success and opportunity.

Key Conclusions

Returning to the initial questions of this section, (1) was Law 12 a community of students and (2) did learning as knowledge-building take place, the research on the 1995-1996 academic year would suggest that the Law 12 course was, at times, a community of students and the potential for learning did exist.

When the completion rates for the course were reviewed, the findings were surprising to all (mentor, project team, and the researcher). Law 12 and Law Mentor
were thought to be the most successful examples of the NDDL instructional model. In many ways, this research shows that this is true.

One of NDDL's stated intentions was to improve the traditional correspondence student success rates. This in fact happened, but not at the level previously cited. DES success figures are somewhere between 11 and 18%; Law 12 rates for 1995-1996 were 35%.

After the completion rates for Law 12 had been analysed, Law Mentor was asked to confirm them. While she was surprised, she stated:

About a quarter of the way through the year I began messaging ... [the project team] regarding my stats. The year before they were better. I had fewer students, but I believe we had been more selective about the sites. I am now at the stage when I can guess what percentages will complete by the sites I have. Of course, I am not always correct, but reasonably.

The response I got from admin. [project team] was that many of the people who sign up for these courses have a history of dropping out, so we can expect our stats to be worse (Law Mentor, E-mail Communications, November 13, 1996).

Law Mentor added that she would review the completion rates from her other courses as "... I may be focusing on the successes" (Law Mentor, E-mail Communication, November 13, 1996). Law Mentor is probably not alone in doing that. Student achievement is seductive, and teachers tend to remember the students who make the greatest improvement or overcome the greatest obstacles. However, a basic measurement of program success, completion rates, suggests that the NDDL model for Law 12 is more effective than traditional correspondence but less effective than the project team and participants believed.

A key issue to improving the NDDL instructional model will be allowing the mentors a stronger say in the development of curriculum. If the NDDL goals of flexible program delivery, customised course materials, and empowered self-motivated students are to be reached, mentors must be allowed and encouraged to customise the curriculum. Also, if the NDDL instructional model is to work, the marking scheme must reflect NDDL conference participation and activities that require higher order thinking.

It appears the instructional design and course curriculum must be modified to reflect the constraints and opportunities of the new technologies used to deliver the project or NDDL will simply become a "high tech" provider for the traditional DES instructional model. Courses must be designed to make use of the computer conferencing system and the potential for audiographic conferencing. Therefore, professional development opportunities must be offered to assist teachers (mentors and facilitators) and project team members to develop strategies to maximise the potential
afforded by the new technologies and encourage online social interaction. The encouragement of social interaction is a key component for the stimulation and encouragement of knowledge-building of all participants. Social interaction among all members of the learning triad will encourage the educators in the project to see themselves as students which will be essential if NDDL is to return to innovative practice and become an organisation for learning.

The present curriculum and instructional model allows students to choose either the DES or the NDDL instructional design. Until the NDDL marking / evaluation scheme is modified to reflect online participation, students will be left to determine their own participation levels. Also the critical mass of interaction required to create a community of students may not be generated. Currently, the *Law 12 Student Guide* (Ministry of Education & Open Learning Agency, 1995, p. 3) contradicts the stated intentions of the NDDL project. Terms such as "If you are going to take part in audioconferences ... , If you are joining in any audiographic teleconferences ... , If you are joining in any computer conferences..." suggest there is an option to participation. Until participation is integrated into the course design, many students will not engage in the higher order thinking opportunity afforded by the NDDL instructional design.

Because student participation and the development of a strong learning triad appear to be at the core of the NDDL instructional model, all members of the triad must fully understand the instructional design and procedures required to support that design and be committed to work within it. Unless this happens, the educators will continue to default to the practices they understand. Additional professional development and support must be given to the educators to encourage their knowledge-building and personal meaning making of the innovative practices afforded within the NDDL instructional design.

As with any team, the learning triad will be as strong as the weakest members; therefore, communications among triad members must be encouraged and supported. Facilitators were assigned roles which were radical departures from their traditional teaching practices; however, they were given little support and/or assistance in defining their roles and determining appropriate strategies. As the responsibility for the course context had been assigned to the mentors, the facilitators were to assist students in knowledge-building. Ironically, the facilitators were given little or no opportunity to build their own knowledge for their new roles and therefore appeared not have the skills required to model learning in this new instructional design. As stated before, the educators, as well as the students and the project team, needed to be active participants in a community of learners if NDDL was to continue developing innovative practice.

While the Staffroom Forum in the First Class conferencing system encourages mentor / facilitator / project team interaction, students are not allowed in that conference. In order to share the needs of the students with the mentors and facilitators and to
develop the interaction of the triad in the online environment, a forum might be created to support dialogue among the learning triad around student learning plans. These learning plans could be modified as needed, linking all the individuals together so they can work as a team to accomplish the common goal - student success.

Without this interaction, mentors will continue to teach only those students with enough personal agency or facilitator support to show up in the computer conferences or attend the audio conferences. Without ongoing communication, such as the knowledge-building discourse described by Scardamalia and Bereiter (1994) and Cazden (1988), the specific goals and needs of the students may remain lost to the mentors.

It appears that increased interaction is required from all NDDL participants to establish a community of learners online, to create an environment for learning for all members of the triad, and strengthen the NDDL instructional design. Establishment of a virtual community, actively moderated by a team representing all the members of the learning model (Figure 28) and including all the members of the learning triad, might be a method to develop an organisation for learning and create a culture of knowledge-building and a climate supportive of continuous learning. This might allow NDDL to return to its initial stated intentions and build on the strengths of its first year of operation.
SECTION C - STRATEGIES TO ENCOURAGE INTERACTION AMONG MEMBERS OF A LEARNING COMMUNITY

Introduction

It was the initial assumption of this research that a community of learners would form within the Law 12 course. However, after analysing the data, it became apparent that this had happened in only a limited manner. While there were instances of community type interactions occurring, they were not sustained or necessary for the completion of the Law 12 course. This section explores possible reasons for this.

Walls (1994, p. 156) suggests that communities develop "... from the mutual involvement, mutual responsibility, and mutual respect between a society and its individual members." By the time this research was conducted, year three of the project, participants appeared to have little input into the organisational structure (Chapter Four) - Wall's notion of mutual participation was missing.

Brown (1994) identifies five steps required to develop a community of learners (Chapter Two - Section A). The fifth step is the development of a community of practice within the learning community. A community of practice is consistent with the characteristics of a knowledge-building communities (Scardamalia & Bereiter, 1994) and the three disciplines identified as being essential for organisations for learning presented in Figure 7. A community of practice differs from a community of learners as it is more task or content specific. It provides the insider view of actual practice in field.

The NDDL Law 12 course is a natural location for the formation of a community of practice as the participants have opportunities to interact directly with experts in the legal profession. In a direct instruction model (traditional classroom), learners enrolled in Law 12 may visit an actual court room and occasionally have legal professionals come to their classrooms for guest visitations, but normally there is little or no opportunity to maintain contact.

The NDDL model allows for a different version of this professional interaction. Sustained, reflective, continuous contact with legal professionals is offered via the online Legal Beagles, who monitor the conferences, responding to e-mail and participating in audio conferences. Because of this format, learners can ask additional questions and sustain interactions well after special events are over. Learners can also participate in Mock Trials via audio or computer conferencing. These options provide learners an opportunity for social interaction with a community of legal professionals, offering learners a community of practice in which to interact (Law Mentor, E-mail Communications, Fall 1995).
Crichton (1993) develops criteria for analysing the use of expert practice, the technique used by experts within a community of practice to share the processes or "tricks of the trade" used in the real world of work. These criteria will help to code the online social interaction among Law 12 participants and analyse the discourse.

Social interaction between participants not only helps to construct meaning for the learners, but it also assists the learners build their "... evolving form of membership" (Lave & Wenger, 1991, p. 53) in the community of practice. Learners are not instantly full, active members of the online Law 12 community; they must develop that membership through meaningful participation and thoughtful social interaction. This developmental approach is widely supported in the literature, especially in the work of Vygotsky (1978, 1981, 1986), which views social interaction as essential for all higher mental functions.

A question that keeps occurring in this research is why more social interaction among participants did not take place. Among the various reasons presented in the preceding sections, could be the fact that individual attributes (Figure 29), required to encourage participation in the NDDL instructional model, were not formally taught. It appears that it was assumed learners (educators and students) would either come to the program with these attributes or develop them independently as they participated in the instructional design.

Figure 29 is developed from outcomes expressed in DES documentation, NDDL project handbooks, and various Ministry of Education materials.

<table>
<thead>
<tr>
<th>DES - LEARNER ATTRIBUTES FOR SUCCESS</th>
<th>NDDL LEARNER ATTRIBUTES FOR SUCCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ability to work independently (potential involvement with facilitator and marker)</td>
<td>1. Ability to work independently (active involvement with facilitator and mentor)</td>
</tr>
<tr>
<td>2. Self-motivation (potential supervision from site base facilitator and development of learning plan)</td>
<td>2. Self-motivation (potential supervision from site base facilitator and development of learning plan, plus online mentor)</td>
</tr>
<tr>
<td>3. Ability to follow directions (usually print based)</td>
<td>3. Ability to follow directions (often print based but potential for clarification via e-mail, conference, audio conferencing)</td>
</tr>
<tr>
<td>4. Ability to locate resources</td>
<td>4. Ability to locate resources or request additional materials online or via Internet; use online experts</td>
</tr>
<tr>
<td>5. Ability to seek assistance - phone marker</td>
<td>5. Ability to seek assistance from a variety of resources (triad members, online experts, Internet, etc.)</td>
</tr>
<tr>
<td>6. Ability to reach set standards</td>
<td>6. Ability to reach set standards and negotiate additional standards to meet personal needs</td>
</tr>
<tr>
<td></td>
<td>7. Ability to join a community of practice and develop social skills required for participation in social dimension of group</td>
</tr>
<tr>
<td></td>
<td>8. Ability to begin to develop a personal perspective on material and express it</td>
</tr>
<tr>
<td></td>
<td>9. Ability to participate in a cooperative learning environment</td>
</tr>
</tbody>
</table>
Figure 29. Attributes for success

It is an assumption of this research that the ability to develop the NDDL attributes requires learners to become pro-active and empowered about their own learning. For a student to function in the NDDL instructional design, s/he must become actively engaged in the learning process. There are many variables affecting an individual’s ability to become actively engaged which activity theory informs (Figure 5). However, the assumption, implicit in the NDDL instructional design, that learners (educators or students) can independently acquire all the attributes appears to be incorrect.

Stated Intentions

Throughout the NDDL documentation, 1993 - 1996 project handbooks specifically, the development of a community of learners, including all members of the learning triad, is mentioned. In the 1994-1995 Project Handbook, the vision of community is expanded to include those individuals who could be used as learner resources.

Consistent in the NDDL documents is the assumption that the development of community would enrich the learning experience by promoting knowledge-building. The Law 12 Student Guide (New Directions in Distance Learning and Open Learning Agency, 1995, p. 8) goes a step further by introducing the community of legal professionals with whom the learners can interact. By incorporating the Legal Beagles into Law Mentor’s instructional design, she invites the learners to explore the world of law through the eyes of the legal professionals. Her intention is that learners will be given opportunities to “Investigate important personal and social issues and assess alternative legal responses in light of individual interests and social concerns ... [and ] Communicate effectively with professionals.” Both of which encourage the development of a community of practice.

Actions

Depending on numerous of variables (eg. personal attributes, individual learning plans, personal commitment to learning, facilitator involvement, etc.) learners
approach the Law 12 course differently. The learner attribute chart (Figure 29), ranks the attributes in increasing levels of agency with number 13 being the most advanced. While students could complete a course having developed only one or two attributes, it is an assumption of this section that learners could not develop full membership in the community of legal practice without at least developing the first seven attributes.

The criteria developed by Crichton (1993) will be used to view the interactions between conference participants. These criteria include expert practice, developed membership in a community of practice, dynamic criteria, expert process, interaction with experts, learning environment, and reference to resources.

**Learner Attributes**

Because so few students completed Law 12 and participated online, there is little evidence of the learner attributes. Of the eight learners who did complete the course, there is evidence that six of them possessed at least the first six attributes shown on Figure 29. Because these six learners participated in the Technology Challenge, there is material in the electronic archives to support this statement.

Attributes 1 and 2 suggest that learners must take ownership for the course work and make statements about how they will complete the material. In Law 12, six learners sent messages to Law Mentor, indicating they were ready to start the course. All expressed statements suggesting they wanted the Law 12 credit and were interested in the subject.

**Wednesday, October 11, 1995 3:02:23 PM**
Law 12 Forum Item
From: Student 3 ...
Subject: Just Saying HI
To: Law 12 Forum

HELLO EVERYONE! I'm Student 3 ... from ... and I figured I should probably sign on and introduce myself. I'm just trying to figure out what's going on, and how this whole Law course is supposed to work. Looks like it could be fun! Talk to you all later! Student 3

**Wednesday, October 11, 1995 4:42:14 PM**
Law 12 Forum Item
From: Law Mentor
Subject: Re: Just Saying HI
To: Law 12 Forum

Welcome Student 3!
I promise this course will be fun--and informative. We are hoping to get an audio conference together by the end of the week. How about letting me know what time of day is best for you, generally.
Regards, Law Mentor
Student 3's message is similar in tone to the other messages. She expresses interest in the course and sets out to do the work. Law Mentor responded to all the messages, reassuring the learners and encouraging them to jump in and get started.

Once the opening messages had been sent, two learners explained that they were not confident about their understanding of the directions presented, so they asked Law Mentor to clarify issues related to sending assignments, etc. (Attribute 3).

Monday, October 23, 1995 10:34:37 AM
Law 12 Forum Item
From: Student 5
Subject: Re: Audio #1
To: Law 12 Forum

Hi there! I'm writing because I am new to the course, and just received my materials but unfortunately I have missed the first audio conference. I was wondering whether you would be able to reply as to when the next one is being held, with maybe a small explanation, I'm feeling somewhat confused.
Thank you, Student 5

Law Mentor patiently referred them to references in the documentation and sent specific e-mail directions about how to participate. The word patiently is used here because all the facilitators had been shown the process during the summer symposium and all had the supporting reference materials. Theoretically, all facilitators knew that explaining the process was part of their role. Regardless, Law Mentor sent many messages explaining and re-explaining the process to the learner, rather than leaving the learners confused or relying on the facilitators to do that portion of their jobs.

Attributes 4, 5, and 6 were demonstrated by the six learners when they asked for help, either generally to all the Law 12 conference or specifically to Law Mentor via e-mail. The ability to form questions and direct them to the correct people is important, as the alternative is passively sitting back, doing nothing, waiting for someone to help. In terms of achieving goals (Attribute 6), eight learners received grades, and seven reached the standard for course completion and passed with an average of 78%. One learner did receive a failing grade and did not get credit for the course.

There is some limited evidence of attributes 7 through 13. One learner, Student 6, contacted the Legal Beagle and sustained communication. This is the only instance of a learner writing the online legal professionals for assistance available in the public Forum. Other communications could have taken place via e-mail and not been available for this research. Unfortunately, Student 6 could not directly write to the judge; the message had to be passed via Law Mentor. This possibly limited the social interaction as it was not direct communication.

Tuesday, December 12, 1995 12:43:07 PM
Law 12 Forum Item
From: Student 6
Subject: Legal Eagle
To: Law 12 Forum

Hi,
Thanks a lot for helping me out with my question, but I don't know what other information I can give you. All agreements that they made were verbal. Yes, a big mistake, but irreversible, and verbal contracts are still binding aren't they? The mother would love to talk to a lawyer, but she simply can't afford it. [more details are presented] ... I don't understand the whole concept. Could you please help me out once more? Thanks a million. Regards, Student 6

It is unclear from the Forum messages whether this interaction ended with the December 12th message or if the Legal Beagle, via Law Mentor, responded further through private e-mail. However, in terms of the community of practice online, the interaction stopped. Law Mentor was also able to function as an online legal professional because of her knowledge and experience in law. She was able to adapt the curriculum, tying it to current events.

Wednesday, February 7, 1996 11:28:10 PM
Law 12 Forum Item
From: Law Mentor
Subject: Question of the week!
To: Law 12 Forum
Now that you are really involved with applying your legal knowledge to current events, here's a question for you.

What event occurred within the last twenty-four hours which caught national attention and challenged the rule of law?

In giving me your answer, explain so that anyone not understanding the rule of law could understand--give me your opinion using that tactic to make society aware of an issue.

Thursday, February 8, 1996 9:56:23 PM
Law 12 Forum Item
From: Law Mentor
Subject: No news watchers?
To: Law 12 Forum

Still waiting for an answer for the question I put in yesterday under "Question of the Week." I thought for sure STUDENTS would have noticed this event--which took place in a number of places in Canada. Does that give you a hint?

Friday, February 9, 1996 11:04:45 AM
Law 12 Forum Item
From: Student 4
Subject: Re: Question of the week!
To: Law 12 Forum
The event is that the president has decided that there won't be freedom of speech on the Internet. This challenges the rule of law because the rule of law is a legal principle that society is governed by law that applies equally to all and this is saying there won't be freedom of speech only on the internet. Freedom of speech is one of our rights.
Gervais at your service.

Friday, February 9, 1996 10:03:45 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re(2): Question of the week!
To: Law 12 Forum
That's a good response, Student 4—that was a major issue—and I will have to consider that a really good answer—even a correct one because it does fit the description I gave, but I hope you can also come up with the actual one I had in mind.

For this 'peaceful protest' which ended up not being so peaceful, some young people could get up to 14 years in jail. These protesters were charged under Section 51 of the Criminal Code.

Now if any of you are within reach of a Code, you have it made.

An interesting observation concerning the above exchange is that Student 4 placed herself in the community of Americans when she referred to the president who had stated he was opposed to unlimited freedom of speech on the Internet. While freedom of speech is a right assumed by Canadians, it is not expressed in the Charter of Rights and Freedoms nor does Canada have a president. By sharing a common border (and media) with a bigger neighbour, the United States, Canadian students often become confused as to which community of legal practice they belong!

Attribute 8, the development of a personal perspective, is evident in many online interactions. As stated in an earlier section in this chapter, learners often found their perspectives changing either after studying a particular legal issue or after hearing another perspective.

Tuesday, February 13, 1996 11:46:19 AM
Law 12 Forum Item
From: Student 7
Subject: Consider this
To: Law 12 Forum
Since there is so much talk about capital punishment I thought I would bring up another interesting topic. When I did my Law assignment this morning ABORTION was mentioned as being murder to some people. I know this is NOT the same as capital punishment but it is taking a life and part of your body (that is for girls). I'm not sure but it is your decision.

Thursday, February 15, 1996 9:30:49 AM
Law 12 Forum Item
From: Student 1
Subject: Re: Consider this
To: Law 12 Forum
Student 7 if you are talking about abortion I think it is your decision and only your decision. Nobody else knows the circumstances of why you would want or not want an abortion so I wish people would mind their own business. Don't get me wrong but don't you think it is up to you. What does everyone else say about abortion?

Thursday, February 15, 1996 10:07:29 AM
Law 12 Forum Item
From: Student 7
Subject: Re(2): Consider this
To: Law 12 Forum
I do agree with you. It is only your decision.

While this discussion did not generate any further responses, it did encourage those two learners to consider their personal perspectives and express their points of view. Exchanges such as these occurred at various times without the academic year.

Attributes 9 and 10 are interconnected as learners appeared to attempt the negotiation of meaning online during the only cooperative learning activity - the mock trial. This mock trial was to be conducted during an audio conference; however, that did not happen and the trial took place in a modified manner online, in the Law 12 Forum. Learners were encouraged to define their own roles for this trial and to sign up for whatever interested them.

Tuesday, March 26, 1996 8:59:03 AM
Law 12 Forum Item
From: Law Mentor
Subject: Mock Trial - Audio
To: Law 12 Forum
I now have a new mock trial ready for us to perform--just ourselves during an audio conference.

We will find a time when all participants are able to make it--if that fails, we will do it here, where time isn't a concern. I haven't tried doing a mock trial online or during an audioconference before so it should be an adventure. ...

Simply let me know if you want to be a lawyer or a witness and I will send you your files! If you chose lawyer, specify a preference for Crown or Defense. The first to apply get their first choices.

The mock trial is entitled R. V. Joey Brock--it is an arson causing death case--thus, Joey is charged with second degree murder. I will put the indictment in the next message.

Three messages from Law Mentor followed this one, supplying the necessary preliminary information. Then, the learners started to apply for positions.

Wednesday, March 27, 1996 11:31:06 AM
Law 12 Forum Item
From: Denise Senez
Subject: Re: Mock Trial - Audio
To: Law 12 Forum
Law Mentor, I would love to be a crown lawyer in this case. Denise

Wednesday, March 27, 1996 3:37:44 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re(2): Mock Trial - Audio
To: Law 12 Forum
Ping! You're a Crown Counsel, Denise. Your co-crown is Student 7. Now we need a couple of defense counsel and some witnesses.

Thursday, March 28, 1996 3:16:44 PM
Law 12 Forum Item
From: Student 9
Subject: Mock Trial
To: Law 12 Forum
I would like to be part of the crown council!

Thursday, March 28, 1996 8:11:57 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re: Mock Trial
To: Law 12 Forum
If you don't mind, Matt, I will make you a defense counsel--need some balance here--if that's a problem, let me know and I will be defense against the whole NDDL Law 12 group. Law Mentor

The messages continued like those above, and learners prepared for the trial. The mock trial was the only regularly scheduled cooperative learning event.

There was no evidence of Attribute 11, the development of group goals, but there was evidence of Attribute 12, the completion of personal goals and objectives. One learner demonstrated keen interest in law. She participated in all the activities and received one of the highest grades, 91%.

Saturday, April 27, 1996 8:45:24 PM
Law 12 Forum Item
From: Mentor 8
Subject: Congratulations Student 5!
To: Law 12 Forum
I would like to offer my congratulations to Student 5 for winning first place (and a $300 scholarship from Armstrong local lawyers) in the Current Affairs category of the Armstrong District Speech Festival.

Student 5 did a 5-minute prepared speech on the topic of whether or not plea-bargaining should be permitted. She is to be commended for doing an excFacilitator 3t job...

Monday, April 29, 1996 4:16:17 PM
Law 12 Forum Item
From: Law Mentor
Subject: Student 5 & Student 10!
To: Law 12 Forum
Way to go Student 5! Congrats on the Law Week Speech Contest.

Now is the time to announce that Student 5 and Student 10 are the winners of the Careers in Law contest. Remember when you were asked to submit articles for the NDDL Web Newsletter? Well, they did it and will be published.

Way to go, Student 5 & Student 10!
Participation in activities such as the mock trials, speech contests, etc. suggest a higher level of commitment than the average learner who simply completes only the work put in front of him/her. The ability to plan ahead, make goals, and participate in extra activities all appear to reflect a higher level of personal agency and the development of an increased number of learner attributes.

The final attribute, personal empowerment and self-direction, was demonstrated by only one learner, Student 7, in the Law 12 Forum. While not among the top learners in the course (measured by grades), Student 7 participated in every activity offered in the NDDIL instructional model. Near the end of the academic year, a graduate student at Simon Fraser University, Guest 1, introduced the concept of a MOO environment (see p. 184 for description) for mock trials. He uploaded a beta version, and while there were numerous technical problems, Student 7 was the only learner to explore it, even though there was no course credit for participation.

Wednesday, May 29, 1996 3:15:33 PM
Law 12 Forum Item
From: Student 7
Subject: Re: How goes the MOO?
To: Law 12 Forum
just to let you know, I’m trying to connect now. =) I got the welcome screen and forgot what to do next. =( (so I hope to have something accomplished by 3:30 =)

Both Guest 1 and Law Mentor replied to Student 7’s message; Guest 1 offering the technical solutions Student 7 needed.

Law 12 Forum Item
From: Student 7
Subject: Re(3): How goes the MOO?
To: Law 12 Forum
Well, actually I did make it in there by 3:30. I just played around with it a little bit since I didn’t have a whole lot of time to do too much. I won’t have any time in the next 2 days. I’m busy getting ready for grad tomorrow night. Ahhhhhhh, I’m having nightmares about it too. Oh, well.....time for me to get back to work now. Bye =) Student 7

Thursday, May 30, 1996 11:51:40 AM
Law 12 Forum Item
From: Law Mentor
Subject: Re(4): How goes the MOO?
To: Law 12 Forum
Well, let’s try to do something there next week, Student 7.

Wednesday, June 5, 1996 8:34:03 AM
Law 12 Forum Item
From: Student 7
Subject: I made it =).........further
To: Law 12 Forum
I just wanted to let everybody know I made it a little further into the MOO yesterday. =) I checked to see who was online and I saw Guest 1 on. I figured out how to 'page' and 'chat'. So I had a chat with Guest 1. It was quite neat. All those that haven't had a chance to explore MOO yet. I suggest you give it a try sometime soon. You may just enjoy it. I did. =)

Friday, June 7, 1996 12:51:08 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re: I made it =)..............further
To: Law 12 Forum
Thanks Student 7--so far I think you have the prize for accomplishing the most in there! If anyone else has managed to get in and do any neat things, please let us know.

There was no response to Law Mentor's message as no one was participating in the MOO. Technical difficulties and the time of the year were blamed for the lack of participation. Student 7 ended her Forum interactions with a note on June 18. She was the last learner on the Forum. The server which held the MOO conference had fallen off its table and crashed, stopping interaction for almost a week. Student 7's message refers to that situation.

Tuesday, June 18, 1996 4:23:26 PM
Law 12 Forum Item
From: Student 7
Subject: Re: The MOO is back
To: Law 12 Forum
I totally forgot that the MOO was down. I spent some time in there today actually. I tried writing on my document. Then I hit enter and the thing went up in the screen. I wasn't amused. Oh well...... maybe I will get a chance to spend more time during the summer since I am finished (completely) my law course. Student 7

Thursday, June 20, 1996 1:34:51 AM
Law 12 Forum Item
From: Law Mentor
Subject: 
To: Law 12 Forum
......................... maybe I will get a chance to spend more time during the summer since I am finished (completely) my law course.

I'll vouch for that!!!!!! :)

It is interesting that the final exchange shares a common sentiment from the viewpoint of a community of learners - fatigue and relief that the course was over. Both people (learner and mentor) were still online, exploring a new feature of the program, even at the every end of the academic year. It would appear that both members felt personal empowerment to explore the MOO environment and were self-directed enough to withstand the technical glitches of something new.
Community of Practice

There is potential for the development of a community of practice within the Law 12 course. As stated in Section B, the legal professionals have had a prominent role in online legal education in British Columbia since the late 1980s. In the first two years of the NDDL Law 12 course, these professionals played a major role in audio conferences and sustained online conference communication. However, with the exception of the audio conference on legal careers and the occasional Forum message, their presence was noticeably absent in year three.

Although recognising that their participation was minimal during this research, it is still relevant to discuss the potential for the establishment of a community of practice and the role that it could play to encourage online social interaction. Often in the Law 12 Forum Law Mentor pleaded with learners to get involved and get discussions going. Only a few times was there a critical mass of interaction, and at those times, it was of short duration. In her opening message, Law Mentor had tried to encourage learners to introduce themselves online and make contact with the other participants. A few did, but as the following note suggests, there was little activity.

Monday, October 16, 1995 4:15:58 PM
Law 12 Forum Item
From: Student 4
Subject: Helliiloooooo?
To: Law 12 Forum
Where is everyone? Why am I the only one who has been here for the last 3 days? Am I alone in this world? Please respond sometime soon...

Student 4 got a response from Law Mentor, but no learner directed a comment to her in the Forum. When one learner, Student 3, made a general comment to the Forum, Law Mentor complemented her and again tried to encourage conference participation.

Thursday, October 19, 1995 4:22:34 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re(3): Law Mentor: Assignments again
To: Law 12 Forum
Good show, Student 3.
What do the rest of you think? Either jump in and agree or give some alternative suggestions.

Regards, Law Mentor

While there were the occasional comments, there was little interaction in the Forum.

Wednesday, November 29, 1995 10:00:23 PM
Law 12 Forum Item
From: Law Mentor
Subject: Calling All Beagles!
To: Law 12 Forum
I haven't seen much action here for a while, but I am getting a lot of e-mail from law students as more and more of you get signed on to this system.

One adult learner, Student 11, suggested that if there had been more activity online, learners would have felt freer to write online. "People, I think, do feel more free to participate in active discussions and are more willing to share thoughts and ideas. In my opinion, I think that because most people are shy on a one to one basis for awhile" (Student 13, E-mail Communication, Spring 1996). It does appear that a critical mass of activity is necessary to promote and sustain activity; however, that is both the challenge and the solution!

Learners who used the First Class Conferencing system seemed to write more e-mail messages directly to Law Mentor than they did to each other or to the Forum group. This is consistent with the literature concerning group work and the early stages of the formation of intellectual teams. McGrath (1990, p. 33-34) states that once a group has been presented a task, there are four stages that the team members go through: (1) inception; (2) problem solving; (3) conflict resolution; (4) and execution. In the case of Law 12 group work, it appears that participants rarely moved past stage one. McGrath suggests stage one is

... an interaction opportunity (and demand) from the point of view of group well-being. It is an inclusion/participation opportunity (and demand) from the point of view of the individual group member. It offers inclusion of that member in the group, in return for participation, loyalty, and commitment by that member to the group. All opportunities come tied to potential costs, risks, and dangers. Member participation in a group process involves balancing of interpersonal openness and closedness, of privacy and intimacy.

It appears that learners were not able to assess the personal benefits of group participation and therefore tended to feel that the risks (loss of time, danger of having work taken by others, potential embarrassment by offering a wrong answer, etc.) were too great. One learner stated that she did not want to share her work online because the other students would take it and give nothing in return (Student 3, Interview, July 1996). This comment is reflective of the sense that marks and course evaluation were still thought to be based on competition between the learners, not on cooperative interaction among the learners.

Law Mentor made numerous comments such as

Let's get the class discussing here; I am keeping track of who respond here and how often; So carry on discussions here-- ; Please respond--
really hope to keep this discussion going--getting responses to one an
other's response Your thoughts? Yes, that's what I was hoping to see
here--lively discussion (NDDL Archives - 1995 - 1996)

The last comment regarding the lively discussion referred to the topic Capital
Punishment and Extradition. There were 21 messages exchanged between February 4 -
9. This was one of the few social interactions which clearly prompted knowledge-
building and involved Law Mentor; a Legal Beagle, Ron Rapin; and five learners.
While Law Mentor made 10 of the comments, the others did interact, extending the
topic and prompting reactions.

In the first year of NDDL Law 12, Law Mentor conducted two audio
conferences which are still memorable to the learners and facilitators who were
involved. Both cases involved controversial topics that were taken directly from current
events. The first involved the logging protests at Clayoquot Sound (described in
Section B - Legal Professionals), and the second dealt with an adoption case. In both
cases, Law Mentor circulated pre-reading materials which formed a legal context for the
audio conference. Prior to the audio conference, there was Forum discussion and
questions for the individual learners to consider. The learners had been given the task
of preparing for the discussion, the responsibility of drafting questions for the audio
conference participants, and the role of asking questions during the audio conference.
When the audio conference started, Law Mentor introduced the legal professionals who
were involved. In both cases, the professionals represented the full spectrum (legal
professionals, Ministry bureaucrats, defendants, witnesses for the prosecution, etc.)
By the end of the audio conference, opinions were shared, tempers had flared, and a
range of opinions had been formed or reformed. Participants at those two events
experienced the range of legal process and had been exposed to a variety of individuals;
they experienced a community legal practice in action. However, this type of event did
not happen during the third year of Law 12 (Research Notes, 1993 - 1994).

As stated earlier, the development of a community of practice is essential to the
development of cognition because participation in a community of practice develops the
skills required for social interaction (Lave & Wenger, 1991; Vygotsky, 1986; and
others). Rephrased, expert practice encourages social interaction (Crichton, 1993).

Social interaction is one of the skills missing from traditional correspondence,
but it is one of the promises of the NDDL instructional model. Therefore, it is of
concern that social interaction was limited in the actual practice of Law 12, which has
been cited as one of the most popular and successful of the NDDL courses, and its
mentor, Law Mentor, acknowledged as a model mentor.

Expert practice, or cognitive apprenticeship, is one of the first criteria identified
as a basis for a community of practice (Crichton, 1993). Expert Practice is the sharing
of the process that experts use to handle complex tasks (Collins, Brown, & Newman,
1989). It is the sharing of both the conceptual knowledge of a discipline as well as the factual knowledge. This process is actually taught to new members of the community, focusing on

... the contexts of use (application) and task (situated learning activity). By situating the knowledge in a specific context, the learner can develop a deeper understanding of the meaning of the concepts and facts, establishing a web of association between concepts and facts within real problem solving contexts (Crichton, 1993, p. 43).

Law Mentor presented the opportunity for expert practice, but the opportunity was not acted on. She had previously explained the background concerning the Legal and stated

... So, I am proposing we bring him [Legal Beagle] back right in the Law 12 Forum. You ask your questions here...and, if I can find someone who is a professional in the area that you have asked ... I will get an answer for you. This will make our forum more lively and the course will be relevant to you because you will see how the law REALLY works or maybe even that it doesn't. ... Simply type 'Legal Beagle’ ... as your subject alert to us that we have a question or comment not necessarily related to what you are reading in your text (Law 12 - Online Conference Messages, 1995 - 1996).

Seeing how the law really works captures the concept of expert practice. Law Mentor knew that inviting the learners into this dialogue would allow them to experience actual law in a situated task which was relevant to them. The potential and value for this type of practice cannot be over-stated. However, the system of using Law Mentor as messenger to the Legal Beagles made the process indirect, and the learners only used it once when Student 6 exchanged messages concerning a question of family law. One learner, Student 3, stated she felt that interaction via electronic conferencing and/or e-mail did not give her any direct feedback because she did not really feel that she knew what the other participants really thought. A key to Student 3's concern is the issue of direct communication. While the time delay in e-mail did not encourage her to interact socially, having Law Mentor place yet another step in the direct communications appeared to make the situation even worse.

The gradual development of membership in a community of practice is the second criteria. As learners learn to participate in this actual practice, they begin to experience a virtual legal environment. There the learners can experience what the world of law is about and begin to sense the culture surrounding the legal process. This requires developing an evolving membership as new learners would have to acquire the skills necessary for full participation. These skills would include an understanding of legal terminology, background, procedures, etc. Law Mentor
attempted this with the online mock trial and the mock trial audio conference. In these settings, learners could assume the actual roles of legal professionals and move through the proceedings of an actual trial. While the two simulations did not work as well as Law Mentor had hoped, she is piloting the use of the MOO environment in the 1996-1997 academic year.

MOO is a 'Multi-User Object-Oriented environment. MOO is networked, text-based virtual reality. It's sort of like reading a story, and writing it at the same time. MOO is a shared virtual space that you can enter via the Internet. Once 'inside' you can move around, converse and interact with other people who are logged in, and work with objects within the MOO environment. You interact with the MOO by reading and writing. You will find different rooms and spaces, objects and tools, and other people who are exploring the environment at the same time as you. By reading their descriptions and actions, you immerse yourself into the MOO, much in the same way you do when reading a novel (Guest 1, Law 12 Conference Archives, 1995 - 1996).

The MOO environment will probably be well suited for the mock trial simulation as Guest 1, graduate student at Simon Fraser University and developer of the Law 12 MOO, has created an entire virtual courtroom, complete with rooms, corridors, bench, etc. If learners are able to function in this virtual law environment, they may be able to begin to develop the skills required for membership in the legal community.

The ability to direct comments specifically to a learner is a further step in community membership. This is termed dynamic criteria, or just-in-time learning. Dynamic criteria is based on learner focused inquiry and requires that a more knowledgeable member of the community has the skills to respond to learner questions when they are relevant to the learner. This process is a step in the establishment of knowledge building and is the basis for substantive dialogue; dialogue that extends conversation in both a conceptual and knowledge building format. The use of the Legal Beagles touches on dynamic criteria, but for the substantive dialogue to develop, the learner must have direct access to the expert. Having Ron Rapin, a retired member of the Legal Services Society, monitoring the Law 12 conference was a rich experience for the learners. In one interaction, a facilitator asked a question as reference to a project she was doing.

Monday, January 15, 1996 8:30:43 AM
Law 12 Forum Item
From: Facilitator 3
Subject: Euthanasia and Living Wills
To: Law 12 Forum
Hey Legal Beagles:
Does anyone know if living wills are recognized in BC? These documents are written when a person is capable of making decisions for him/herself
and usually specify that the person does not wish to be kept clinically alive by technology alone should the circumstances arise and quality of life had diminished. The whole concept of euthanasia presents interesting legal and ethical implications (remember the Sue Rodriguez case?). Facilitator 3

Monday, January 15, 1996 9:37:00 AM  
Law 12 Forum Item  
From: Law Mentor  
Subject: Re: Euthanasia and Living Wills  
To: Law 12 Forum  
Thanks for your question, Facilitator 3. These kind of questions get us all thinking about legal topics which we might not have otherwise contemplated.

I am not an expert on wills, but I expect that any request in a will which is legal will be recognized in BC. As you will recall, Susan Rodriguez’s request to have her life terminated was not recognized because the Supreme Court of Canada did not recognize active euthanasia...

Here are a couple of examples of requests people have made regarding what should be done with their bodies after death--and what the courts decided.

Roy Rogers--a famous cowboy hero of kids in the fifties and still living--wants to be stuffed and mounted on his favorite horse Trigger, who is now in a museum. The courts decided that this is an illegal request.

A young woman who was married to a Texas oilman asked to be buried in her favorite sports car. A number of her relatives who did not agree with her life style, but who wanted to be the beneficiaries of the expensive sports car contested her will. The courts could find no reason that her request should not be granted--so the young woman and the car were put in the ground while her weeping relatives watched.

This doesn’t exactly answer your question, Facilitator 3, but it does give you an idea of what is acceptable and what isn’t. I believe the law is still being made in this area--as decisions are made. Can anyone else give us any more information?

Tuesday, January 16, 1996 10:00:28 PM  
Law 12 Forum Item  
From: Ron Rapin  
Subject: Re: Euthanasia and Living Wills Remember that the full name for a normal will is a  
To: Law 12 Forum  
Remember that the full name for a normal will is a ‘Last Will and Testament.’ The concept has been around for a long time and was originally part of Church Law. It was the priest, before most people could write, who normally heard a person’s dying wishes. Legal wills today still deal with a person’s wishes that are to be acted upon after their death. Many rules have been created to govern wills because there is no hope of going back to ask what was intended if something is not clear.

Living wills are not legal in the same sense. A court is not bound to follow as directly, the person’s wishes. On the other hand any evidence as to what a person’s desires are, will normally be followed when they do not conflict with reasonable practice. A living will cannot ask for an illegal action, such as someone actively causing one’s death. But then a legal will cannot do

Wednesday, January 17, 1996  2:08:33 PM
Law 12 Forum Item
From:   Law Mentor
Subject:  Thanks to the Legal Beagle
To:     Law 12 Forum

Thanks for your reply, Ron.--we really benefit by the professional responses here!

While these three messages were exchanged by adults in the conference, the same type of learner focused response could be developed within Law 12. Having the professionals directly involved in the conference speeds up the response time and allows the professional a clearer sense of the learners' skills and abilities. Therefore, they could situate the tasks and responses more accurately to the learners' needs.

A fourth criteria, expert process, could also be incorporated into the NDDL design. Expert process refers to connecting the necessary skills to actual practice within the legal community. It makes the connection between the conceptual knowledge and the factual knowledge, allowing the expert to guide the learner's experiences and model appropriate actions. Expert process could be modelled in a mock trial simulation or the experience of writing modified legal briefs, etc. The First Class conferencing environment would allow experts to mentor specific learners and guide them through modified legal tasks. The MOO environment could support modeling in the virtual mock trials. The potential for expert process exists within the Law 12 course. However, the assignments must be modified so learners need to use the resources available to them. One learner, Student 3, stated that she had not needed to use the Legal Beagles or the online reference materials because the assignments were simple to complete. If learners are to use the expert process technique, then the assignments must be challenging enough to warrant the effort. More assignments, like the one shown below, must be developed for more than Technology Challenge credit if learners are to use the resources.

Tuesday, January 9, 1996  4:00:18 PM
Law 12 Forum Item
From:   Law Mentor
Subject:  A Few Questions
To:     Law 12 Forum

What follows are a few questions I’d like you to think about before the audio conference. I purposely chose the case which I discuss in 'A Class Act' to get you thinking-- I am not looking for a specific answer--just evidence of good thinking.

Questions for Consideration:

1. Section 266 of the Criminal Code reads:
   A person commits assault when without the consent of another person,
he applies force intentionally to that person directly or indirectly.

Do you believe the police were correct in charging Mr. Howard with assault?

There are other questions included in this message. The learners were to prepare their responses and bring them to the audio conference. If this had been a fully developed community of practice, it would have been fascinating to have the legal professionals take the same questions and model their expert process in responding. As stated before, the Law 12 course has great potential for the development of a community of practice, using expert process and other criteria.

Criteria five, interaction among experts and learners, encourages an informal banter or exchange which allows the participants to get to know one another and establish more than just a question and answer relationship. This interaction would allow learners to see who some members of the legal profession are and determine a perspective as to what everyday life is like for these people. The audio conference on Legal Careers started this interaction, but it was not sustained with continuing e-mail or conferencing interaction. Learners were given advance information about the professionals participating in the audio conference so they could develop questions if they wished.

Thursday, March 7, 1996 9:32:06 PM
Law 12 Forum Item
From: Law Mentor
Subject: Assignments--March 14
To: Law 12 Forum
In order to get the most from the two special audioconference events which have been organized for you, I am asking that you do a little preparation.

For the audio conference Thursday, March 14, you already know that you should be at the conference site fifteen minutes before the session begins. You should have [paper and pen with you to take a few notes as you will have a bit of work to do after the audio conference sessions. ...

Professor Cohen [Dean of Law, University of Victoria] teaches in the areas of law and regulatory policy, commercial law and planning, contract law, and law and economics. He has written extensively in a range of areas including: contract theory ...
[biographic details follow]

Other biographies appeared online. There was one for a dog handler and his dog - complete with pictures. Assignments for after the audio conference were included. A second conference featured the Assistant Manager of Forensic, a Deputy Sheriff, and a Court Reporter. Participants in the conferences could ask questions, and the guests presented information about their personal lives, their training, and their actual work. While these guests were not available online, learners did discuss the conference after the event. However, having the guests online for a period of time after
the conference could have increased the potential for interaction and worked toward developing a greater sense of a community of practice. Connecting these guests' professions to the Law 12 curriculum would increase the connection between the conceptual knowledge and the factual knowledge; thereby, further developing higher order thinking skills.

Sustained interactions would also allow the experts to create a specific learning environment which would be relevant to the individual learners. The creation of this learning environment is criteria 6. While other criteria previously mentioned could be used to accomplish this, the modification of learning environments to match specific learner's skills is essential. If the NDDL instructional design of self-pace learning is to be supported, the experts cannot assume that all learners will be at the same level of membership in the community of practice. Learners must be supported and developed at whatever level they are, and the applications and tasks must be situated within the learner's skills. If the professionals were available online for a sustained period of time, a relationship could be established and the learner's tasks gradually increased.

A final criteria relevant to the Law 12 environment is the availability of reference materials. In the actual work of law, professionals are not expected to know everything off the top of their heads. The ability to do research and make a case based on background information, precedents, and some legal argument is critical. The online Law 12 environment is well suited to house these legal archives and to support hypertext searches. Learners enrolled in Law 12 also have access to the Internet, another source of material. Law Mentor has digitised the Legal Code of Canada, some background cases, and miscellaneous reference material and placed them in the Law 12 Resources Conference branch of the Law 12 conference. Law Mentor encourages the use of these materials via her Forum messages.

Tuesday, October 3, 1995 2:40:57 PM
Law 12 Forum Item
From: Law Mentor
Subject: Yahoo!
To: Law 12 Forum
I just noticed that OLA Staff 2 has put our Law Resources back. Good stuff! Check in there and download a few things--tell us on Law Forum what you have found. More credit for the technology challenge if you do!

Potential uses of the Law 12 Resources are limitless. These materials could support self-directed learning activities which could be negotiated by the learners. Modeling the use of the resources could assist learners develop their membership in the community of practice and show them the actual skills required by legal professionals.

Key Conclusions
The full development of a community of learners and specifically the development of a community of practice in the actual practice of Law 12 will require a shift from the present instructional model of Law 12 to the actual instructional design proposed in the NDDL stated intentions.

At present, Law 12 is structured too much on the traditional correspondence instructional design. Students are able to complete the course by simply working through the DES papers and passing the tests. Online social interaction is not evaluated in the marking scheme other than the Technology Challenge, which is an optional activity. Therefore it is seen by some students as not being essential for course completion. As one student stated, she did not want her hard work taken by the others. Therefore, she did not see any reward for sharing during social interaction. It would appear that shifting the marking / assessment scheme toward valuing social interaction and reducing the importance of the grades given on papers or tests could support a collaborative online environment. This is consistent with activity theory which suggests learners' needs should determine their activities. In NDDL, if students did not need to engage in social interaction to complete their assignments, it appears they defaulted to traditional DES practices (Figure 18).

During a telephone interview four months after the 1995 -1996 Law 12 course was over, Law Mentor agreed that the technology challenge was the only major difference between Law 12 from DES and Law 12 from NDDL. She recognised that revamping the Technology Challenge concept and reinforcing its place in the instructional design was essential if Law 12 was to move way from traditional DES practice and embrace the innovative practice proposed by the NDDL instructional design.

In order to encourage social interaction, and thus the knowledge-building associated with it, Law 12 will have to re-design itself around the criteria for the development of a community of practice. If this is not done, the marking scheme and the curriculum will continue to support the correspondence materials, and students can avoid interacting socially, missing all the promises of the NDDL model. The Law 12 Student Guide refers to role playing, reconstruction of learning, and cooperative group interaction while the actual practice of the Law 12 participants does not support those activities. If those intentions are to be fulfilled, social interaction via a community of practice must be developed.

The development of a community of practice could also address the concerns of asynchronous delivery of instruction. While the NDDL model supports this notion, each audio conference or mock trial encourages students to be at the same place at the same time. While Law Mentor did adjust the curriculum to include the modified Harvard Case Study method, she did have to make allowances for students who had
varying levels of knowledge and understanding about law, depending on where they were in the course. Law Mentor reduced the number of group activities in an attempt to support asynchronous learning, but she did not add any other activities to promote higher order thinking and knowledge-building. Expert practice, via dynamic criteria, interaction with legal professionals, and a modification of the student’s specific learning environment could support the higher order thinking and knowledge-building offered by a community of practice and maintain the asynchronous delivery of instruction.

The skills required to sustain a community of learners within Law 12 seem generalisable to the NDDL organisational structure. It appears that all the participants in the project must commit themselves to the four steps (p. 181) presented by McGrath (1990) and re-develop the teamwork required to meet the task of providing learners with an improved learning environment. As stated before, this will require professional development activities and continued support from the project team and all members of the learning traid to develop the present NDDL group of individuals into a collaborative group of learners in this virtual community.
SECION D - LEARNING OPPORTUNITIES IN CYBERSPACE

"Technology is neither good nor bad, nor is it neutral."

Introduction

The NDDL project faced numerous problems with the technology selected to support is instructional design. While many of the problems stemmed from the fact that it was a pilot project, five issues appear to have had the most impact:

1. The software applications had not been used previously in such a widely distributed learning environment,
2. Some of the technology consisted of recently developed beta versions of either software or hardware,
3. The level of technical support varied at each site while the project’s technical experts were available only online or on the telephone,
4. After the first year, critical success factors (Chapter Four) were not used to determine participants so the technical abilities varied among participants, and
5. The innovative instructional design piloted in the first year was not diffused adequately to the new members who joined in years two and three.

Along with the actual problems of software and hardware was the issue of equitable access. This problem seemed to grow in importance each year as the bandwidth gap widened between have and have not sites. In one situation learners in a small rural site, typical of those for whom the project was originally designed, became marginalised when they were asked not to participate in group audiographic conferences because their bandwidth slowed down the larger group’s performance. This was particularly sad as that site had been involved in the project since the beginning. The facilitator at that site noted that their initial reason for involvement in the program had been two fold: (1) increased course offerings and (2) the opportunity for learners to interact with others across the province (Research notes - E-mail communication, Spring 1996).

The NDDL Experience - Education Online

The NDDL instructional design is built around the use of technologies that can support innovative educational practice (Figure 16). By year three of the project, participants were required to communicate almost exclusively online. Other than the summer symposium and the occasional audio conference, communications, interactions, and the distribution of materials and information were done through the computer conference. For some participants, this was their first online experience.
(Facilitators 1 - 4; Mentors 2 - 8, E-mail Communications, Spring 1996). These participants were required to jump right into the virtual world and carry on their work, choosing what they wanted to share with others and a voice they would use to portray themselves online. Turkle (1995, p. 180 & 178), who has spent years at MIT attempting to sort out the sociology of the online world, suggests

The Internet has become a significant social laboratory for experimenting with the constructions and reconstruction of self that characterize postmodern life. In its virtual reality, we self-fashion and self-create. What kinds of personae do we make? What relation do these have to what we have traditionally thought of as the whole person? Are they experienced as an expanded self or as separate from the self? Do our real-life selves learn lessons from our virtual personae? Are these virtual personae fragments of a coherent real-life personality? How do they communicate with one another? Why are we doing this? Is this a shallow game, a giant waste of time? Is it an expression of an identity crisis of the sort we traditionally associate with adolescence? Or are we watching the slow emergence of a new, more multiple style of thinking about the mind?

What will computer-mediated communication do to our commitment to other people? Will it satisfy our needs for connection and social participation, or will it further undermine fragile relationships? What kind of responsibility and accountability will we assume for our virtual actions?

This research touches on a few of Turkle’s questions. Student 3, the honours student enrolled in Law 12, explains that she found the virtual environment to be guilt-free. She allowed herself to shape a different personae online “... because I didn’t know the instructor or the other classmates so it didn’t seem real or serious” (Student 3, July 1996). This other personae made up survey results and invented scenarios. While she had never considered cheating in this manner in traditional school, the online environment felt deceitful and false to her, so she acted accordingly. Whether other students may have acted in the same manner is not known as this issue came up in an interview after the academic year was over, I was not able to confirm it with other learners.

Many learners state that they do not portray themselves realistically online. At one NDDL site, the facilitator reported watching two adult learners (30 and 45 years old) present themselves as teenagers on the Chat line and try to pick up guys (Facilitator 3, E-mail Communications, Spring 1996). To these two women it seemed like harmless fun and a delightful challenge, but what effect does this type of activity have on relationships among participants? Throughout the literature (Cicourel, 1990; Galegher & Kraut, 1990a; Walls, 1994), trust and respect are reported to be major components of community building. A question arises as to how to trust individuals in
the virtual environment when they may choose to present themselves falsely? Turkle (1995, p. 228) notes

Life on the screen makes it very easy to present oneself as other than one is in real life. And although some people think that representing oneself other than one is always a deception, many people turn to online life with the intention of playing it in precisely this way. ... For what can we hold ourselves and other accountable?

This question of whether our real-life selves learn from our online personalities is especially interesting. At one NDDL site, a facilitator noted that one of her learners with cerebral palsy questioned whether or not he needed to tell his fellow online learners about his physical condition. The facilitator affirmed that the decision was his to make, and the site supported his choice by not "blowing" his cover in their messages. After a month of correspondence with his new virtual body, the learner went online and stated his true condition. He explained, "That's who I am. It's easier to be myself" (Facilitator 7, Research Notes, Fall 1995). An interesting irony is that the person to whom this learner shared the truth had a family member with the same condition and the interactions continued but in a richer way.

The issue as to whether participation online is a shallow game, a giant waste of time, is up to the individual participants to determine. It appears that if there is reason to interact online in an open and honest manner, then the process will have value. This is consistent with activity theory suggested in Chapter Two (Section A).

NDDL set out to afford learners an environment consistent with the current research on computer conferencing. In many ways, it accomplished that goal. For learners in remote, rural locations, NDDL courses offer the only opportunity to participate in Law, Calculus, Physics, Writing, etc. and interact with a mentor and classmates.

Technical Issues

Discussion of cyberspace and issues of technology and society are intellectually stimulating and theoretically challenging, but there is a technical side to online activity which consists of electronic devices, software applications, and lengths of cable and cords - all with the potential to fail.

The potential exists for learners to be literally all hooked up to a program, but virtually having no place to go. One wrong phone connector, power failure, loose cable and the system is down. Quite often facilitators and mentors were the individuals on-site who were responsible for ensuring that the technology was working properly as
support people might be located at distant school board offices or available only online or on the telephone.

Over the three years of this research, I have observed or experienced technical problems ranging from server issues to software support. In the case of servers, different configurations have been tried; each being a modification of the previous design. During the first two years of the program, the project team was aware of each sites' needs, and high levels of support were given. Inservice training in the use of the various technologies (Figure 16) was offered during the yearly summer symposiums. However, problems continued as should be expected in a program reliant so heavily on technology. The long term effect these problems had on participants is hard to calculate, but varying levels of frustration were reported from all triad members during all stages of the project.

NDDL technical problems can be separated into three aspects: (1) server connections, (2) software issues, and (3) operational procedures. Each is both site specific and generic. Site specificity refers to the effect the constraint had on both human and technical resources. Generic refers to the effect the problem has on the total project and its participants. For example, it became a generic problem when Law Mentor, the Law instructor, was unable to connect to the NDDL server, it effected not only her specific site and her ability to do business but learners at various sites who could not contact her.

Server Connections

In the first year of operation, 1993 - 1994, the NDDL project worked from a central network with a distributed hub. The main server was located at Fort St. John, in northern British Columbia, and a central hub was located in Kelowna. Sites connected either to the main server or the central hub, depending on their locations. Connections were made using an 800 telephone number which directed the cost of the call to the NDDL project. While this system worked adequately for the first year, the line speeds were too slow to support complex audiographic conferencing, and the cost to the program was exorbitant.

At a site level, the server solution for the first year was relatively easy. Sites needed two phone lines - one for audio conferences and one for audiographic conferences. Facilitators needed only to do three basic technical tasks (1) use the client tool for the conference software; (2) establish a modem link with the server or the mentor, and (3) hook up the PolyCom conference telephone (Project Handbook, 1993 - 1994). While the bandwidth on the telephone lines was a problem, the server technology and client tools were not. Therefore, the project team decided to change the server solution.
For the second year the project team decided to place servers at each NDDL site and have these distributed servers auto dial the main servers after midnight when the toll rates were low and the line traffic minimal (Project Team 3, Interview, Spring 1994). This procedure was only for the transfer of data; learners participated in audiographic conferences during traditional school hours. The servers had been configured by technical personnel at Fort St. John, location of the main server, and sent to the schools.

Site-based personnel were expected to trouble shoot the servers and contact the appropriate technicians when problems arose. Problems with the data transfers happened often as the servers frequently could not connect. Facilitators reported that they would come to their sites and discover error messages indicating connections had not been made or data had been transferred incompletely. This required manually connecting the servers during prime rate time so technical staff could monitor the data transfer and mediate problems. This was not a robust solution; some sites reported phone bills of over $500 per month, for which they had no budget (Facilitators 3, 4, 6, 7, Interviews, Summer Symposium 1995).

Because the data transfers often were not completed, learners and mentors did not have each other’s information. Audio conference and audiographic conferences were difficult because material had not been marked or messages not received. The server problems translated into frustration and confusion. Mentors could not determine if students were really having technical problems or convenient technical excuses. Because of these issues, site-based servers were dropped in the third year.

In year three the project team attempted to simplify the procedure by locating a main NDDL server at the Open Learning Agency in Burnaby, a suburb of Vancouver. Sites were required to have stable router connections. It was assumed that each site would be able to function at 28,800 baud, at least, which could support the Apple Media Conferencing tool. Facilitators were given inservice training in the use of Apple Media Conferencing and a client tool for the First Class computer conferencing software.

Both pieces of conferencing software worked well and were basically user friendly. However, router connections were not stable or consistent throughout the NDDL sites. BC Tel, the provincial telephone company, owns the telephone lines and controls the upgrading schedules for the roll out of fibre optic cable and digital switching. Because their schedule is based on population demographics and corporate profit, have and have not sites, in terms of line speed, access, and line stability, appeared in the project.

Although a router connection was a site requirement for participation in year three, a few sites were allowed to participate using dial up access. Student 3’s site was one of those locations. The local DES was responsible for connecting the router at her
site, but a variety of reasons (technical expertise, technician time, and other priorities) delayed the installation. Therefore Student 3's site used a standard modem connection. For students like Student 3, this added another step to the connection process; the students had to track down their facilitators and have them make the connection. At these sites, facilitators controlled the access to these connections through passwords. This was a requirement from the various DES in an attempt to control the costs associated with dial up access. The result was limited online participation and reduced time available for exploration of the conferencing system. As Student 3 reported in previous sections of this chapter, her online activity was purposeful and directly grade-related (DES 1, Student 3, Facilitator 5, Interviews, Spring 1996).

Of all the mentors in NDDL, Law Mentor had some of the greatest problems connecting to the NDDL server. This was mainly due to her location in the interior of British Columbia at Williams Lake and the poor telecommunications connectivity. It was also due to the fact that her family shared her work computer. Law Mentor reported that her DES principal solved one of the problems by loaning her a computer, and the project team worked on the connectivity issue by installing a ProvNet line, a dedicated, high speed phone line. When interviewed online (January 8, 1996), Law Mentor replied by apologising for the delay in her response. "When I've been working I'm getting bumped off the line and getting busy signals when I try to go back in ...which is the answer to one of your questions" (Law Mentor, E-mail Communications, Winter 1996). Ironically, the question she had been delayed in answering concerned problems with her connectivity.

In the third year, Law Mentor was unable to connect to the conference from September 1st until October 2. This may have affected getting the course off to a strong start. While students could log on to the conference, and they could start their correspondence papers without Law Mentor, the course was in a "virtual" limbo. Even though a member of the project team kept people informed as to what was happening with Law Mentor's access and computer, participants were concerned about Law Mentor's absence from the online conference. The long term effect that these absences had on students was probably a large variable in student success.

Law Mentor's connectivity problems continued throughout the year.

Thursday, January 11, 1996 7:56:45 PM
Law 12 Forum Item
From: Law Mentor
Subject: Audioconferences
To: Staff Room
Law 12 Forum
Writing 12 Forum
English 12 Forum

I have been having some trouble getting into First Class these days, so the Admin at the Help Desk kindly sent the memo in for me re: English 12 Audio's postponement.
Law 12 is still on for Wednesday, Jan. 17

The project team filled in whenever possible. However, some students really had trouble coping with the disruptions caused by technical problems.

Most facilitators at the NDDL symposium (summer 1996) stated that a poor start at the beginning of the academic year severely affected student involvement and attitude. All facilitators expressed the need for NDDL to start course work in the first week of the new school year to establish positive momentum. They stated that having the students sitting around waiting for course materials set a poor tone for the year. However, in each of the three years, something affected the opening plans, and courses were delayed due to hiring instructors, distributing materials, or solving connectivity issues (Facilitator Discussions, Research Notes, July 1996).

A facilitator from one of the original NDDL sites reported that

... since I was unable to attend the summer conference [symposium] and the NDDL sign up sheet had somehow vanished, we faced the problem of starting the whole set up from scratch. Although we had most of the hardware, the Internet connections had to be arranged and installed. ... by November OLA Staff 2 [NDDL technician] could visit us and establish the necessary connections.

Otherwise, things run smoothly. ...knock on wood (Facilitator 4, E-mail Communication, Spring 1996).

The November start Facilitator 4 describes hindered progress at his site, and then caused a surge of marking for mentors when the students did connect. It also put a strain on the operational procedures as mentors had prepared for assignments to be arriving via First Class. The site mentioned above "... circumvented the [technical] difficulties by using either ... fax lines or just postponed [ing] sending work out until the lines were working again (Facilitator 4, E-mail Communication, Spring 1996).

Facilitator 4 added

Originally the district was to have our equipment installed for September 1995, so that I would be able to use First Class, Apple Media, etc. prior to the students enrolling in their course. This was not done. As it turned out, we would not receive our Apple computer until February, some two weeks AFTER the students began their Calculus. ... The computer did not come with enough memory to run Netscape or Apple Media, etc. so a RAM expansion kit was placed on back order. ... This is not arrive until March 19... . Since then things have run smoothly. (NDDL Conference Archives, 1995 -1996).

Facilitator 4 explained that they lost their TCP connection twice, which affected one audiographic conference. However, the willingness of the facilitator to continue participation in the project and to assist his students by whatever means necessary is to
be applauded. It demonstrates how strong the need is to provide alternative course delivery to sites across the province. The potential for the NDDL model is recognised and supported by the triad members, regardless of the technical challenges.

Another site, which had been involved for all three pilot years, observed that different types of students coped differently to the course delays and general technical problems. The highly successful students needed the teacher's direction and became frustrated and agitated when anything in the NDDL design went wrong. If the server was down, they would quit all work for the day, not attempting anything out of sequence or un-directed. The less successful students seem to expect less from their instructors and would quite often find something else to work on (Facilitator 3, E-mail Communications, Spring 1996).

Another facilitator / mentor adds to that observation

... I also think that the students who take NDDL, with the exception of those who take it because they are in remote areas and don't have a teacher for a particular class, are often mobile, loners (often home schoolers) and as one chatty ... girl blurted out in the Law Forum, 'Here at ... we are either pregnant, drug addicts, drunks, or a person trying to change a messed up life style.' ... [One DES employee told me] ... home schoolers are often kids who can't handle the peer pressure in high school. He tries to encourage them to at least go to the high school for a couple of courses with a view to making a couple of special friends. He said a lot of these kids are fragile and give up very easily. He is talking about Distance Ed. in general, but I am sure we get some of those [in NDDL] (Mentor / Facilitator 5, E-mail Communications, Spring 1996).

While some students seem attracted to NDDL by the lure of the high tech learning environment, some seemed threatened, almost intimidated by it. Facilitators had the complex task of sorting out these extremes and assisting the students to make sense of the virtual environment.

Facilitator 3 observes

It seems to me that the high end students have difficulty adjusting to the NDDL scenario. Perhaps they are less likely in the regular classroom to interact with the instructor for assistance and this just transfers into the NDDL arena. In order for them to be happier in this environment, the instructors need to be more reliable in their communications with the students. Putting the onus on the students to initiate interaction is less likely to lead to success. Another of my quite personal observations is that the courses which are more structured, assignments and conference-wise seem to work better. The structure can allow for independent, self-paced learning; however, the students like to know exactly what the expectations
are and how to work through the assignments. I don’t think this conflicts
with the NDDL philosophy and is an area which may need some
improvement (Facilitator 3, E-mail Communications, Fall 1995).

Further research should be devoted to student types and their adaptations to
innovations in delivery.

On January 24, 1996, days before the start of the second semester, the mentors
held an audio conference. This was the mid-point in the academic year. All mentors
reported that technical problems were still affecting their courses (due either to
connectivity issues or procedural problems). All mentors expressed concern about the
technical abilities of the site-based facilitators in terms of them assisting students. At
that audio conference there was a general consensus that facilitators needed additional
training, and that the project team needed to slow down the introduction of new
technology into the instructional design (Research Notes, Winter 1996).

Summary of Server Connection Issues

A stable connection and adequate bandwidth are critical for online
communications. The stable connection requires acquisition of robust technology
(routers, modems, computers) and a basic understanding in order to trouble shoot
problems at sites. Bandwidth is a thornier issue. Currently in British Columbia,
bandwidth is controlled by the telephone company (BC Tel) which is regulated by the
CRTC (federal regulatory agency for radio and telecommunications). There is nothing
sites or communities can do to increase their bandwidth unless BC Tel decides to
upgrade local service. This single issue has had an enormous affect on equitable access
to the Internet for rural residents of British Columbia.

Software Issues

Over the three years of the project, participants were required to learn to use a
variety of new software programs and hardware tools. While sites recognised that this
was part of participating in a pilot project, especially when working with leading edge
technologies, many participants felt the time had come during the third year to focus on
the instructional design and slow down the introduction of new tools (Facilitators 1 - 7,
E-mail Interviews - Spring 1996). Sites reported two main concerns with software
changes: costs and increased demand on limited bandwidth and RAM (computer
memory). It is interesting to note that no facilitator interviewed for this research
complained about learning to use the new tools. Most expressed pleasure
experimenting with the technology and a willingness to learn. Some state the exposure
to new technology was a side benefit of participation in the program.
At one point in year two, it seemed that Spender's (1995, p. 134) "... hot-rod computer mentality ..." of more bytes, larger hard drives, and new technology was directing the project design. When the use of video conferencing was discussed, a few of the original NDDL sites panicked. These remote sites already were having trouble with bandwidth for audio conferencing, and they feared that the increased bandwidth demands of video conferencing would exclude them from the project. The project team listened, and video conferencing was placed on hold.

In order to participate in the NDDL courses and budget for the costs, many sites had to retrofit existing computers. The hardware demands of the conferencing software (Apple Media and Timbuktu) pushed some of these old machines to the limit. One facilitator reports

After NDDL training, Apple Media Conferencing (AMC) and Timbuktu (TB2) were successfully and easily installed on the appropriate work stations in the NDDL room. No problems were encountered, and Mentor 1 [also a project team member] and I successfully ran a test of both products. Even the 8Mb of RAM on the old LC 475 seemed to be OK. As the year got under way, however, it became obvious to the Intro. Math instructor ... the 8 Mb of RAM was a limitation and lessons were modified to suit the configuration of the machine (Facilitator 4, E-mail Communications, Spring 1996).

Fortunately, RAM prices dropped dramatically in the spring and many sites were able to upgrade their equipment. However, bandwidth continued to be a major concern. It was reported that "CD-ROM sessions were not successful as the bandwidth and the RAM on the Macs were not great enough ..." to support it (Facilitator 4, E-mail Communications, Spring 1996).

Some sites experienced problems sustaining audiographic conferences with more than one site.

On at least two occasions this spring, audiographics sessions were stopped because the transmission time for one AMC image became too great. Mentor 7 and the students coped with this well, but were disappointed that they were not able to take full advantage of the technology (Facilitator 6, E-mail Communications, Spring 1996).

That facilitator pointed out that the bandwidth problem is "... the most significant problem to be solved for future NDDL classes that make use of audiographics technologies" (Facilitator 6, E-mail Communications, Spring 1996).

The project team dealt with most of the software related problems by setting standards in terms of which program version was acceptable, and by making sure that software choices were available for both the Macintosh and IBM platforms.
Incompatible software versions did cause problems. For example, Claris Works was the integrated package chosen for word processing in all NDDL courses and for advanced applications in Data Processing 11 and 12. However, when the corporation issued version 3 for MAC before it issued version 3 for Windows, files became incompatible between platforms. Eventually, these issues were addressed, and the project team is aware that it will always have to be vigilant to assure all participants are using the same software and that the vendors are able to supply the proper versions.

This was the situation in the case of the Visioneer Paper Port. The Paper Port is used to scan text and graphics documents into data files which can be compressed and sent cross platform. Unfortunately, the company had problems with its software. Later, as more sites needed to purchase Paper Ports, a newer version of the software was included. Therefore, upgrades had to be distributed and installed.

The Paper Port also placed a demand on RAM. If students "... left large files on the Paper Port desktop ... there was not enough RAM to successfully launch the application" (Facilitator 6, E-mail Communications, Spring 1996). Students had to be trained to keep the shared desktop clean and establish protocols for sharing common virtual work spaces.

Some sites reported student tampering with software settings, especially with the Paper Port (Facilitators 2, 4 - 6, E-mail Communications, Spring 1996). Site base trouble shooting or Timbuktu sessions with NDDL technicians were required to remedy these situations. Those sites with Apple Talk networks experienced difficulties with their Paper Ports as Apple Talk conflicts with Visioneer settings. While solutions to these problems are in the Visioneer documentation, sites reported that they turned to NDDL technicians for support as there was limited time for facilitators to explore the new equipment, attempt trial and error troubleshooting procedures, and assist students.

The choice of First Class conferencing software was made based on its features (e-mail and conferences), the fact that it supported both the Windows and Macintosh platforms, and its cost, which is quite reasonable. While sites reported no problems using the client tools required to connect to the main server, there were some problems concerning appropriate e-mail communications and conference participation. Mentors in the NDDL program could integrate computer conferencing into their instructional design as they thought appropriate. For example one course required online participation (Communications 11) while another used it only as a mediation tool for student assistance (Information Technology 11).

While First Class is a full featured conferencing package, there are some potential limitations to interaction. The fact that messages appear in the Forum areas by chronological date rather than subject means that messages often jump from topic to topic, depending on when they were sent. Students report that they often felt that they had joined in the middle of a conversation so they only read the messages and did not
contribute anything new. An instance of this happened in March when Law Mentor and a few students were discussing a current events question that Law Mentor had posted. OLA Staff 3 joined the conference and connected her message to the previous messages, inviting participants to join the audio conference on legal careers. Comments from the students followed, discussing the audio conference and then discussing the upcoming mock trial. Into the middle of this discussion came a series of messages from one student, submitting answers to Law Mentor’s questions which had been posted months earlier. By the time the five messages had been posted from this student and Law Mentor had responded, the previous discussion was finished. Law Mentor tried to re-start it, but the online interaction dwindled for almost a month (Personal observations).

Pro-active moderation, using the weaving techniques suggested by Mason (1991) and Feenberg (1995), and message grouping by topic might encourage sustained interaction and develop the attributes of the NDDL instructional model described in the Project Handbooks. Content groups could be created by the mentors as they have the ability to create conferences within conferences. These groups might then encourage conversations about specific issues and limit the interruptions caused by topic shifts. This was done in the Communications 11 course. Conference participation was mandatory, and an area was established where these messages were placed. The mentor of the course functioned as a conference moderator encouraging the students and connecting the messages as they appeared.

The degree to which individual mentors attempt to encourage online social interaction is a variable in the NDDL instructional model. While Law Mentor encouraged participation, she did not function in a moderator’s role (Crichton, 1993; Mason, 1991; Riel and Levin, 1990). This is an area that should be developed for professional development for mentors.

Problems with some features of the First Class Client Tool for Windows were reported. One facilitator wrote

On the Windows side, we found that the First Client Version 2.6 was NOT acceptable for downloading file attachments. The solution for this was to have all students in NDDL use the MAC for that purpose. Rob and OLA Staff 2 [NDDL technicians] tried to help, but the problem really seemed to be with the software itself (Facilitator 6, E-mail Communications, Spring 1996).

At various times data files seemed to get lost or damaged within the First Class environment.

Monday, January 15, 1996 12:53:40 PM
Law 12 Forum Item
From: Student 13
Subject:
To: Law 12 Forum
Can you tell me the questions for the “Bench Brawl.” I can’t seem to find them. Thankx

Law Mentor replied via private message after uploading the questions again. At the beginning of the year, some files could be only partially opened, but the project team quickly restored the.

Monday, October 2, 1996 6:56:14 PM
Law 12 Forum Item
From: Law Mentor
Subject: Technical Problems
To: Law 12 Forum
Hello all! I just noticed that when I click on Law Forum, I get only half the messages, if I click again, I get the other half, but they don’t appear with the first half. IS this happening to anyone else?

Monday, October 3, 1996 2:40:57 PM
Law 12 Forum Item
From: Law Mentor
Subject: Yahoo!
To: Law 12 Forum
I just noticed that OLA Staff 2 has put our Law Resources back. Good stuff! Check in there and download a few things--tell us on Law Forum what you have found. More credit for the technology challenge if you do! I will tell you more about that in our first audio conference.

In the process of analysing the data for this research, the actual completion rates for students in Law 12 became public. Law Mentor had submitted marks for each student, posting them to the project team and the specific DES where the students were enrolled. As Law Mentor had dealt with individual students, often tracking their asynchronous progress through her course, she had not developed a big picture of Law 12 completion. Some students had completed the course within two months of starting it while others worked on it all year. When it was suggested to her that the success rates were quite low, she was, at first, quite surprised. However, as the issue was discussed, it became apparent that because Law Mentor had created individual spreadsheet files for students at each site, she had not developed a class list. Unless there was more than one student at each site, Law Mentor saw tabulated grades for only one student at a time.

All too often I forget the year before—not the individuals, but the group... . My groupings are actually by site so if I have a lot of students at one site I see a big picture for that site. The reports I send are individual. If I mix them as one class, I forget facilitators, timetables for a particular class, etc. (Law Mentor, Online Interview, November 8, 1996).

The problem of student assessment belies more than the issue of spreadsheets and mark books. It focuses concern back on the issue of knowledge-building and responsibility. Members of the learning triad did not have
• control over assessment strategies,
• control over curriculum content and sequencing, or
• a clear understanding of whose responsibility it was to develop learning plans and assist student to meet their time lines for course completion.
It also suggests that the time allocated for teacher contact may not be adequate for online instructions.

It seems with computerised mark books, etc. there is the potential to view only a screen-worth of information at a time. Few people have full page monitors, and even then it is not the same as a desk-full of paper all spread out. This screenshot view limits the viewer to the particular file, focusing attention on a detail rather than the total picture. Stoll (1995, p. 78) touches on this phenomena “Computers hide mistakes in logic while sanctifying information with an aura of truth,” suggesting things look good so it is assumed they are correct. He cautions, “Style shouldn’t overshadow content.
(p. 79).

The issue of reporting student progress is complex. As with any innovation, traditional practice often limits change. The use of a spreadsheet as a marking tool is tempting, and the creation of a standard template appealing. However, these tools are not yet a replacement for the standard mark book. The challenge seems to be to bring the valuable concepts and applications of traditional practice to the innovative practice and then develop the appropriate tool for the job.

In the Fall of 1996, mentors engaged in a discussion concerning the presentation of student grades to DES sites. The project team offered a database template as a standard format for each student. However, this still does not provide a solution for missing the bigger picture of total course progress (Research Notes, Summer Symposium, July 1996).

Law Mentor’s spreadsheet presentation of marks was used by the project team as a good example of reporting student grades to facilitators at various sites. In actual practice, this good example appears to have limited Law Mentor’s perception, affecting her understanding of the larger group’s performance. Style, in this case, had actually overshadowed purpose. The issues of assessment and accountability has not been resolved in the NDDL instructional design at the time of this writing.

In general, most facilitators acknowledged the tremendous support they received from the NDDL project team’s technicians. One facilitator stated “My enthusiasm for the project would be much less were it not for the those people [technicians] always willing to talk through a problem with and offering their ideas in how a problem may be solved” (Facilitator 4, E-mail Communications, Spring 1996). The NDDL project is leading the way, pioneering the use of new technologies in educational applications. Without technical support, the instructional model would not have worked. The impact
of the technology on the program is significant and a key component in either
supporting or limiting student success.

Law Mentor took a pro-active role in encouraging the students to overcome the
technical problems. Through both private e-mail and Forum messages, she supported
the students and offered suggestions.

Tuesday, February 20, 1996 10:17:00 PM
Law 12 Forum Item
From: Law Mentor
Subject: Gotchya!
To: Law 12 Forum
Cc: Staff room

... I believe that I have sent messages to all those who sent files I couldn’t
open. Please check with your facilitators for help in sending them in the
right form. Now that we are well into Semester 2, it’s especially important
not to let technical glitches keep you from getting those assignments in and
evaluated. We have just a little over three months to go to finish the course.

Summary of Software Issues

The professional development offered to teachers in NDDL must be reviewed.
The ability to effectively use the technology is crucial to the instructional design. The
project team must develop a clearer sense of effective online teaching strategies to match
the potential afforded by the technology. Otherwise, NDDL will simply continue to
support traditional DES practices and not achieve the innovative practice it set out to
promote.

Operational Procedures

Enrolling students, submitting papers, communicating with the project team,
and interacting with triad members are tied to the use of technology. In the initial year
of the project, all project team members could be contacted via toll free telephone
numbers. By year three, contact had to be made via First Class conferencing or e-mail.
This put pressure on users to understand the tools and be able to use them effectively.

Participation in audiographic conferences required understanding not only Apple
Media software, but also the telecommunication protocols required to connect via IP
addresses. During conferences, users were often required to either upload or download
files as well as use digitising tablets or mice for online interactions. These skills had
been demonstrated during the summer symposiums, but actual practice in a variety of
applications was developed during actual practice at each site. A few live training
sessions were held by NDDL technical staff, but facilitators and mentors expressed that
learning in actual practice taught them the most efficient ways of coping with the technical issues at their sites.

Sites wrestled with the distribution of online assignments and resources, and the exchange of assignments and tests for marking. The Paper Port was used for these transfers, but protocols for tiling assignments (linking all the pages of an assignment into one data file) had to be refined. Mentors reported that they were overwhelmed on occasion when individual data files containing separate pages of assignments arrived, without proper labelling and without being connected to the appropriate correspondence paper.

Law Mentor explained the procedure she wanted used for Law 12.

Wednesday, October 18, 1995 4:24:19 PM
Law 12 Forum Item
From: Law Mentor
Subject: Re: Law Mentor: Assignments
To: Law 12 Forum
All kinds of good questions in the messages you have sent today. If you type your answers in Claris Works, simply type the question, the number of marks it’s out of, and your answer. If your facilitator has downloaded the assignments or is using a paper port, you can simply type the answers in--the questions will already be there for you. Save them into a file, that you have named with something that is easy to recognize as the correct file, such as TG, Law, 1/1, Oct. 18. This will let both of us know whose assignment it is by the title, whether it’s a new assignment or one you did a long time ago, etc.

Save the assignment to a folder--maybe one called Tammy--Law--or something like that. One of the first pages of the assignment, don’t forget to fill in the box that asks for the % on your self-marking activities.

Next, send me an e-mail message and go to ‘file.’ Select ‘attach file’ and you will be asked to choose where you want to go to get that file. Choose the folder named ‘Tammy--Law.’ Then select the assignment you want to send to me by choosing ‘save.’ You will see something that looks like a horizontal thermometer showing you how much is left to copy. When it is done, simply select, ‘send’ as you did when you sent your message here to Law Forum. Make sure you send your assignments directly to me, not to the Law Forum. We share ideas here in the forum, but not assignments! :)

Generally, the software worked well, allowing sites to exchange files.

However, technical problems arose from time to time.

Monday, October 30, 1995 7:26:02 PM
Law 12 Forum Item
From: Student 12
Subject: Re: Calling All Beagles
To: Law 12 Forum
... I will start sending in my work as soon as this computer starts to work properly with downloading and stuff.

Monday, October 30, 1995 7:36:46 PM
Law 12 Forum Item
From: Student 12
Re(3): Calling All Beagles

Subject: Re(3): Calling All Beagles
To: Law 12 Forum
I'm working on the problem with the principal and the computer guy at school. Thanks for the advice. I'll try it out over here. Am I getting behind in my work? I hope I can get this all figured out soon.

Law Mentor continued to advise students as to how to send files. Often it was not the technology causing the problems but a lack of understanding at the site level.

Wednesday, November 8, 1995 2:36:11 PM
Law 12 Forum Item
From: Law Mentor
Subject: Assignments
To: Law 12 Forum
Here's a quick reminder for all my students--and I expect the other NDDDL mentors would appreciate this as well:
When you are sending in assignments as attached files, please name them something that makes them easy to identify.

For example if I were sending a law assignment in and it was Unit 1 Section 2, I would label the file something like SH 1/2 Law-N/8

I have a lot of students and lots of assignment to keep track of and this kind of label helps a lot when I am trying to locate a particular file for you.

The second thing I request is that you include specific information in the assignment which indicates which question or which particular assignment you are responding to, as well as the number of marks that each question or assignment is out of.

Send the assignments in as a unit, rather than as one or two segments of a lesson at a time. If you send me only part of a lesson, I have to wait until the other part comes in--and I have to try to match the first with the second by searching through files. If I have the whole unit, I can record it in my mark book and send your work back to you as soon as I have evaluated it.

If you are using the Paper Port, don't send each page as a separate file or I will be hours just trying to paste your assignment back together.

If you are not yet able to attach files to e-mail messages at your site, make sure that you send only the lesson to me, not the entire lesson book! The extra work and money involved in sending work this way is outrageous. Simply photocopy the pages, write your work and send them in the mail by section until you can use e-mail, if you don't want to take your work book apart.

The method of ensuring test security arose as students placed their test papers online for the mentors to mark. Once those files were online, they could be down loaded by other students. As assignments could be electronically sent to more than one location, DES personnel were concerned that the test bank could quickly be distributed throughout the NDDL network. This problem was quickly addressed by the facilitators who stated that only they would upload tests and send them to mentors, thereby prohibiting wide scale distribution. The issues of hackers in the system has only just
come up in the online correspondence during year four. How this will be resolved is yet to be determined.

Students also struggled with the new technologies. After 11 or 12 years of traditional education, many 17 - 19 year old students were reluctant to trust the new methods, preferring to do things the old way. One site reported that one student did not want to Paper Port his first assignment as he preferred to take it to the mailbox and send it. The facilitator had to convince him that the Paper Port was not only faster but more reliable as he was still able to keep possession of the original (Facilitator 3, Interview, Fall 1995).

Participating in the online conferences required new skills for most students. Some expressed initial frustration in conveying their thoughts in text only. They found it limiting as they wrestled with smaller written vocabularies and concerns about spelling and grammar. Because any Forum contribution was open to all participants, students were concerned that their writing looked correct for their mentors and facilitators. As Student 3 stated, "I wrote very carefully for Law Mentor, trying to write what I thought Law Mentor wanted to read. Just like a test response, you know. I was trying to figure out exactly what was required" (Student 3, Interview, July 1, 1996). Student 3 was at a site with other students enrolled in NDDL courses. When asked how she thought those other students did in their courses, she stated "... I can't imagine they did very well. You have to have good reading and writing skills to work online. After all, it's only reading and writing."

Many students got involved with online writing through the Private Chat option. While this still required written communication, it was real time, meaning that participants shared a split screen and could see the responses as they typed. This was much more like talking as speed was more important than accuracy - errors part of the style. Unfortunately, the use of the Private Chat option consumed vast amounts of online time, as well as time that students could have been working on assignments. Some sites turned off the Private Chat option. In the 1996 -1977 academic year, no student was allowed to use Private Chat.

One student stated "I write most of my messages via Forum, private e-mail with my mentors and people online. I do this because we no longer have private chat at our site" (Student 4, E-mail Communications, Spring 1996). Some students adapted to the online environment and were able to select the appropriate software option for communications. While Private Chat was abused for informal socialising by some users, it is a powerful communications tool. It affords the ability of real time chat while in the conferencing mode. Academic uses of this option should be considered in future course design.

Many students sent messages in the CAFE, an informal online conference for chatting and socialising. While mentors, facilitator and project team members
frequented the CAFE, it is principally for student interaction. There were occasions of abusive language or controversial topics, but moderators contacted either the students or the facilitators directly and dealt with the situations.

There was one instance of an inappropriate discussion in the Law 12 Forum. Two students exchanged messages, joking about being high (under the influence of drugs). "I'm not high hehehe" (Student 5, Online Conference Message, Fall 1995). Law Mentor, within the hour, had read the messages and responded "...please see my private e-mail to you re: "Forum Decorum."" There were no further messages of this sort in the Forum.

Summary of Issues Concerning Operational Procedures

Sorting out the operational procedures is central to supporting the instructional design. This issue is central to the organisation of the NDDL project and the ability of participants to interact.

Key Conclusions (Section D)

In the first year, participants appeared to be more adept at coping with the technical challenges. This was probably due to the fact that they had been specifically selected for the program, and technical skills were part of the selection process.

Participants who joined the project later varied dramatically in terms of technical expertise. Therefore, it appears that a greater emphasis must be placed on professional development, offering rigorous training for participants. The instructional design is too dependent on technology to trust that a few hours of inservice during a summer symposium will suffice. Traditional experience with teacher inservice suggests that ongoing support is required if changes presented in workshops or symposia are to be incorporated into actual practice. Learning experiences rather than training sessions are essential to ensure that innovative uses of technology within the NDDL instructional design are developed and maintained.

Emphasis must also be placed on the actual teaching skills required, not only for knowledge-building through reformed educational practice but for teaching online. If this does not happen, educators will end up integrating the new technology into old teaching practice, never realising its potential to assist in the reforming of educational practice. Educators must be given the opportunity to learn to use the new tools in a supportive culture of learning.

With time, programs such as NDDL will "work out" the virtual bugs in the technology that is used, affording participants ubiquitous interaction with the technology. When this happens, the task can take precedence to the tools, and
participants can concentrate on learning rather than troubleshooting. Then virtual learning environments can become the "great good places" that anthropologists like Ray Oldenberg write about. Places "... where members of a community can gather for the pleasure of easy company, conversation, and a sense of belonging" (Turkle, 1995, p. 232).

In 1973 E.F. Schumacher observed three critical elements that must be present for technology to be effective. It must be

- cheap enough so everyone can participate,
- suitable enough for small-scale applications, and
- compatible with people's needs for creativity.

Project such as NDDL are piloting the uses of innovative technology. The costs will probably go down, and eventually the equipment will become robust enough to be suitable for small-scale applications that cannot support the infrastructure costs of full-time technicians. The ability of people to incorporate the technology into instructional designs that support knowledge-building will be key to supporting human creativity.
One step forward, two steps back or so the saying goes. The actual practice of NDDL could be viewed either way:

- a bold step forward to innovative practice, encouraging knowledge-building and exploring the potential of online learning environments, or

- a default back to the traditional distance education practices, using high tech software and hardware and adding an expensive price tag and a more complicated method to standard DES curriculum.

After participating in NDDL for four years, holding the positions of both mentor and facilitator and being a participant observer for this research, I would suggest the NDDL instructional design and conceptual framework offer a learning environment, which in isolation, promotes innovative educational practice and encourages knowledge-building for all the learners involved (educators and students). However, the NDDL organisational structure, in the context of the school system (MoEd), did not continue to evolve into a context for learning.

When NDDL was a closed system (during the first years of its pilot project status, Figure 30), the external constraints of the larger environment (Ministry of Education and distance education schools) appeared to impact only the curriculum of the program.

![Diagram](image)

**Figure 30.** NDDL (Step One, Figure 23)

The social interaction of the triad members was focused on the learners' needs, and the NDDL learning environment was supportive of knowledge-building. At this stage the program was limited by the curriculum materials which had been developed by the Ministry of Education and distributed through the DES. This was the first obvious area of slippage between the program's theory-in-practice (stated in the conceptual design)
and the actual practice of the participants (the use of DES materials). However, the project team recognised the problem. They stated it was their intention to develop curriculum over the course of the project which would support the NDDL design (Project Handbooks, 1993 - 1996) and to adopt mediation strategies learned through the pilot years. This is consistent with error detection and correction suggested by Argyris and Schon (1978) and Senge (1990).

By Step Five (Figure 23) the project had scaled up. While there are many confounding issues that occurred during that process, the result was a dramatic change in the learning environment (Figure 31).

**Figure 31.** NDDL (Step Five, Figure 23)

Over the course of the scale up, issues arose that were in conflict with the NDDL model. These issues are discussed in Chapter Five (Section A) and are shown in Figure 31 as constraints affecting the design. Social interaction is not shown in Figure 31 as the concept of the learning triad was no longer accurate (Project Team 3, Interview, Summer Symposium 1996). As the participant group was no longer homogeneous and the communications network was over extended (Figure 17), there was little online interaction supporting knowledge-building among triad members. Also there is no evidence of ongoing professional development to assist educators (facilitators and mentors) develop skills required to support the NDDL instructional design. These factors, plus the program's continued reliance on DES curriculum impacted innovative practice. It appears that the constraints and the environment in which they occurred impacted directly on the NDDL program, moving it from innovative practice back to traditional correspondence practice. During this period
participants increasingly noted gaps between the stated intentions of the NDDL model and the actual practice, and it appears the organisation was no longer able to learn from its members and correct errors as they occurred.

Argyris' (1993, 1992) work supports these findings, suggesting environment can have a major impact on an organisation. Individuals may feel compelled to adopt the goals of the environment (e.g. organisation in which they work) rather than maintain their own. As suggested on Figure 23 (around Step Three), there is evidence that participants within the NDDL organisation stopped moving toward innovative practice and began to adopt the practices of establish distance education schools within the Ministry of Education. While unfortunate, it is not unexpected in the literature.

Thompkins (1993, p. viii), researching NASA after the Challenger disaster, observes

Organizational success is not self-perpetuating. Even the most successful and confident of organizations are vulnerable to failure. Threats take the form of unperceived changes in the environment, routinized and mechanical complacency, and the institutional forgetting of what contributed to the institution's success and confidence in the first place.

To varying degrees, these threats affected the NDDL project (Chapter Four).

Thompkins' identification of institutionalised forgetting as a threat is supported by Argyris (1993) and Senge (1990). All suggest that an organisation's memory is essential for further learning. Without it, new members (students and educators) joining an organisation have no sense of history and development, and older members have the potential to selectively remember only portions of the past. When the research began for this project, it became clear that there was no formal organisational memory for the NDDL program. I had to piece together the past from previous correspondence, old faxes and documents, and personal interviews. Had I not been a participant in the four years of NDDL operation and saved program documentation, I would not have been able to chronicle events. Even the original members of the project team stated they had no official record of the project's evolution (Project Team 1 -3, E-mail Communications, Spring 1996), adding they were too busy creating the program to record its history. Therefore, it would have been difficult for new members joining at Step Three (Figure 23) to have a sense of the project's origins and developing philosophy.

I believe NDDL was a learning organisation during Steps One - Three (Figure 23). This belief is supported by the literature presented in Chapter Two (Section B). However, researchers (Argyris, 1992; Brown, 1994; Perkins, 1992) suggest that schools are, at best, limited learning organisations. Therefore, the NDDL program is an interesting case study of a school program attempting to make the paradigm shift
from traditional practice to innovative practice, requiring it to function as an organisation for learning.

Figure 7 presents the disciplines required for organisations for learning (personal mastery, an environment supporting innovative practice, and holistic thinking). Each requires the learner (educator or student) to build personal knowledge and engage in holistic, systems thinking through continuous learning and dialogue (Figure 9). Participants in the early stages of the NDDL project expressed their willingness to learn and experiment with the new technology and instructional design. Many noted that the potential for innovative practice and the exposure to new technology was one of the major attractions to the project (Facilitators 3 - 7; Mentors 2 - 8, E-mail Communications, Spring 1996).

Figure 9 is quite a paradigm shift from traditional education practice. A shift of this magnitude will require educators to adopt the innovation of reformed practice (Rogers, 1983) and see the reason for making the change (Argyris, 1993, 1992). It cannot be assumed that educators will make this change on their own. The assumption that people will embrace innovative practice just because it is available has not been supported in actual practice. The NDDL experience, Steps Three - Five (Figure 23) suggests that without adequate support or reason to make change, participants tend to default to traditional activities. The lack of online evidence of educators discussing their changing roles (mentoring and facilitating learning) is eloquent in its absence.

Environment (eg. peer pressure, organisation power, etc.) plays a major role in encouraging change, suggesting that if change is required for promotion or bonus pay, the motivation may be higher than if it is simply a suggestion to improve practice (Elgar, 1995; Weir, 1992). Therefore, a question arises, can schools create learning environments promoting innovative practice and encouraging knowledge-building? While the answer is potentially yes, the literature suggests first, schools must incorporate what is known about knowledge-building into their practices and then develop positive learning environments.

Researchers (Brown, 1994; Perkins, 1992) suggest there is no shortage of information about learning; the shortage appears to be in the actual practice of classrooms. Figures 9 and 10 suggest attributes for learning environments. This research suggests that all learners within the educational system (educators and students) need to be actively engaged in the process of learning and therefore need to learn to express their needs into learning plans which can be modified and amended to reflect continuous knowledge-building and progressive problem-solving. The conceptual framework, instructional design, and stated intentions of the NDDL project are consistent with the attributes suggested in Figures 9 and 10.
As stated earlier, when NDDL was a first year pilot project, its focus was on improving the delivery of distance education. However, when the larger organisational pressures of the MoEd and DES were felt, learning, in the form of knowledge-building, appeared to take a secondary role to constraints affecting organisational structure and process (Chapter Five - Section A). The previous history of educational practice, focused on direction instruction, replaced the innovative practice proposed in the NDDL instructional design.

As suggested in Chapter Two (Section A), all too often it appears that learning is not the focus of the school agenda and its tends to be the first causality of the structural organisation of the institutional bureaucracy (both school based and ministry level). This is consistent with the NDDL experience (Figure 23) as there is evidence that student learning was the major focus of the Steps One through Three.

Chapter Four suggests that some of the problems associated with the decline in organisational learning might be attributed to the communications network in which the participants were expected to interact (Figure 17) and the scaling up of the project (Figure 21). While there are too many confounding factors in the project design to make a distinction as to what specifically moved the project away from innovative practice, there is enough evidence to suggest that an organisation for learning could be situated online (Figure 10). This is consistent with Handy's (1993) observation that over sixty variables can be identified which affect organisational effectiveness.

Characteristics presented in Figure 10 are consistent with the NDDL stated intentions (both the instructional design and conceptual framework). The description of mentors and facilitators, within the NDDL learning model, suggests a desire to change the traditional roles for both these educators. However, the actual practice appears to have varied considerably. There is no evidence that learners (educators or students) had a conceptual understanding of the organisational structure in which they were functioning and this in turn affected their ability to learn (Figure 9).

Without the ability to develop curriculum or assessment strategies, the staff in the NDDL project were not capable of sustaining the new roles, affecting the organisational structure, or promoting innovative practice. The constraints of the curriculum and the effect of the organisational structure supported the status quo of distance education (Chapter Four). As a member of the project team noted, the technology was permissive but the curriculum was too restrictive (Project Team 3, Interview, Summer Symposium, 1996) as were the constraints imposed by the Ministry of Education.

The tie to the traditional curriculum also supported and encouraged traditional teaching strategies. Therefore, innovative teaching strategies (facilitating learning
plans, mentoring strategies, etc.) must be built around curriculum and assessment and developed to take advantage of the potential offered by an online computer environment. Mentoring strategies (Crichton, 1993; Mason, 1991) have been developed for online learning, and it appears that the NDDL instructional design must include training in these strategies for educators in the learning triad. Once these strategies are understood, curriculum and assessment can be developed that incorporates the research on knowledge-building and online mentoring.

The present technology does have the potential to be fluid, responsive, and flexible, but if the designers of traditional learning environments design the virtual educational spaces, the chances are traditional learning will simply re-appear in a virtual setting, precluding the potential for innovation.

Recognising that organisations for learning can be situated online, a further question arises, can a virtual community of learners be formed to share tasks and common experiences? The answer would appear to be yes. The characteristics of the online environment (Figure 10) and the attributes required for learner success (Figure 29) suggest these are similar to ones needed to participate in a community of learners. Also the online environment has the necessary characteristics to support it.

A community of learners, working online, will have the opportunity to engage in socially distributed cognition (Cicourel, 1990) and develop collaborative relationships with other learners (Hiltz, 1990a). The software used for NDDL is capable of supporting real time interactions as well as asynchronous conferencing.

Personal e-mail is also an option. While the potential for community exists, interesting issues concerning participant identities arose from this research. Turkle (1995, p. 180) suggests that the online environment is "... a social laboratory for experimenting with the constructions and reconstructions of self ... ." Research into the NDDL practice found that individuals were experimenting with their online personae. There were mistaken identities, confusing ministry officials for students; older women portraying themselves as teenagers; and an honours student, who had never cheated before, taking liberties with the system. While all of these take place in face-to-face settings, the leaness of the online environment (Walther & Burgoon, 1992) appears to make these deviations from the truth even more extreme. Researchers (Cicourel, 1990; Galegher & Kraut, 1990; Walls, 1994) state that trust and respect are major components of community building. A question for further study is what affect does the development of false identities have on the trust and respect required for group interaction and community development?

An additional question related to online interaction is why some individuals appear to cope better in this environment than others. A few facilitators suggested that specific types of students did better than others in the online learning environment (Facilitator 3 & 4, E-mail Communications, Spring 1996). These traits appeared to be
different from the attributes required for success (Figure 29). However, as this research did not investigate this issue, it is a topic for further study.

In the actual practice of NDDL, it appears that a limited community of learners formed in the NDDL Law 12 course. However, there is no evidence that members of the community negotiated opportunities to encourage knowledge-building beyond the basic requirements of the DES materials. This may be related to the fact that there was no incentive to engage in these activities as the grading scheme was tied to the DES materials not the NDDL instructional design. Participating online afforded the learners support and interaction, but it did not reward them with increased grades or penalise them for not participating.

An additional factor possibly affecting community development may have been the structural organisation of the NDDL project (Chapter Five - Section A). While there are many confounding elements affecting the project, it appears that the scaling up of the project may have affected the learning opportunities of the participants. A question arises: can an organisation scale up without defaulting to pyramid hierarchies which prevent organisational learning? In the case of NDDL, scaling up and the default to a pyramid structure happened simultaneously. Further research is warranted to see if the default can be avoided. However, Senge (1990) suggests that scaling up is the death of vision, warning that the two might be unavoidable.

Principles of architecture (Alexander, Neis, Anninon, & King, 1987) and economics (Schumacher, 1973) inform the notion of growth and scale. Alexander et al. warn of the perils of piecemeal growth and growth increments (Chapter Four). In the scaling up of NDDL, it appears that the growth increments were too large (Figure 21) and the communications network was not modified to adapt to the growth (Figure 17). There is evidence the project team recognised that this might be a problem as they stated that the project might become regionalised, reorganised into smaller groups. Unfortunately, this did not happen. Further research would be warranted into regionalisation or replication of the project in small growth increments as a strategy to offset the negative affects of scaling up.

**Area for Expanded Study**

Because I approached this research from the perspective of the learners, expecting to observe the development of a community of learners among the participants of the Law 12 course, I would like to return to the NDDL project and focus on the interactions among the learning triad, building on what this research has already identified and focusing on the elements essential in this context to promote knowledge-building and to assist the educators become active members of the community of learners.
Even though this research suggests the integrity of the learning triad was not maintained throughout the project as others should have been included in the model (Figure 28), the triad had the power and mandate to make the instructional design work and engage in innovative practice. Therefore, further research into the learning triad could offer a view of how educators’ understood their changed roles. Without this, I believe a return to the innovative practice, promised by the NDDL instructional design, is impossible. Also there must be a mandate for triad members to change their practices if reformed activity is to take place.

It will be important to determine the degree to which the educators in the project view themselves as learners and are prepared to engage in active knowledge-building. Without educators participating in learning, the organisation in which they function is limited in its ability to learn (Argyris, 1993; Senge, 1990). Until an environment is developed to support educators in their continuous learning and a climate is created to encourage educators to collaborate, I believe research about learning (Brown, 1994; Perkins, 1992) and innovative practices (Scardamalia & Bereiter, 1994) will not be integrated into actual teaching activities.

**Issues For Further Research**

Some areas for further research have been mentioned in this chapter; however, four specific topics emerged as the findings from this research were being analysed, but by then it was impossible to return to the site and collect additional data.

The first topic is network architecture. Inherent in the conferencing software were limitations in terms of the chronological placements of messages. This had the affect of interrupting a conversation by interjecting a totally new topic. Therefore, design consideration reflecting the natural flow of typical human conversations must be developed. As well, principles of architecture that make some public places a delight to inhabit must be developed for the online environment, allowing for relaxed, natural human interactions. Further research into the affect that virtual public spaces have on social interaction is critical.

Network architecture plays an essential role in the development of online learning environments. Viewing the NDDL experience from strictly an operational level, the electronic conferencing environment, provided by SoftArc’s First Class Conferencing Software, appears to have dictated the instructional design, to some degree. While permissive in terms of e-mail, e-mail attachments, real time chats, and conference bulletin boards, it required the use of other software for multiple site, real time audiographic conferencing. Audiographic conferencing was supported by either Timbuktu or Apple Media Conferencing Tool software applications. While these three software tools did support the stated intentions of the project, supporting learner
interaction and the distribution of expertise, they required the participants to develop proficiency in their use and adapt strategies to function in the various environments.

Recognition of the constraints inherent in the various software applications and the attributes that are required for learners to function in these environments is essential. Future software must be developed with learners' needs in mind. It appears that current software is driven more by the hardware than the user (Spender, 1995; Turkle, 1995). For example, while the NDDL electronic network was capable of supporting almost unlimited interactions, Figure 17 suggests the people were not. Therefore, if learning environments are to support the attributes for knowledge-building suggested in this research (Figure 9), online environments must be capable of supporting and developing personal mastery and social interaction while affording the learners a holistic view of the learning context. Therefore, messages that interrupt the flow of interactions or software that offers only a screenshot picture of information prevents the learner from building knowledge within an online organisational context as it chops information up into disconnected fragments.

Research concerning knowledge-building environments must direct the future development of online learning environments, or educators run the risk of either electronically duplicating the educational status quo or compromising learner needs for computer expediency.

A second topic is the relationship between tangible and intangible organisational artefacts and participants. The potential affect these had on the NDDL participants is touched on in Chapters Two (Section B) and Four (Figure 24). Further exploration into the effect intangible artefacts have on the behavioural world (Argyris & Schon, 1978) in which people function would be warranted. Handy (1993) touches on this issue, discussing the relationships formed in organisational contexts between people, power, and practicalities. Objects identified in either the power or practicality categories are similar to those identified in this research as intangible artefacts.

Topic three is the sociology of the online world, determining the affect that manufactured identities may have on group work. Also important is determining the attributes required for online participation and a method to insure that learners are given a chance to develop the attributes before being expected to exhibit them.

A fourth topic is related to sociology, but focused on gender. It would be interesting to determine if learning environments, supported by online technology, were maintaining the same gender ratios found in traditional learning. For example, the initial project team (consisting of three main people) was comprised of two men and one woman. The mentors group incorporated in this research consisted of three women and five men, and the facilitators included four women and three men. The students were predominantly women (of the sixteen included, only two were men). This research has
already suggested that learner attributes and learning styles may affect an individuals’ activity online, but it would be interested to determine if gender affected this as well.

**Final Thoughts**

I leave this research passionate that schools must restructure themselves as organisations for learning. Within those organisations, all participants must actively engage in knowledge-building, developing the attributes of personal mastery, collaboration, and systems thinking suggested in Figure 9. Supporting those attributes is activity theory, itself, which recognises that an individual’s actions must be stimulated by needs which are subordinated to personally constructed goals. Therefore, an individual’s involvement in an organisation for learning must continue to reflect an individual’s needs. It cannot simply reflect the needs and goals of the organisation if either party intends to learn and develop.

I acknowledge that this statement will require quite a paradigm shift on the part of educational systems as it appears that educators rarely see themselves as learners. This shift will require educational institutions to radically restructure themselves in order to build a culture of professional learning and a climate for collaborative knowledge-building.

The introduction of online educational options may provide a transition to this new paradigm as educators will need to learn to use new tools and develop innovative strategies suitable for an electronic educational environment.

Sherry Turkle’s (1995, p. 10) observation “In the real-time communities of cyberspace, we are dwellers on the threshold between the real and virtual, unsure of our footing, inventing ourselves as we go along” suggests we are in a transitional period, developing strategies, based on sound research, as we explore the potential of the online world.

NDDL’s instructional design and conceptual framework are bold steps in this process. This exploration of the NDDL experience suggests that online learning environments are possible and that knowledge-building can be developed among a community of learners located in cyberspace. Negroponte’s (1995) observation that computers are not separate from our lives but a part of how we live our lives and the choices we make should be a timely reminder to educators that incorporating the potential of computer technology into innovative educational practices is as important as incorporating quality research into knowledge-building into learning opportunities. Possibly it will be the potential offered by online learning environments that may become the catalyst for educational reform.
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