LEARNING THROUGH SERVICE: COMMUNITY SERVICE LEARNING AND SITUATED

LEARNING IN HIGH SCHOOL

by

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ABSTRACT

This dissertation explores the symbiotic relationship resulting from the merging of situated learning's socio-cultural conceptualization of the nature of learning with community service learning's ethos of service. As such, I enquired into the effects of the integration of situated learning as the conceptual framework, and community service learning as both an instructional methodology and educational philosophy. Specifically, through an ethnographic investigation I sought to discover the nature and outcomes of learning which result when high school students take their skills out of the classroom into the community to help solve authentic problems.

The students with whom I worked were members of a high school computer technology class in which expectations were that they (the students) would combine learning with service by devoting ten to twenty hours to help a community agency solve technology-related problems. In this regard, eight different student groups applied their technology skills within a variety of school and community environments. Thereupon, I looked to ascertain not only if the students improved upon their already sufficient technical skills, but also what other abilities and knowledge of themselves and/or the world they appropriated. Thus, as per the defining features of situated learning and community service learning, I hoped to find evidence of learning in areas related to technological development, workplace knowledge and expertise, problem solving, group skills, personal and social maturity, and an ethos of service.

Such learning occurred and, thus, I concluded that the integration of community service learning and situated learning in this technology classroom resulted in a symbiotic relationship in which the nature and specific outcomes of learning were 1) accounted for by situated learning and 2) enhanced beyond what would normally be expected in a non-service Information Technology Management classroom in the Province of British Columbia. Hence, the well documented and rigorously determined empirical findings: 1) argue that situated learning provides a viable theoretical framework for community service learning, 2) add empirical support to the learning claims of both situated learning and service learning, and 3) suggest a means of enabling education to become more responsive to the students and the community.

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CHAPTER 1: INTRODUCTION

Setting the Context

This dissertation was engendered by four main factors. The first, born of vast variety of teaching experiences over the last twenty years, was my belief that schooling would benefit from a greater degree of student-centered teaching and learning (Smith et al., 1998). The second, flowing from my observations of the interactions between students and computers, was that educational technology's capability to hold students' attention while at the same time opening doors to the world at large somehow presented the opportunity for facilitation of such a change. In other words, I sensed educational technology had a role to play in the implementation of educational change, but was unsure of the details of such a process.

My last two incentives evolved soon after I had returned to university and began to investigate different means of consummating what I perceived to be the technology/change relationship The first of these was my discovery of community service learning, a specific educational methodology and philosophy which provided the vehicle by which technology could help break the limits of traditional classroom learning by integrating students and educational technology into the community at large. The final stimulus was realized during a research project which eventually became a pilot study for this dissertation. That is, I became aware that situated learning, a socio-cultural perspective of learning, provides an explanation for the learning occurring in community service learning. Thus, not only did it seem I had found a means of implementing technology so as to help alleviate what I thought to be particularly problematic about the educational process, but I also found the conceptual justification needed to test my hypothesis.

Dissertation Outline

My dissertation continues with a brief overview, and then proceeds to a description of the inquiry's conceptual foundations, the statement of hypothesis, and the thesis statement. These are followed by an introduction to this project's main considerations: 1) community service learning, 2) situated learning, 3) educational technology, 4) the Information Technology Management (ITM) curriculum which provided the general guidelines for the main focus of my investigation, the

students' community service learning projects, and 5) the Computer Technology 12 class which served as my sample population. The final sections of the chapter refine the research question and offer the investigation's rationale. Chapters two and three, respectively, contain in-depth literature reviews of situated learning, and community service learning. Each of the remaining chapters is devoted to the investigation, per se. Chapters four through six present, in turn, the research methodology, the research findings and related analysis, and the conclusions. Finally, come the references and two appendices.

Overview

Briefly, I investigate the learning in the 1) project component of a 2) specific Computer Technology 12 course in which student projects are directed by 3) a community service learning model based upon the specific 4) Information Technology Management (ITM) Curriculum in which 5) educational technology is the implementation vehicle for community participation. In this regard, the learning in the community service model has been determined to be conceptually described by 6) situated learning, with its nature of learning more precisely interpreted by the 7) situated learning/community service learning/ITM framework developed by Wolfson and Willinsky (1998a). Correspondingly, 8) my additions to this framework allow for the hypothesis that the juxtaposition of situated learning and community service learning expands learning to include service related outcomes. Thus, 9) my thesis argues situated learning explains the learning in community service learning, suggests learning is more expansive than would be found in a non-service model, and, finally, itemizes the resulting, specific learning outcomes.

Conceptual Foundations

My hypothesis evolved in correspondence with a growing realization of the symbiotic relationship between situated learning and community service learning. This evolution began early in the development of a pilot study for this project in which John Willinsky and I found 1) the ITM curriculum exemplified community service learning; 2) community service learning (and therefore ITM) lacked a common accepted theoretical rationale to explain the learning therein, and 3) situated learning seemed to provide this rationale:

The ITM program, with its emphasis on meaningful, real-life, cooperative, problem-solving, service-oriented work was well described by service learning. However, aware that service learning makes few detailed claims about how acts of service provide an especially conducive setting for students to learn what needs to be learned, we sought elsewhere for this rationale. As ITM's emphasis on learner participation suggested a constructivist paradigm recognizing the primacy of culture in learning, we found [theorized] that it was "situated learning" that offered this framework. (Wolfson & Willinsky, 1998b, p. 1-2)

In other words, we determined the ITM (service learning) curriculum's focus on the integration of academics, community involvement, and project management found correlation with situated learning's emphasis on the following: 1) learning through involvement in an authentic context, 2) learning through participation in an authentic task, 3) learning through cooperation with others, and 4) learning through particular means of combining the practical with the theoretical (including cognitive apprenticeship and other forms of reflection).

Subsequently, through an eight month ethnographic study of a grade 11/12 Information Technology class using the ITM model, we were able to conclude there was little doubt that in this particular ITM classroom "not only were all of the criteria [of situated learning] at least minimally met, but the evidence also suggests that many are integral to the course itself" (p. 17). Based upon this similarity of defining characteristics of these two paradigms, we then conceptualized our framework as one which suggests that this relationship between situated learning and community service learning (exemplified, in our case by ITM) be depicted through the contexts for learning that are 1) situated in 2) authentic work settings, which entail 3) collaboration with peers and mentors, and offer opportunities for 4) reflection on practice (table 1).

In other words, this conceptualization emphasizes the importance of the different sub-contexts within the greater social context, as any social constructivist understanding must do. At the same time, the framework also delineates the significant phenomena constituting each of these contexts. Thus, for instance, a situated context is characterized by participation in communities of practice, interaction with mediating artifacts, and access to multiple resources. Simultaneously, our construct also offers possible concrete instances in which these abstractions might find manifestation in a community service learning environment.

Besides explaining the relationship between situated learning and community service learning

this framework might also be said to be able to predict resulting natures of learning and general types of related learning outcomes. For, based upon the understanding that all of these contexts for learning are different, it is assumable the content and degree of learning will vary with the extent to which the learner experiences some or all of the four contexts. Thus, if one learner has greater opportunity to become involved in a collaborative context than other learners, then he or she will have a greater chance to develop corresponding cooperative skills, like team building. Similarly, various cooperative contexts composed of different constituting phenomena (one relying on peer mentoring and the other on the use of community experts, for example) will see different learning results.

My more recent exploration of the learning claims of situated learning and situated learning resulted in my second conceptual realization. That is, although the learning outcomes of both paradigms are in need of greater empirical support, the evidence which exists suggests by situating situated learning in a community service environment, learning should be changed and/or enhanced beyond what was found in a non-servcie enviornment (table 2).[1] Though both paradigms posit skill and knowledge construction, community service learning's focus on service extends these claims to include service-related outcomes such as the development of a service ethos, the development of social and personal responsibility, and a desire to participate in the democratic process (Markus, Howard & King, 1993; Kendrick Jr., 1996).

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1. As depicted by table 2, I have placed the research claims of situated learning and service learning in the same row as the corresponding situated learning context. That is, for example, because the Vanderbilt Cognition and Technology Group has determined that cognitive apprenticeship is primarily responsible for learning transference, learning transference has been placed in the row containing that context. Similarly, some outcomes such as improved problem-solving, I have attributed to "problem solving scenarios." However, as it is impossible to entirely ascribe these learning outcomes to one context, the lines of the chart between each of the rows are dotted to indicate that these placements are not immutable, and that contexts are not mutually exclusive.

      Another notable aspect of the chart is that learning outcomes associated with the Keedy and Drmacich (1994) investigation (in bold) can be associated with both situated learning and service learning. The significance of this will be explained later in this paper.

      Finally, it can be noted that I changed the "Reflective" context heading of our first chart to "Reflective/Theoretical." This is more appropriate, I think, because where reflective refers to thought after an action, theoretical refers to thought before the activity (such as planning and cognitive apprenticeship). Thus, the "Theoretical/Reflective" heading can be considered as part of a circular process comprised of theory, action, and reflection.

Hypothesis

Thereupon, I hypothesize that through the intersection of situated learning and community service learning there results a combined learning process which 1) finds realization through service to the community, 2) attributes learning to, and is analyzable of, our four contexts of situated learning, and 3) as per the general nature of learning, promises (for example) increased expertise, greater knowledge of community, improved problem-solving and group work skills, personal development, and the growth of the will to serve. In other words, the merging of situated learning and community service learning results in a learning process in which learning outcomes are delineated by the four contexts of situated learning, and by the giving of service.

Thesis Statement

Thus, I argue that through the merging of situated learning and community service learning via the service component of a specific Computer Technology 12 course utilizing the ITM curriculum, 1) the nature of the students' learning in community service learning programs results from, and is analyzable in terms of the socio-cultural context of situated learning, described as reflective/theoretical, situated, authentic, and cooperative;

2) with the development of a service ethos among the students, the learning outcomes for the ITM course can be said to go beyond what is expected of the typical Information Technology course in British Columbia (Ministry of Education, 1997).

3) that differing degrees of evidence argue for student learning in the following specific areas:

a) group skills, b) problem-solving c) technology skills, d) workplace responsibility, e) project management skills, f) personal development including confidence, responsibility, independence, and patience, g) service ethos, and h) community of practice knowledge.

Introduction to Situated Learning

Situated learning is a constructivist paradigm which posits that the social context for learning sets the stage for the individual construction of knowledge. Unlike the more common Piagian notion of individual constructivism which gives little thought to the type of environment, situated learning argues learning is a social construct best understood through contextual analysis (Rogoff,

1990). That is, although one's learning is ultimately constructed within one's own mind, it is through authentic interactions with knowledgeable individuals in authentic settings that the stage for construction is set. Unlike the individual constructivist notion which regards the mind as explanatory and the outer world as being in need of explanation, social constructivism posits the environment explains why we have certain thoughts and perceptions (Marton & Booth, 1997).

Of course, this position does not deny that all learning is situated somewhere, but argues instead that specific learning outcomes are best accomplished by combining theory with relevant practical (situated) applications.[2] In other words, social constructivist analysis asks how surrounding fields of social, cultural, societal forces make certain ways of acting and certain ways of thinking possible for the individual (Marton & Booth, 1997). Thus, situated learning argues the practice of learning must be primarily oriented to the solving of authentic problems occurring in appropriate (authentic) contexts comprised of legitimate participants, one or more of whom is able to guide the learner to higher levels of understanding. Thereupon, the corresponding nature of learning is authentic-problem oriented, authentically contextualized, cooperative and mentored, and reflective. According to the situated learning paradigm, then, if one wishes to become a teacher, there is no better way of learning than through guidance by an accomplished teacher in the solving and reflecting upon authentic teaching-related problems (such as lesson planning), within an authentic community of practice comprised of teachers, students, administrators, and the greater community.

Introduction to Community Service Learning

Presently, community service learning is characterized by a number of different interpretations. However, in most general terms it can be described as an educational process in which students use their academic expertise to engage in projects aimed at servicing community needs. It is based upon the premises 1) students are owners and potential purveyors of valuable skills and knowledge,

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2. As will be explained in the literature review, although differing perceptions of situated learning view the relationship between theory and practice differently, all do accept its relevance. One commonality among all these variations is the belief that more knowledgeable participants must pass along their expertise (theoretical and/or practical) to the novices.

2) community agencies are in need of such assistance, and 3) community service offers significant social and academic rewards. Briefly stated, service learning is envisioned as both "an instructional methodology that facilitates the involvement of children and adolescents in real-life settings" (Fertman, Buchen, Long & White, 1994, p. 1) and "an individual or group act of good will (service) for a person, group or community, based on planned educational outcomes (learning)" (Olszewski & Bussler, 1993, p. 4).

Both of these representations, in their lack of reference to a reflective element, something many community service learning theorists and practitioners consider vital, are indicative of a general lack of agreement about many aspects of community service learning. Whether community service learning is a philosophy or methodology, an act of charity or societal critique, and/or best implemented in a compulsory or voluntary manner are but three of these debates. At the same time, community service learning also lacks a commonly accepted theoretical framework, and sufficient research findings to allow for comfortable agreement regarding its precise academic, personal, and social effects.

As problematic as this may all be, however, among those familiar with community service learning, there is little dispute that it is a positive educational force whose potential has just begun to be realized. Accordingly, the character of community service learning is multifaceted. Because community service learning is a particular example of situated learning, the resulting nature and outcomes of learning are those described by the generic situated learning model. At the same time, however, because community service learning focuses upon learning through service, learning outcomes are consequently effected. Thus, they are expanded to encompass those outcomes of learning associated with the development of a service ethos and other aspects of altruism and citizenship.

Technology and Educational Technology

Although the term "technology" may conjure up variety of different understandings and images, it can be concisely defined as the practical implementation of intelligence (Ferre, 1988), and/or the embodiment of human ideas (Levinson, 1988). Within these parameters, however, there

Table 1: The Relation of Situated Learning Principles to Service Learning Activities
Using the Example of the Information Technology Management (ITM) Program

SITUATED LEARNING Learning results from...	SERVICE LEARNING Possible instances...
A. SITUATED CONTEXTS 1. Communities of Practice (Brown & Duguid, 1993; Lave & Wenger, 1991) 2. Artifacts as Mediating Devices (Engestrom, 1990; Moll, 1990) 3. Multiple Resources (Goldman, 1992; Lave & Wenger, 1991)	Students form project teams to offer their new technology and project management skills to the local community centre where they will interact with, learn from, and utilise the resources of the centre and local businesses to help the centre achieve its mission.
B. AUTHENTIC CONTEXTS 1. Authentic Projects (Engestrom, 1990; Lave & Wenger, 1991) 2. Problem Solving Scenarios (Rogoff, 1990) 3. Intrinsic Motivation and Student Responsibility (Volpert, 1989; Collins, 1994) 4. Dynamic Assessment (Lunt, 1993)	Students engage in development of the community centre's web page which serves as an educational/ advertising tool for the centre. Students design web page representative of the community centre and accessible for all. Ongoing monitoring of page's utilisation and value, while transferring skills to centre staff.
C. COLLABORATIVE CONTEXTS 1. Small Group Interactions (Brown, Collins & Duguid, 1989; Saxe, Gearhart, Note & Paduano, 1993) 2. Skilled Peer Guidance (Rogoff, 1990; Tudge, 1990) 3. Community Expert Guidance (Lave & Wenger, 1991)	Students divide responsibilities among components of the project while working in close consultation with centre staff, with community professionals for provide services necessary to achieve success, and other students peers who have related experience in this type of task.
D. THEORETICAL /REFLECTIVE CONTEXTS 1. Goal Setting (Collins, 1994) 2. Formative Assessment (McLellan, 1993) 3. Cognitive Apprenticeship (Brown et al., 1989; Collins, Brown & Holum, 1991) including Teacher Modelling & Scaffolding (Collins, Brown & Newman, 1989) 4. Critical Reflection (National School-To-Work Learning and Information Centre, 1996)	Students engage in individual and project-team meetings in the classroom with their teachers. They review goal-setting and skill-assessment, while teacher poses critical questions on their work and that of the community centre, while preparing them to report on the scope of their learning.

Table 2: The Learning Outcomes Of Situated Learning Versus The Learning Outcomes Of
Community Service Learning

SITUATED LEARNING CONTEXTS	LEARNING OUTCOMES OF THE SITUATED LEARNING ENVIRONMENT	LEARNING OUTCMES OF THE SITUATED LEARNING/SERVICE LEARNING ENVIRONMENT
THEORETICAL/REFLECTIVE CONTEXT (Vygotsky, 1994a) 1. Goal Setting (Collins, 1994) 2. Cognitive Apprenticeship (Brown, Collins & Duguid, 1989; Collins, Brown & Holum, 1991; Collins, Brown & Newman, 1989) 3.Formative Assessment (McLellan, 1993)	-Academic achievement (Allan and Thompson, 1995; Keedy and Drmacich, 1994) -Learning transference (The Cognition and Technology Group at Vanderbilt, 1994)	-Academic achievement (Markus, Howard & King, 1993) -Development of a service ethos (Kraft, 1996) -Development of a societal critique (O'Grady & Chappell, 1997) -Development of positive values and attitudes (Williams, 1991) -Improved self concept (Kraft, 1996) -Improved sense of personal efficacy, self esteem and self-confidence (Giles Jr. & Eyler, 1998) -Development of feelings of connection to community (Giles Jr. & Eyler, 1998)
SITUATED CONTEXT (Vygotsky, 1994b) 1. Communities of Practice (Brown & Duguid, 1993; Lave & Wenger, 1991) 2. Artifacts as Mediating Devices (Engestrom, 1990; Moll & Greenburg, 1990) 3. Multiple Resources (Goldman, 1992; Lave & Wenger, 1991)	-Legitimate peripheral participation (Lave and Wenger, 1991) **-Connections between classroom and real world** (Keedy and Drmacich, 1994) -Knowledge of different communities (Damarin, 1993) -Understanding and use of aritfacts (Engestrom, 1990)	-Development of career maturity (Williams, 1991) -Development of political skills (Giles Jr. & Eyler, 1998) -Improved racial tolerance (Giles Jr. & Eyler, 1998) -Improved citizenship skills (Wade, 1997)

Table 2: The Learning Outcomes Of Situated Learning Versus The Learning Outcomes Of
Community Service Learning (continued)

AUTHENTIC CONTEXT (Vygotsky, 1981) 1. Authentic Projects (Engestrom, 1990; Lave & Wenger, 1991) 2. Problem Solving Scenarios (Rogoff, 1990) 3. Intrinsic Motivation and Student Responsibility (Collins, 1994; Volpert, 1989) 4. Dynamic Assessment (Lunt, 1993)	-Transference to higher order problem solving (Billet, 1994) -**Attendance** (Keedy and Drmacich, 1994) -Problem solving (The Cognition and Technology Group at Vanderbilt, 1994)	-Improved school attendance, (Markus et al., 1993) -Greater participation in community,(Markus et al., 1993) -Development of a systematic approach to social problems (Giles Jr. & Eyler, 1998) -Generally greater learning (Conrad & Hedin, 1991)
COLLABORATIVE CONTEXTS (Vygotsky, 1994b) 1. Small Group Interactions (Brown et al., 1989; Saxe, Gearhart, Note & Paduano, 1993) 2. Skilled Peer Guidance (Rogoff, 1990; Tudge, 1990) 3. Community Expert Guidance (Lave & Wenger, 1991)	-Achievement (Johnson, 1981) -Cooperative devlopment (Johnson, 1981) -Higher quality and more creative problem solving (Johnson, 1981) -**Equal opportunity for minority and low SES students** (Keedy and Drmacich, 1994)	-Improved relationship building (Giles Jr. & Eyler, 1998) -Improved helping skills (Markus et al., 1993) -More positive attitudes to peers (Conrad & Hedin, 1991) -Development of favourable attitudes to adults (Conrad & Hedin, 1991) -Development of social skills (Giles Jr. & Eyler, 1998)

is little common agreement as to the effects of technology. At one end of the continuum, for example, technology may be seen simply as a neutral, malleable tool to be wielded at one's desire, and at the other, as a way of thinking and acting that both consciously and unconsciously permeates and mediates all aspects of our lives. In other words, there tends to be general agreement as to what technology is, but little consensus regarding its outcomes.

Educational technology refers to the application of technology for educational purposes, or said differently, educational technology is a particular approach to achieving the ends of education (Ely, 1993). Examples of this technique include the use of blackboards and chalk, and the organization and structure of schools. Thus, it might be said schooling and educational technology have always been inseparable. However, it was not until the advent of radio and instructional television that educational technology began to be seen as an entity of its own, with computers presently considered the epitome of technological manifestation (Cuban, 1986). At the same time, somewhat paralleling the debate regarding the general effects of technology, the argument regarding technology's epistemological attributes was born, and continued to develop at an ever increasing rate.

Significant within these considerations is the argument concerning the effects of technology on the nature of learning. Although a comprehensive investigation of this debate falls well beyond the scope of this dissertation, one brief and relatively well accepted response might be that the related nature of learning is dependent upon the way that the technology is used.[3] That is, research suggests if technology is implemented with and eye toward change, as was the case in this class under study, then the nature of learning has the potential to be correspondingly revolutionary in its empowerment of the learners. On the other hand, if technology is applied in a more traditional manner, then the essence of learning will continue to remain both teacher and content-centered (Schofield, 1995). Hence, the non-traditional character of the students' projects herein argues that the resultant nature of learning and learning outcomes will be non-traditional, or change-oriented.

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3. For a comprehensive investigation of the role of technology and educational technology, one might search the literature on the philosophy of technology.

At the same time, though, as will be elaborated upon as part of my justification for this project, one aspect of educational technology is its role as an initiator and/or exacerbator of educational discrepancies between different interest groups (Sutton, 1991). That is, as evidence argues educational technology often tends to favour Caucasian males from upper income group, the resulting nature of learning could be described as being biased. However (as will be later discussed), although certain gender-related anomalies did surface, this investigation did not allow me to arrive at any conclusions concerning technology's part in this regard.

Meanwhile, within the scope of the debate regarding the attributes of technology, the prevalence and influence of computers in schools continues to grow. The following list illustrates this variety of applications:

a) computer assisted instruction: the computer simulates drill and practice exercises needed to teach certain automatic and repetitive functions,

b) computer aided writing: keyboarding skills facilitate the mechanics of writing,

c) computer assisted composing: creativity and composition are enhanced through partnership with the computer,

d) mathematical applications: the computer performs mathematical operations, runs mathematical models, simulates/presents mathematical problems,

e) technical/artistic applications: graphic representations, page layout, computer assisted drafting, photographic manipulations, computer assisted art and design, video/multimedia productions,

f) musical applications: composing, musical instrument simulations,

g) business orientations: keyboarding, spread sheets, data bases,

h) computer science: computer programming, computer maintenance and repair, network design and maintenance,

i) research: electronic referencing on CD ROM, and other digital applications and data bases,

j) computer mediated communication (a form of telecommunications or networking): e-mail, electronic bulletin boards, teleconferencing, electronic data bases, electronic networks, and live talk or chat.

Most importantly, according to the most recent surveys, networking (as described in 'j" above) is one of the fastest growing trends in education. Thereupon, another major educational propensity is that which equates educational computing with Information Technology Management (ITM), a technological perspective which emphasizes the application of hardware and software for the purposes of networking and other forms of communication (Ely, Blair, Lichvar, Tyksinski & Martinez, 1996). In other words, the most common educational facet of computing is based upon the teaching of means of developing and managing computer-oriented communications. Significantly, the computer technology class which is the focus of this investigation was categorized as an information technology management class, although the students' projects were not necessarily concerned with the communicative aspects of technology.

The Information Technology Management Curriculum (ITM)

The Information Technology Management Curriculum is a specific, 134 page information technology management curriculum and resource guide developed by Knowledge Architecture, a private company working sometimes in partnership with the Federal and Provincial Governments, and school boards to develop and provide information technology instructional vehicles for grades ten through twelve. Most generally, ITM describes itself as an information technology program by which senior high school students can improve their skills and benefit the community by combining in-class learning with technology oriented service to the school district:

> The Information Technology Management Curriculum (ITM) is a curriculum for Grades 10, 11, and 12, designed to provide students with skills and problem-solving experiences that are demanded by technology environments in both industry and post-secondary education. The program combines technical content, in-school work experience and an exploration of the social and work place issues of Information Technology. In addition, the program will provide exposure for students through on-line mentoring facilitated by industry partnerships from the information technology sector. Through this program the students provide much needed services for the maintenance and development of technology systems in the high school and its feeder schools, thereby assisting their school district in optimizing existing resources and planning for new education technologies. (Forssman & Willinsky, 1995, p. 1)

Furthermore, the introduction to the ITM curriculum explains that the program is organized around the "acquisition and application of a broad understanding of information technology which includes both the technical elements of systems planning, implementation and management, and the

social aspects of providing information technology to a client base, in this case, the school community" (p. 3).

Included within a detailed elaboration of the program's organizing principles, the curriculum makes reference to one particularly relevant curricular requirement, project management skills. In this regard, it suggests "students need to acquire project management skills that will enable them to effectively utilize time and resources at their disposal, and recognize the roles and responsibilities of project collaboration with others" (p. 3). Thus, while regarding project management as "the art of directing and co-ordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time, quality, and participant satisfaction " (The Project Management Institute cited in Forssman & Willinsky, 1996, p. 3), Forssman and Willinsky describe how project management provides the most productive and realistic approach to the successful completion of the students' community projects. However, as will be further elaborated upon, the lack of a project-oriented classroom component in the class under study resulted in the want of a forum in which students could receive formalized direction in the development of their project management skills. Hence, what they did learn in this regard seemed primarily to be a function of their on-site work.

At the same time, the Introduction to the Curriculum and Resource Guide also gives special emphasis to the service component of the program, stressing "to have students provide technical support services to the school community on a client-contract basis is an important part of the ITM curriculum" (Forssman & Willinsky, 1995 p. 4). Thus, it goes on to suggest that this educational technique will not only benefit the school, but call upon the students for the development and application of a special set of capabilities while challenging the "more traditional notions of students working in their desks" (p. 4).

Regarding my purposes herein, the significant aspect of the ITM curriculum is that it was seen to exemplify a community service learning/situated learning model through its emphasis on the following: 1) service to school and school community, 2) the development of technological and project management skills through practical and theoretical amalgamation, 3) a cooperative project

management approach utilizing the skills of knowledgeable peers and community experts, and 4) reflection on the place and effects of technology. Consequently, the corresponding nature of learning can be expected to be similar to that which I earlier described as pertaining to a situated learning environment embellished by a community service ethos. Specifically, however, ITM's emphasis on technology and project management suggests technology and project management skills should be highlighted within the four contexts.

<div align="center">The Computer Technology 12 Class</div>

The Computer Technology 12 class at Western School was described in the 1997/98 school calendar as "an advanced course in personal computer networking and local area network (LAN) management . . . both hardware and software areas are examined closely." Composed mainly of grade 12 students with higher than average computer skills (as expressed by the students and their teacher), the course objectives stress the development of a combination of theoretical understandings and practical applications of a number of technological skills associated with IBM compatible personal computers (PC), and related hardware and software. In terms of the different applications of educational technology previously delineated, it can be said the emphasis in the Computer Technology 12 class was on information technology management as manifest through computer science, research, and computer mediated communication. Besides the technological orientation, class objectives are stated to include personal growth, and the development of an understanding of how to run a business.

As expressed in the outline, course assessment was to be based upon demonstrations, hands-on practice, quizzes, projects, and exams. It was within the "projects" category that the community service learning component was integrated, and as Dr. Taunton (the class teacher) indicated, would be used to help determine the student's overall course mark. Although Dr. Taunton originally stipulated two projects, one of 20 to 30 hours and another of 5 to 10 hours, these time-expectations did not necessarily come to fruition. Because of the uncertainty associated with first year implementation of a project component in the course, and because the projects were all very different, it proved to be difficult to set consistent expectations for all. As a result, the time varied

considerably for each of the students who participated in the community service learning projects, from approximately 10 hours to approximately 25 hours, usually spread over several months. Part of the reason the projects' hours varied so considerably was because Dr. Taunton was responsible for organizing the school's work experience component of the provincial Career and Personal Planning Course (Province of British Columbia, 1994) in which students need 30 hours of work experience to graduate. Thus, for certain students, he was able to combine their work experience requirement with the class project and appropriate a greater number of hours on-site.

What was particularly relevant about the Computer Technology 12 class, was that Dr. Taunton and I modelled its project component upon on the general precepts of the ITM curriculum. In most general terms, students were expected to complete projects in which they used their academic expertise (as taught in the classroom) to solve community, technology-related problems. These expectations included that students, in conjunction with their teacher and clients, determine a client-need, plan and execute strategies to solve the related problems, document progress, and maintain communication among all interested parties. Student evaluation, via client feedback, self-assessment and reflection, and teacher assessment, was to be based upon written and oral reports of all those involved. Though many of the more specific points of the ITM curriculum were not used as a daily guide, the intent and processes varied little from that described by the curriculum as a whole, and our understanding of the philosophy of the project component certainly was expressed by the ITM curriculum.

There were two significant difference between the practices of the Computer Technology 12 class and the ITM curriculum. The first was that unlike the ITM curriculum which specified the service be oriented toward the school and school district community, Dr. Taunton's class was mainly involved in service to the outside community. In this regard, then, it might be said to more closely resemble community service learning's openendedness. The second difference was the on-line element of the course was not used as suggested. That is, Studio A, an Internet site developed by Knowledge Architecture to assist in the record keeping, mentoring, communications, and other networking aspects of the projects was never used or referred to in more than a cursory

manner by one or two of the students. This was due to a lack of Internet connections on the part of the students, and problems with Studio A, itself. In what manner or to what degree this effected project outcomes was not a subject of this investigation, and the inability to utilize the Internet site certainly did not seem to be of concern to the students, clients, and/or the teacher. However, student and teacher use of Studio A certainly would have given the projects more of an information technology focus than was necessarily the case.

The Research Question

This study investigates the nature of learning and related learning outcomes when a specific set of high school technology students participate in community service learning. It, correspondingly, inquires into the ways in which the nature of learning, and resulting learning outcomes are expanded through the juxtaposition of community service learning upon a situated learning model. As such, it demands elaboration upon and specification of the following terms: students, community service learning, situated learning, participation, the nature of learning, and learning outcomes. These, I now discuss in turn.

As previously indicated, the "students" were the students in the Computer Technology 12 class who participated in the service learning component. Generally, the skills which they were wishing to improve were of a technological nature. In addition, expectations of the course as a whole, including the service component, were that students would also develop their personal and business oriented skills.

The second and third terms, "community service learning" and "situated learning," need no further elaboration other than to reiterate that the learning occurring within the former is accounted for by the latter.

Third, we have "participation," which refers to participation in the community service learning component of the course. In particular, however, the conceptual framework's delineation of four different contexts for participation suggests a more precise inquiry into the learning outcomes associated with each of these contexts.

Fourth, the nature of learning, refers to the general characteristics or attributes of learning

experienced and/or demonstrated by the learners. For example, in a competitive environment the nature of learning might be said to be competitive while in a collaborative situation it would be, correspondingly, collaborative.

Finally, for an understanding of the meaning of outcomes of learning, or more commonly, learning, I find satisfactory all of the following definitions offered by Webster's Third New International Dictionary, Unabridged (1996):

a: to gain knowledge or understanding of or skill in by study, instruction, or experience,
b: to develop an ability to or readiness for by practice, training, or repeated experience,
c: to become aware,
d: to acquire (as a skill or habit or a modification of an existing habit) through experience, practice, or exercise.

It follows, then, regarding the Computer Technology 12 students who participated in the course's community service component, I ask the following:

1) what are the general characteristics and/or attributes of learning experienced?

2) what specific knowledge or understanding did they gain, what abilities did they develop, what new awareness did they develop, and/or what skills or habits did they acquire?

3) how does the situating of situated learning within the community service learning environment change/increase learning outcomes beyond what could be expected in a non-service environment?

4) how do the nature of learning and learning outcomes vary as per variations in the learning contexts?

5) what other aspects of the nature of learning (as for example, gender bias) seem to be effected by this situated learning/service learning model?

Rationale for the Study

The justification for embarking upon this study is sevenfold. The first three of these rationale concern the need to provide empirical support for the learning claims of situated learning and community service, the uniqueness of this study's juxtaposition of situated learning and service learning, and the increasing emphasis on the school-to-work relationship. The remaining four rationale are related to that aspect of this investigation which is devoted to the search for a means of applying educational technology in a positive manner. Specifically, these are related to the findings

that 1) computers and their related hardware and software are continuing to proliferate in schools;
2) those benefits of educational technology which do exist are best realized in particular
applications; 3) the benefits of educational technology are not distributed equally among all
stakeholders, and 4) there exists significant institutional and personal resistance to educational
technology.

Beginning with the rationale concerning the need to provide empirical support for the learning
claims of situated learning and community service learning, each of the seven shall now be
elaborated upon in turn. First, this study of the ITM class will help support some of the assertions
of service learning and situated learning. As will be elaborated upon in the two literature reviews,
although there is considerable literature devoted to the virtues of both situated learning and service
learning, there is a decided lack of empirical support for their learning claims (as there is little or no
support for this combination of the two). Thus, support for the finding that community service
learning and situated learning improve learning could increase the possibilities of varying the
processes of schooling while making learning more relevant and productive.

The second justification for this study is that the Computer Technology 12 class provides a
unique opportunity to study the educational effects of the merging of situated learning and
community service learning. Though there must be a number of programs in which community
service functions as an curriculum implementation vehicle, my exhaustive search of both the situated
learning and service learning literature located only one other study in which such integration was
emphasized. Furthermore, although this study by Keedy and Drmacich (1994), offered cursory
allusion to learning through service, there was no mention of the term "community service
learning." In other words, it seems possible my study is the first to consciously consider and
investigate the theoretical and practical results of the integration of these two learning paradigms.
As such, it offers the possibility of further supporting my contention that situated learning offers
the rationale for learning in community service learning.

The third rationale is a function of the increasing emphasis on career education within the
education system (Balcombe, 1995; Gullekson, 1995). As much of ITM's focus on experiential

learning and project management coincides with so-termed "employability skills," a better understanding of the nature of learning inherent in ITM curriculum could encourage more effective means of integrating education and the world of work (Leroux & Lafleur, 1995). In other words, evidence of significant and multifaceted learning occurring in a situated learning environment might be used to give support for the increasing number of career development type programs across Canada (Technology and Life Skills Task Force, 1989). More consequentially, I think, ITM's emphasis on community service may help determine and promote the educational rewards of work-oriented involvement with service agencies, something particularly significant in regard to the service sector's growing importance in society (Rifkin, 1995).

I now turn to those rationale more directly related to those aspects of this investigation which are concerned with the search for beneficial means of implementing educational technology. First, regarding the ongoing proliferation of computers in schools, it is reported between 1981 and 1986, the number of American public schools using microcomputers rose from 18% to 96%, and from 1984 to 1988 the total computer usage rate of students at schools increased from 27.3% to 42.7% (Hart, 1993). By 1995, with the American student to computer ratio falling to 12:1, computers were found to be "pervasive in schools and higher education institutions [as] virtually every student in a formal education setting has access to a computer" (Ely et al., 1996, p. 11).

In Canada, numbers are similar. For example, in 1997 it was reported that one half of all schools were connected to the Internet, and the student-to-computer ratio for the country as a whole was 11:1 (Spandier, 1997). More recently, the Vancouver School Board announced its goal was to decrease the present student-to-computer ratio for elementary school students from 12:1 to less than 7:1, and for high school students from 8:1 just over 4:1. In a similar fashion, the Premier of the Province of British Columbia stated his government would increase funding to rural schools so all students would have equal access to the Internet (Culbert, 1998).

In itself, this proliferation of computers in schools suggests a need for ongoing research into its educational effects. However, additional justification is offered by the more current findings that "advocacy for the use of educational technology has increased among policy groups, . . . new

delivery systems for educational technology applications have grown in geometric proportions, . . . educational technology is perceived as a major vehicle in the movement toward education reform" (Ely et al., 1996 , p. 21, 29, 35). In other words, if computers are assuming this growing importance, it is imperative the results of their new role be investigated.

The next justification for this study regards the potentially beneficial effects of technology. That is, it has been generally found that computer technology, when implemented with an eye to change, allowed the teachers to act more as facilitators and friends rather than authority figures as students tried harder and enjoyed their work much more (Schofield, 1995). Similarly, a number of investigations primarily into the communicative potential of computers found the use of e-mail and electronic bulletin boards facilitated student interactions and horizontal communications and better enabled "students to create their own agendas to fulfil their needs" (Bresler, 1990, p. 136), and "computer mediated dialogue structured around ongoing classroom activities can enhance its productivity and raise it to a new level of excitement" (Goldberg, 1988, p. 28). So, too, it was determined the "interactive, non-hierarchical structured context [of the Internet] appears to encourage children to ask questions and teachers to communicate in imaginative ways while discouraging the use of managerial language" (Harris, 1994, p. 252). Thus, I suggest if computers do offer such potential benefits, it is important more research be initiated into determining the best means of achieving these results.

The sixth justification for this inquiry ensues from the findings that educational technology has favoured boys, the middle and upper economic classes, and the ethnic majorities (Acker & Oatley, 1993; Bryson, 1993; Schofield, 1995; Robyler, M. D., Dozier-Henry, O., & Burnette, A. P, 1996; Willinsky, 1996). As a result, already existing educational disparities have been exacerbated and/or new one have developed. Specifically, "the evidence indicates that computer use during the 1980s did not bring education closer to equal educational opportunity. Rather it maintained and exaggerated existing inequities in educational input, processes of computer learning, and output" (Sutton, 1991, p. 494). Thus, it is imperative new research be instigated to discover processes by which these disparities might be alleviated. And, although, this was not a primary focus of this

investigation, I did hope to determine that though this particular application of educational technology positive and non-biased learning would result.

The final rationale concerns the finding that there tends to be a great deal of teacher and system resistance to the implementation of educational technology (Bailey & Cotlar, 1994; Cuban, 1986). It has been determined, for example, that because many teachers had to implement predesigned computer curriculums which they did not understand and of which they could take no ownership, they felt de-professionalized and deskilled (Apple & Jungck, 1990). At the same time, many teachers often thought computers add little of value to current practice, while disrupting the traditional atmosphere with which they are most comfortable (Schofield, 1995). In other words, it is apparent that for a variety of reasons many teachers are delaying the implementation of educational technology in their classrooms and their schools. Thereupon, it is my hope the results of this investigation will help some educators come to understand at least one benefit of educational technology and, hence, encourage them to play a role in its corresponding implementation.

At this point I must pose the potential argument that this study is not primarily about technology and, thus, these rationale are irrelevant. To this I respond as follows. First, although I investigate the results of community service learning, the determined outcomes are those which ensue directly from a very particular application of student technology skills. Thus, while it is possible to argue that some of the student learning might be the same if the students engaged in other forms of community service learning, such an inquiry is not the intent of this investigation. In other words, this study concerns itself with what Computer Technology 12 students learn when they use their technology skills to solve technology problems in their community. Just because English 12 students working on a community newspaper might learn the same things (except, of course, the technology skills), does not suggest this investigation is not about technology.

My second rejoinder regards my four above mentioned concerns about the implementation of educational technology. That is, each of these regards the fact that while educational technology is proliferated at an increasing rate, there are major disagreements as to its effects. As such, this dissertation specifically investigates the learning outcomes of one particular instructional strategy of

applying educational technology, community service learning. In this regard, if the results are positive, it can be concluded this approach is one which might be pursued and encouraged. Thus, I argue, this investigation is specifically about the effects of one application of educational technology. In the same way, then, if I was investigating the integration of English and community service learning, I might be able to conclude community service learning is a positive means of teaching English skills.

CHAPTER 2: SITUATED LEARNING LITERATURE REVIEW

Introduction

Chapter two presents an overview of situated learning. It begins with an overall perspective of the paradigm, and then moves to an explanation its origins and recent developments in the field. The chapter then discusses issues regarding the transfer of situated learning, critiques of situated learning, the relationship between situated learning and technology, research informing educational applications of situated learning, and the significant lack of empirical support for situated learning. The final three sections of the chapter describe a "typical" situated learning classroom, address appropriate means of assessment in a situated environment, and draw conclusions.

An Introductory Perspective on Situated Learning

Although theories about the nature and processes of learning remain contested, Piaget's ahistorical and non-contextual constructivist paradigm is presently dominant (Rogoff, 1990). Emphasizing logic, deduction, and rationality, learning is attributed to the individual construction of representations of knowledge in memory and, in turn, the application of these mental models across settings (Jonassen, 1984; Tudge, 1990; Woolfolk, 1990). Of special significance, then, is the centrality of the individual as meaning-maker, and the need for "decontextualizing knowledge so that, abstracted, it may became generalizable, and therefore transferable to situations of use in the real world" (Lave, 1997, p. 18-19). Accordingly, this cognitive approach holds that both its scientific and educational success can be attributed to "the careful cognitive task analysis of the units that need to be learned" (Anderson, Reder & Simon, 1997, p. 21).

In contrast, situated learning accents knowledge as "something that exists in interaction among individuals, their activity, and the context in which that activity takes place" (Jacobson, 1996, p. 20). Thus, the individual and the internal process of the mind as the basic units of analysis are replaced by the "social and cultural genesis and appropriation of knowledge" (Billett, 1996, p. 264). At the same time, however, situated learning does not totally dismiss constructivist analysis of the learning task but rather its main interest is the culture of learning or what James Greeno (1997) describes as "the trajectory of participation" that can take place within "communities of practice," as students

engage in a form of learning that is "more personally and socially meaningful and [allows] students to foresee their participation in activities that matter beyond school" (p. 11).

Situated learning, then, though certainly not denying thinking takes place in the mind, is distinguished by its emphasis on learning as more of a form of participation in and with the environment rather than as a decontextualized cognitive task. The archetypal study of situated learning, according to Marton and Booth (1997), is Hutchins' (1993) description of how a ship is navigated on leaving San Diego Harbour:

> What this takes is not capabilities within one individual, but capabilities distributed over several individuals plus the coordinator of those capabilities. Knowledge is also seen as being embedded in the artifacts used, in this case the navigational instruments (p. 10).

Lev Vygotsky and the Development of Situated Learning

Though present interpretations may vary, situated learning (or situated cognition as it is also termed) originates with the work of the Russian psychologist and paedologist, Lev Vygotsky, whose work during the earlier decades of this century took exception with many traditional ideas about education and child development (van der Veer & Valsiner, 1991). Finding fault with the individuated, independent, and ahistorical approach, his work countered with the following three motifs:

> 1) reliance on genetic (i.e., developmental) analysis; 2) the claim that higher mental functions in the individual have their origins in social life; and 3) the claim that an essential key to understanding human social and psychological processes is the tools and signs used to mediate them. (Wertsch, 1990, p. 113).

In other words, Vygotsky thought as persons aged they passed through a number of distinct developmental stages in which they were particularly sensitive to the mediation of particular socio-cultural events and artifacts that, in turn, ordered and influenced learning.

At this point, it might be appropriate to add that Wertsch (1985) suggests it is Vygotsky's assumption of a unidirectional relationship between mental development and the environment which is the most susceptible to criticism:

> The practical intelligence of the natural line of development is transformed as a result of coming into contact with aspects of the social line . . . even if one were to devise such a unidirectional account of the dynamics between the two forces, one would have to specify what is transformed

as well as what transforms it. (p. 48)

Similarly problematic, adds Wertsch, is that Vygotsky does not adequately deal with what he means

by natural development, particularly in light of the research which indicates there is no such thing as

universal natural development. However, he also adds that rather than dismissing this perspective,

more investigation is required:

> Although Vygotsky's account of natural development is a weak link in his overall line of
> reasoning, I would not suggest that the weakness can be rectified by abandoning this aspect of
> his approach. Indeed I would argue that his theoretical approach could not remain intact if his
> claims about emergent interactionism were dismissed because it would change the basics of this
> theory. Instead, it seems most reasonable to say that this is a point at which his empirical
> research failed to explore an issue that is an essential part of his methodological framework. (p.
> 48)

Flowing from his basic framework, Vygotsky (1994b) proposed that both social interactions

and cultural context are integral to cognition because "man is a social creature, that without social

interactions he can never develop in himself any of the attributes and characteristics which have

developed as a result of methodological evolution of all humankind" (p. 352). Accordingly, rather

than being autonomous, learning must be understood to be "the product of a collaborative

construction of understanding" (Vygotsky cited in Billett, 1994, p. 7) in correspondence with

"socio-culturally evolved means of mediation and modes of activity" (Vygotsky cited in Harley,

1993, p. 47). Furthermore, as higher levels of development are reached, cultural tools and signs

(whose epitome is speech), aid in establishing social interaction (Vygotsky, 1981). Thus, as human

development and interchange are dependent upon the use and understanding of cultural artifacts, at

least some aspect of schooling must be contextualized to enable the learner the greatest opportunity

for meaning making, either about a particular community or about society as a whole.

Central to the emphasis on interactive learning is the idea of "zone of proximal development"

or "the distance between the actual developmental level as determined through independent problem

solving and the level of potential development as determined through problem solving under adult

guidance or in collaboration with more capable peers" (Vygotsky cited in Tudge, 1990, p. 157). As

summarized by Vygotsky's student and collaborator, "childrens' participation in cultural activities

with the guidance of more skilled partners allows children to internalize the tools for thinking and for taking more mature approaches to problem solving" (Leont'ev cited in Rogoff, 1990, p. 11). Thus, besides learning having to be socially embedded, it is dependent upon a specific teaching-learning relationship in which one partner is able to offer expertise and assistance to the other(s). In this way, not only is learning an attempt to understand and solve the problems situated within and posed by the institutions, artifacts, and norms of society, but, just as importantly, it is a cooperative venture.

Although Vygotsky highlighted the social context of learning, he understood the need for a corresponding theoretical foundation as well. By differentiating between scientific concepts (those learned in a formal situation) and everyday concepts (learned informally) he theorized there are two types of mutually constitutive and interactive learning:

> Both types of concepts are not encapsulated in the child's consciousness, are not separated from one another by an impermeable barrier, do not flow along two isolated channels, but are in the process of continual, unceasing interaction, which has to lean inevitably to a situation where generalizations, which have a higher structure and which are peculiar to academic concepts, should be able to elicit change in the structure of spontaneous concepts. (Vygotsky, 1994a, p. 365)

In other words, classroom and in situ learning are not just complementary, but actually reconceptualize each other. For example, through language study in school, children develop the capacity to consciously manipulate the symbolic system, while in the world beyond the school walls, these symbol acquire meaning as "school knowledge grows into the analysis of everyday" (Vygotsky cited in Moll, 1990, p. 10). Reciprocally, everyday meaning of language is transformed through interaction with the schooled concepts. Thus, comprehensive learning occurs when the scientific and everyday work in concert through a transference between contexts.

Finally, Vygotsky also saw situated learning as enabling development from lower to higher orders of cognition. Based upon the proposition that "social relations or relations among people genetically underlie all higher functions and their relationships" (Vygotsky cited in Wertsch & Smolka, 1993, p. 71), he posited "any higher function necessarily goes through an external stage in its development because it is initially a social function" (Vygotsky, 1981, p. 162). For example, a

child first must be able to physically experience a sign for the number three (through the social mediation of the raising of three fingers) before being able to conceptualize the number itself.

Correspondingly, Vygotsky also felt that as socially distributed cognitive systems are more successful than a single person attempting to perform a number of parallel tasks, humans working in collaboration have the potential to integrate their cognitive abilities into one which surpasses its individual parts. In other words, the highest levels of development must be social, or as Edwin Hutchins (1993) states during his previously mentioned study, "because society has a different architecture and different communication properties than the individual mind, it is possible that there are interpsychological functions that cannot ever be internalized by any individual" (p. 60).

Present Interpretations of Situated Learning

Vygotsky's work in social psychology and contextualized learning sets the foundation for situated learning's part in the present growing interest in the possible restructuring of formal education and workplace learning. Though there is both a general unawareness and/or candid resistance to his central ideas, nonetheless, they are being revitalized due to the growing tendency which views "human mental functioning in terms of an aggregate of skills or an aggregate of contextually situated processes" (Wertsch, 1990, p. 111). Attesting to this new interest is the burgeoning number of works addressing the likes of situated learning, situated cognition, and other related concepts. It is to these this review now turns.

The one piece of scholarship which might be held the most responsible for rekindling Western interest in situated learning is Lave and Wenger's (1991) ethnographic investigation of five traditional and nontraditional apprenticeships in Mexico, Liberia, and the United States. Emphasizing apprenticeship's diversity of historical forms, cultural traditions, and modes of production in order "to show how learning or failure to learn in each of our examples of apprenticeship may be accounted for by underlying relations of legitimate peripheral participation" (p. 63), their purpose, in other words, is to examine the relationship between learning, contextualization, and the changing roles of novice and experts within communities of practice. Besides reinforcing the basic proposition that "understanding and experience are in constant

interaction-indeed are mutually constitutive" (p. 52), Lave and Wenger add an analysis of the dialectic relationship between learning, activity, and setting. That is, they propose that not only do learners and teachers change through the activity of learning but so, too, do "communities of practice" reproduce and change as cultural novices slowly move from the periphery to the centre of society and eventually replace the experts from whom they have learned. Thus, Lave and Wenger contend that in any given concrete community of practice the historically constructed process of reproduction "must be deciphered in order to understand specific forms of legitimate peripheral participation through time" (p. 57), a motif that Lave emphasizes in later works.

Finally, though they had attempted to steer clear of an analysis of school learning in order "to develop a view of learning that would stand on its own" (p. 40), nonetheless, they do conclude it is insufficient to think about schooling as simply what happens in a classroom. Accordingly, they argue, that because such a large part of learning is dependent upon situated, tacit knowledge and its cultural context, including the use and understanding of cultural artifacts, community participation is a necessity. For, as does Vygotsky, they hypothesize that only through authentic utilization, do these cultural tools become both visible and invisible. Visible, that is, in one's awareness of them, and invisible in our almost unconscious acceptance of their need and use.

Consequently, Lave and Wenger argue that as the most influential cultural tool is language, it is instrumental that any learning be steeped in the language of the practice itself. As epitomized by the institutionalized setting of schooling, "the didactic use of language, not itself the discourse of practice, creates a new linguistic practice which has an existence of its own" (p. 108). In other words, as there is a difference between talking about and talking within a practice, schooled and decontextualized learning cannot help but result in the appropriation of two different sets of meanings.

Yrjo Engestrom, beginning with his doctoral dissertation, continues to be another important contributor to situated learning theory and practice. Concerned with the relationships between learning and work and school, Engestrom's studies have focused mainly upon learning as part of an activity system, a historical incorporation of "both the object-oriented productive aspect and the

person-oriented communicative aspect of the human conduct" (Engestrom, 1990, p. 79). In this regard, his study of doctors and their patients suggests the inherent contradiction between the system and personal views typified by each of these contrasting perspectives is responsible for systemic re-creation as new artifacts are fabricated and accepted during negotiation (Engestrom, 1993). In other words, not only are relations between humans and context foundational for learning, but also it is through these interactions "the arenas of our everyday life. . . are constructed by humans" (p. 78).

Thereupon, Engestrom has characterized learning as a collaborative, socio-historic process of internalization and creation:

> Learning is meaningful construction and creative use of intelligent cognitive tools, both internal mental models and external instruments. Learning is also participation, collaboration and dialogue in communities of practice. Finally, learning is also criticism of the given, as well as innovation and creation of new ideas, artifacts and forms of practice. (Engestrom, 1994, p. 1)

Thus, terming the highest order of learning investigative, Engestrom suggests that organization of content, advancement through the learning process, social interaction, and proper motivation, particularly that arising from the challenge of conflicts, dilemmas and anomalies, enable the learner to pause "in order to reflect upon the problem and formulate a hypothetical explanation of the principles behind successful solutions" (p. 17). That is, like other proponents of situated learning, Engestrom suggests we gain knowledge of the world by dealing with the world.

Also contributing to the contemporary interpretation of situated learning is the Australian, Hugh Billet. His two ethnographic studies, for example, found that skilled workers from a variety of vocations "valued learning in the workplace because of the qualities of agency and activity, the guidance of experts and the authentic nature of learning activities" (Billett, 1994, p. 4). Citing, first, his interviews with coal miners, he states the miners thought "for learning processes to be effective, they had to be pertinent to the activities, culture and social relations within the mine site" (p. 4). Correspondingly, he goes on to say, "anecdotal information provided about changes to equipment design being made on the advice of mine site workers [as opposed to external expertise] seemed to support such a claim" (p. 5).

Moving to a more comprehensive investigation, Billet then surveyed and interviewed a wide range of skilled workers in retail, secondary processing, transport, and hospitality industries. As with the first study, the workers verbalized "strong support for learning situated in the workplace" (p. 5). Additionally, however, not only did each worker report that engagement in higher-order problem solving activities as a part of their work was common but also "the ability to undertake higher order cognitive activity had been developed in the workplace" (p. 6). In other words, besides being context specific, situated learning seemed to "promote robust and transferable knowledge and skills, . . . an enduring goal of educational practice" (p. 4).

So, too, does the emphasis on the significance of interplay between learning, activity, authenticity, and social context find support in certain studies into the psychology of personality development. Specifically, "activity theory" (Hacker, 1985) and "action regulation theory" (Volpert, 1989) both suggest there is a direct relationship between worker participation in the establishment and attainment of higher level, work-oriented goals, and individual learning improvement and personality enhancement. With the work task recognized as "the point of intersection between organization and individual" (p. 223), it has been found the greater the degree of workplace involvement and responsibility, the more extensive a worker's cognitive development, feelings of personal agency, and desire for increased social participation and responsibility. Thus, extrapolated to the educational setting where studies can be seen to be analogous to work, further support is added to the argument that when students (workers) are allowed authentic and meaningful involvement in the content and process of their studies (work), they not only learn more but also are better able to participate in the creation of their work and life-meanings.

Situated Learning, Context, and the Individual

Important recent thought on situated learning concerns itself with the meaning and significance of context and the individual, and their relationship in the learning process. As Kirschner and Whitson (1997) suggest, the "notion of the individual in situated cognition theory needs to be fundamentally reformulated" (p. 9). Although this perspective is relevant to my thesis' identification of different learning contexts and outcomes, an in-depth analysis of the context-

individual relationship is beyond the parameters of the investigation. Hence, the following discussion is intended mainly to better inform the reader of new developments in the field, to help articulate the limits of this project, and, in turn, introduce possibilities for future study. I begin with a recent work of Jean Lave, and then move on to other missives by Lave and Wenger, Engestrom and Cole, Walkerdine, and Billet.

Lave (1993) states "little attention has been given to the difficult task of conceptualizing relations between persons acting and the social world. Nor has their been sufficient attention to rethinking the social world of activity in relational terms. Together, these constitute the problem of context" (p. 5). Generally, then, Lave's main concern is that as situated learning's main defining feature is the learner's situatedness, any thorough understanding is incumbent upon an analysis of this relationship. Unfortunately, she goes on, this has been left relatively unattended. Rectification, Lave posits, begins with awareness of the two competing general frameworks of context. The structural position, where she places herself, explains relations between persons engaged in socio-culturally constructed activity and the world as being historically related. Termed activity theory, this perspective contends that activity systems are contexts which "may be seen as the historically constituted concrete relations within and between situations" (p.18).[4] Specifically related to public schooling in Canada, today's context might be said to be primarily determined by approximately 150 years of history begun as an attempt to establish a relationship between church and school (Manzer, 1994).

The competing perspective, a phenomenological approach, views context as "an order of behaviour of which one is a part" (McDermott cited in Lave, 1993, p. 18). In other words, rather

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4. Activity theory, as first formulated by Soviet Psychologists, is predicated upon the following:
a) Activity is analyzed at various levels: 1) activities which are distinguished on the basis of their motive and the object toward which they are oriented, 2) actions which are distinguished on the basis of basis of their goals, and 3) operations which are distinguished on the basis of on the conditions under which they are carried out.
b) It involves the notions of goal and goal-directedness.
c) Activity is mediated (sign systems).
d) Emphasis on developmental or genetic explanation.
e) Human activity and means that mediate it have arisen through social interaction.
f) Internalization: activities are originally carried out by the child on the external plane and then internalized (Wertsch, 1981).

than being a function of history, situations are fluid and self-determining as "people organize themselves to attend to and give meaning to figural concerns against the ground of ongoing social interaction" (p. 19). Returning to our example of public schooling, context would be determined by the involved teachers and learners and their feelings about and reactions to the specific social situation in which they find themselves, and simultaneously help determine. As relating to my investigation, the hospital learning environment, for example, would be said to better defined in terms of students' experiences at the time, rather than what might have happened there in the past.

Born from this consideration of context, Lave (1977) has arrived at a more detailed analysis of its tripartite affiliation with the learner and the activity. She posits the relationship to be dialectical; for, as these entities interact with one another they are so changed over time that it is impossible to give an account of one except in terms of the others. In this respect, learning takes on a new dimension. Rather than being related to appropriation, it is more accurately depicted as a process of internalization and creation. Thus, "the idea of learning as cognitive acquisition-whether of facts, knowledge, problem-solving, or metacognitive skills-seem to dissolve when learning is conceived as the construction of present versions of past experience for several persons acting together" (Lave, 1993, p. 8). In other words, learning has more to do with a collective synthesis and origination of present and past encounters and contexts than the individualized commandeering of particular packets of decontextualized truths.

As a result, in-school learning tends to be problematic. While authentic learning is characterized by a bottom up process in which "it is the specific character of action-impelling conflicts that generally determines which of several problems lurking in a situation needs to be solved" (Lave, 1997, p. 26), school learning tends to be top down. Thus, while communities of practice see a particular solution as part of a greater context of needs, in school the solution, itself, becomes the endpoint of action. In other words, mandated and tacit learning differ because individual students reconceptualize the problem mainly in terms of marks rather than a problem to be solved (Saljo & Wyndhamn, 1993). Consequently, whereas situated learning is characterized by the ability to act on the basis on understanding, educational research conversely suggests "it is a

painful fact of educational life that knowledge gained in school too often does not transfer to the ability to act competently in more worldly settings" (St. Julien, 1997, p. 261). As a result, rather than being a specification of practice, curriculum must become an "arrangement of opportunities for practice" (Lave, 1997, p. 32).

Lave and Wenger (1996) make a more specific distinction between the description of learning as either an appropriation or internalization. Appropriation, they suggest, connotes "the individualistic acquisition of the cultural given" (p. 144), while internalization through situatedness finds manifestation in dialectical change, and thus the creation of new knowledge and self identity. Thereupon, arguing that Vygotsky's conception of the zone of proximal development is metaphoric of appropriation, they offer support for Engestrom's newer collectivist definition that the zone of proximal development is the "distance between the everyday actions of individuals and historically new forms of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in everyday actions" (Engestrom, 1987, p. 174). This perspective, they suggest, better emphasizes the interdependency of world and agent, the social character of actions and thought, and the open endedness of a socially constituted world.

As with Lave and Wenger, Engestrom's and Cole's (1997) recent work, in its focus on the need for a new agenda for situated learning, is emphatic about the need to understand and define context. In this way, they attempt to help direct research so as to deal with the "Pandora's box that offers a rich variety of interpretations, possibilities, and dangers" about situatedness (p. 301). All of the three sets of themes which they offer as particularly necessary of further investigation in any study of situated learning (the unit of analysis, multiplicity of contexts and boundaries between them, the role of time and the meaning of development with respect to cognition embedded in practice, and rebellion and creation of new meanings and artifacts), are directly related to context. Thereupon, while reviewing the positions of others on these facets of situated learning, Engestom and Cole also offer own interpretation. Although they indicate their favourite perspectives on the matter, their main purpose is to "point out some alternative interpretations and their consequences" (p. 302).

Walkerdine's (1997) understanding of the role of semiotics offers a phenomenological

interpretation of situated learning and context which proposes an end to the practice-cognition dualism. Though this proposition, arguably, suggests my research is misdirected, I include her analysis because of the possibility that it might offer explanation for certain of my findings which "do not fit." For example, as will be elaborated upon in later chapters, one surprising revelation of my study was that all of the four young female students who took part in this investigation were involved in unusual (project related) situations. As such, although my analytical lens sufficed to determine outcomes of learning, it could not help come to terms with this anomaly. Instead, I found Walkerdine's perspective offered more potential in this matter.

Rather than the historical model, Walkerdine bases her analysis on the Foucaultian idea of the production of truth being a function of human mediations and often unconsciously contrived power relations running throughout society (Foucault, 1984). In this light, in place of Lave's argument in which in and out-of-school learning compete to instill contrasting ideologies of truth, as per the social stratification of society, she argues they produce different discourses. It is these discursive practices, then, in their different significations for the same signs, that account for divergent, culturally accepted meanings. It is not a matter of right and wrong, but the accompanying emotional alienation that results from one's being labelled as deviant due to construction by a set of discourses other than those dominant in any particular situation. In other words, she attributes this alienation to schooling's arrangement "for students to develop emotional investment in the forms of activity and of subjectivity within which the normative child can be discursively produced" (Agre, 1997, p. 78). While Walkerdine agrees that non-situated learning results in the encouragement of an unfortunate relationship with reality (the non-school world) due to the construction of artificial problems amenable to wholly abstract treatment, she objects to the identification of faulty reasoning as the cause. Such a perspective, she argues, continues the promotion of a nonexistent practivity-cognition dualism. Accordingly, Walkerdine might argue my investigation is not only irrelevant but dangerous in its asking of the wrong questions and resulting promulgation of a particular educational approach for all. Instead, she contends we should be analyzing specific contexts, not as facilitators of learning but rather as producers of subjects.

Billet's (1996) most current work, a theoretical attempt to alleviate the dichotomy between the cognitive and socio-historical perspectives on learning, looks to identify the cognitive consequences of social circumstances. Based upon the idea "goal-directed activity promotes the psychological functions of the learner [he suggests] as individuals engage in goal-directed activities, they access, manipulate and transform cognitive structures which are socially sourced resulting in construction and organization of knowledge" (p. 271). By comparing six complementary areas between the external and internal facets of learning, classified as means of appropriation and products of appropriation respectively, Billet attempts to develop a structural framework by which to correlate specific learning outcomes with particular social circumstances. This, he suggests, will provide "a basis for understanding thinking and acting which they could not achieve on their own" (p. 277). I suggest in light of Wertsch's (1985) previously mentioned critique of Vygotsky's insufficient exploration of natural development and unidirectional transformation, Billet's argument seems to present one starting point for such an analysis. In regard to my inquiry, this approach could prove useful in helping to decipher the relationship between context and learner responses, and resultant learning.

<center>Transfer of Situated Learning</center>

The facilitation of transference is a requirement of any successful theory of learning. Traditional empiricist and rational accounts hypothesize, for example, that transference is manifest primarily through "symbolic cognitive representations that are learned in one situation and applied in another" (Greeno, Moore, Smith & The Institute for Research on Learning, 1993, p. 145). Thus, the more abstract and generalizable the learning, the greater the possibility of transference to varied contexts. In opposition to this more traditional accounting of transference, Greeno and others refer to the findings of a meta-analysis of a number of cognitive studies to conclude that because transfer appeared to depend upon "direct perception to an account" (p. 146), situated learning is also conducive to transference. Additionally, they state that because knowing "is not an invariant property of an individual [but rather] is relative to situations" (p. 99), symbolic mediation may actually hamper transference in certain situations. In a later paper, Greeno (1997) remarks that

successful transference of situated learning is dependent upon "how the learner was attuned to constraints and affordances in the initial learning activity" (p. 12). In summary, then, it might be argued the position of Greeno and others suggests transference to another setting is more easily facilitated by direct comparison of the two contexts because instead of having to interject another level of "bureaucracy," that of a symbolic representation of the learned moment in both the old and new situations, the learner compares only the moments themselves.

Similarly, Choi and Hannafin (1995) argue situated learning's reliance upon real-life settings facilitates transfer more efficiently than the relatively impoverished formal learning contexts associated with institutionalized learning. They assert, transfer is best enabled when learners are allowed access to general situations in which there is plenty of opportunity to practice in multiple settings. In this manner, then, "domain experts acquire the ability to discriminate among subtle features by virtue of experience across a wide range of situations that provide relevant contrasts" (p. 59). In other words, they also argue transference results from recognition and comparison of concrete events rather than abstract conceptualizations.

<div style="text-align:center">Transfer and Cognitive Apprenticeship</div>

Meanwhile, acknowledging transference to be a problematic aspect of in situ learning, Collins, Brown, and Newman (1989), and Brown, Collins and Duguid (1989), widen the parameters of the situated learning paradigm. Resonant with Vygotsky's distinction between the scientific and everyday, they argue that because there is little integration between real world problem-solving needs, and abstract, in-school learning, "conceptual and problem solving knowledge remains largely unintegrated or inert for many students . . . [and thus] to make a real difference in students' skill, we need both to understand the nature of expert practice and to devise methods appropriate to learning that practice" (Collins et al., 1989, p. 455). Thereupon, they conceptualize "situated cognition" or "cognitive apprenticeship" as the model by which to eliminate this dichotomy. Derived from traditional apprenticeship incorporating observation, scaffolding, and growing independence, situated cognition is characterized as the "externalization of processes that are usually carried out internally . . . [and thus made] readily available to both student and teacher for

observation, comment, refinement and correction" (p. 457). Thus, in a formal setting, the student first gains an understanding of the abstract generalizable principles needed to develop the global framework necessary for the organization of knowledge and transfer of learning to an authentic situation. In other words, "cognitive apprenticeship supports learning in a domain by enabling students to acquire, develop, and use cognitive tools in authentic domain activity" (Brown et al., 1989, p. 39). Terming these situated cognition activities "goal based scenarios," Collins (1994) suggests there is a relationship between goal-setting, learning, and application:

> You give learners the kind of tasks that you want them to learn to do and you give them the scaffolding that they need to carry out such tasks. Goal-based scenarios make it possible to embed the skills that you want people to learn in the contexts in which they are to be used. So they learn not only what to do, but when and how to apply their knowledge. (p. 30)

Specifically, they describe this as a tripartite process in which "teachers or coaches promote learning by making explicit their tacit knowledge or by modelling their strategies in authentic activity . . . teachers and colleagues support student's attempts at doing the task . . . [and teachers] empower the students to continue independently" (Brown et al., 1989, p. 39).

In summary, then, basic to the development and continuing interpretation of situated learning, is the argument that learning is primarily a function of social context. So, too, is it asserted that either through direct comparison between contexts and/or through the utilization of cognitive apprenticeship, this learning can be abstracted to higher cognitive levels and transferred to different environments. These contentions are resonant with my thesis statement that the nature of the ITM students' learning is related to its context, and to one of my conclusions that many of the ensuing learning outcomes appear to be transferable to a variety of environments.

Critiques of Situated Learning Transference Models

Situated learning transference models are not without their detractors. Besides the general, relatively undeveloped contention that situated learning simply does not promote transfer from one context to another (Tripp, 1993), more specific and better articulated concerns are directed toward the supposed lack of development and transfer of higher order thinking. Bereiter (1997), for example, argues when the necessary information can be indexed and understood in terms of rules,

situated cognition works, but in regard to more creative and abstract pattern recognition, it does not allow for the associative retrieval of patterns which result in the grasping of analogies and metaphors.

Furthermore, although Bereiter acknowledges Greeno, Smith, and Moore's (1993) contention that transfer across settings results from the recognition of similar constraints or affordances, he also argues situated learning fails to account for the pursuit and development of "knowledge building goals" which are only weakly connected to the immediate situation. In other words, situated cognition adequately explains learning and transference regarding the transformation of the physical environment and acquisition of specific expertise therein, but it does not allow for the origination of a new world of immaterial objects and/or the development of related skills. The problems associated with space travel, he contends, could never have been mastered solely through reliance on situated learning. This argument finds correspondence with the position of Anderson, Reder, & Simon (1996) that situated learning may not be transferable because knowledge is often tightly tied to its context, and "transfer between tasks is a function of the degree to which the tasks share cognitive elements" (p. 6).

In a similar vein, Prawat (1993) argues situated learning enables the development and transfer of procedural but not propositional knowledge. Thus, though the emphasis on learning as a problem-solving activity is relevant, it is overdone and results in the highlighting of the instrumental nature of learning. Through its disregard for creation, imagination, and the role of insights, he suggests, situated learning fails to "account very well for the equally important process of accommodation which involves a transformative as opposed to informative relationship to the world" (p. 5). Prawat's argument finds commonality with the preceding positions in their argument that situated learning is not abstract enough to be transferable to non-context related conceptualizations.

<div align="center">Other Critiques of Situated Learning</div>

Situated learning is also subject to a variety of other criticisms, with Tripp's (1993) attack being most foundational. Predicating his position on the belief that regardless of circumstance and

social context there are "true ideas" that must be maintained, he contends that by allowing teachers to slip from role of expert to facilitator, learners fall pray to the influence of common everyday knowledge: partial truths and lies. According to this argument, the place of tradition and community is not to allow learners to create their own interpretations but to teach the correct way of behaving. In turn, he posits proponents of situated learning are narcissistic in their belief that by knowing what is "best" for students they are able to liberate them from the traditional, oppressive educational practices.

Tripp continues that even if there was a case to be made for situated learning, it is unworkable because the world is much too complex to be subject to interpretation through physical activity, apprenticeship learning is not transferable, and theory must always precede practical knowledge. Or, as presented by Anderson, Reder, and Simon (1996), "because it is better to train independent parts of a task separately because fewer cognitive resources will then be required for performance, thereby reserving adequate capacity for learning" (p. 9), situated learning cannot justify its claims that one of the most problematic aspects of traditional learning is its reliance on abstraction. In other words, they counter that the complexity of social situations often interferes with learning, rather than visa versa.

Meanwhile, Tripp adds a final perspective in his contention that because communities and practitioners are subject to fossilization and the resulting perpetuation of improper practices, they are not capable of assuming a reliable teaching role. Thus, he states it is teacher's task to teach (not facilitate), and model correct ideas and actions. Emphatically, he concludes that as traditional ways of teaching have always done a proper job, there is no reason to change now. In total, then, his arguments might be paraphrased to suggest that even if there were a need for new teaching methods, situated learning does not offer any hope in this regard.

Hay (1993), too, sees situated learning as being highly suspect. He agrees with Tripp that some communities are not educationally worthy because they may be sectarian or dictatorial, or in a number of other ways exploitive. Additionally, as novices generally have neither agency nor space to create knowledge within a community until they are so coloured by their experiences, any

awareness of the need for change is extraordinary. Finally, Hay thinks of situated learning as being, ironically, self-contradictory because its project to create the "educated man" de-centres the student.

Winn (1994) understands situated learning as problematic mainly because of its emphasis on expertization. He contends that although learners often prize the acquisition of a wide variety of skills and cursory knowledge, situated learning's intensity and devotion to a particular cause makes this impossible. As a result, learners are often forced into making unwanted decisions resulting in the unnecessary exclusion of other possible aspects of life. Moreover, he also feels situated learning's lack of "teaching" is irresponsible because it is a teacher's task to make a subject "accessible and comprehensible to students" (p. 12), not simply to leave it up to the students to fend for themselves. Winn goes on to conclude because situated learning must operate without a plan, due to its intuitiveness and contextuality, it is no substitute for the proven traditional methods.

Finally Damarin (1994), a strong proponent of the emancipatory potential of situated learning, warns of the dangers of perpetuating false dichotomies. That is, although she values situated learning's potential to equalize educational and socioeconomic opportunities, it is too easy, she says, to continue to recognize a distinction between expert and common knowledge, and thus continue the divisions and inadequacies experienced by "just plain folks." In other words, it is imperative that policy makers and practitioners need to understand that because various epistemologies are characterized by lateral rather than hierarchical distinctions, learners must be encouraged to give equal recognition to all forms of knowledge.

In summary, the critique of situated learning can be characterized as being both substantive and formative. As epitomized by Tripp (1993), the substantive path goes to the very heart of epistemology. Learning, knowledge and truth, being understood as ahistorical and non-contextual, are not something which can be created but can only be passed on from knower to learner. Obviously situated learning, in its emphasis on the role of the learner in the production of socio-cultural forms of knowledge, has no place in this model of the universe. On the other hand, formative criticisms, if not accepting all of the tenets and methodologies of situated learning, are at

least open to an investigation of its potentialities. Thus, the worries of Hay regarding the desirability of certain learning communities, and Damarin over the perpetuation of particular forms of hegemony can be accommodated within the situated learning process. Certainly, the findings of my investigation argue that proper learning communities are a necessity.

Perhaps, most problematic among proponents and opponents alike, are the concerns about transference. However as the process of learning-transfer remains a theoretical issue, it might be argued that the aforementioned works of Collins, Brown & Newman (1989), Brown, Collins, & Duguid (1989), Greeno et al. (1993), Billett (1994), and Choi (1995) suggest situated learning has as much right to claim the realization of transference as competing hypotheses. At the very least, the relationship between learning-transference and situated learning is worthy of continued examination, as the findings of this study, for example, seem to suggest.

Situated Learning and Technology

Because of the changing nature of education, there are multiple assertions of the growing need for utilization of the mutually beneficial relationship between technology and situated learning. For, as "it is impossible for students to serve apprenticeships acquiring all of the survival skills they will need for the 21st century" (Jonassen, 1995, p. 60), McLellan (1994) contends not only will telecommunication facilitate contact between school and the immediate community, but technology can provide a surrogate for the world at large. Similarly, Jones (1995) argues that as telecommunication continues to transform the conception of community, it will be increasingly important to account for the social as well as the physical nature of situatedness (Brown & Duguid, 1993). That is, with learning communities no longer circumscribed only by physical proximity, situatedness may become as much a matter of cyberspace as space, with situated learning potentially manifest anywhere that computer users can interact.

Theoretical support for this juxtaposition is provided through presupposition of a convergence of the classroom and workplace. For example, Schlager, Poirier & Means (1996) suggest that electronic mentoring serves as the means to help narrow this gap between the two worlds:

> The practices of the community and the social and technical competencies required to participate in those practices constitute an implicit curriculum . . . [and] knowledge acquisition is embedded in a multi-level dialogue between the learner and more experienced co-workers who share the goal of improving the learner's task performance. (p. 244).

They add, through the use of the Internet to connect mentors and learners, it is possible "to bring the outside world in," while still conforming to the dictates of the mentorship model in which "the mentor is primarily a practitioner in a subject-matter domain rather than an educator" (p. 248).

Also relevant to this professed relationship between situated learning and technology is the Vygotskian twofold conception of artifact. For as artifacts (in this case, computers) are seen not only as mediating devices (Rogoff, 1990) but also as cultural signifiers (Burgess, 1993), it is imperative all persons become experienced with the mediating potential of computers and attempt to understand their multiplicity of cultural signification roles. Moreover, because many young people tend to be more computer literate than older generations, it makes sense to utilize their expertise for the good of the whole community. In turn, this community participation will enable these younger persons a better sense of social and cultural context.

Lemke's (1997) ecosystem model in which the units of learning are identified as "persons in activity" offers another interpretation of the relationship between situated learning and technology. Positing that learning is dependent upon intersecting patterns of membership in multiple communities, he suggests "much of the creative capacity of our society is vested in the capability of individuals to connect networks not usually connected" (p. 53). In this light, he adds, that as this capability is greater among the young who are not yet tied into networks, "perhaps, for at least some students, the networks being created by new information technologies will allow them to escape or bypass these restrictions to a greater degree" (p. 54). In other words, like Bryson and De Castell (1994), Lemke seems to see technology as a means of breaking free of old limitations and encouraging new narratives about learning.

Particularly explicit support for the relationship between situated learning and technology comes from McLelland (1996), editor of Educational Technology. In her understanding, she includes technology as "another consideration in the situated learning model because technology

expands the power and flexibility of the resources that can be deployed to support the various components of situated learning" (p. 12). In this regard, she proposes a model of situated learning which includes 1) stories for the transformation of information and discoveries, 2) reflection, 3) cognitive apprenticeship, 4) collaboration, 5) coaching, 6) multiple practice, 7) and the articulation of learning skills, all tied together through 8) technology. In other words, McLelland sees technology as being a significant catalyst of situated learning in various contexts.

In conclusion, it must be emphasized that there are important differences between the use of educational technology within traditional paradigms, and as a constituent of a situated learning process highlighting educational change. As such, it is necessary that policy makers and practitioners remain aware of this distinction in order that technology's potential be fully realized (Schofield, 1995). In this regard, situated learning, as one component of a possible new educational model, demands an application of technology that directs and foregrounds a wider and deeper communication between the school, immediate community, and world at large than has generally been the case. In other words, while it is possible to utilize technology to do little more than complement traditional practices such as the teaching of keyboarding, it is only through more progressive measures such as those associated with situated learning that education as a whole can be revitalized.

<center>Educational Applications of Situated Learning</center>

In concert with the growing theoretical and work-oriented support for situated learning, a number of educators have begun to examine and explicitly describe its potential for schooling. Highlighted among these analyses is the general understanding that the implementation of situated learning will necessarily result in the obsolescence of traditional forms of teacher-centered education. It is argued, as connections are built between the classroom and the "real world," and the teacher is no longer the only expert in the classroom, his/her role becomes one of facilitation and guidance (Keedy & Drmacich, 1994), rather than that of "knowledge depositor" (Freire, 1971). Concomitantly, rather than being a receiving vessel and mediated object, the student assumes both a more direct role in the interchange between educational agents, and an authentic

place in a society as a whole.

In a unique bridging of schooling and work, Goldman (1992) extends the basic concept of community of practice by emphasizing the importance of social interchange. Predicated upon situated learning's basic tenet "learning is thought to be participation of members in the practice of a community" (p. 5), and her observations of two physics classrooms in which social, task and procedural, and conceptual worlds of interaction were "interwoven, overlapping and mutually constitutive" (p. 6), she suggests the classroom must encourage "conceptual learning conversations" (p. 5). For, as the "real world" physics community is composed of "ways of talking and acting shared beliefs about what is of interest or import" (p. 5), classroom learning is similarly dependent upon "environments with multiple resources, collaboration, and participation" (p. 7). Simply put, her advice for educators who wish to encourage authentic learning is that they establish a comfortable, interactive environment similar to those characterizing authentic communities of learning and practice beyond the walls of the schoolroom.

From a feminist perspective, Damarin (1993) sees the resulting new teacher role in educational applications of situated learning as that of a metaphorical midwife who co-produces uniquely relevant and appropriate knowledge by helping the learner move between, and learn about different communities. Comparing the difference between travel and tourism to the difference between superficial and in-depth learning, she argues the demands of "world travel provide important insights for the education of those students often marginalized in (some) traditional school learning contexts not only by gender and socio-cultural factors, but also by learning disabilities, prior school failures, attitudinal mismatches, or numerous other factors" (p. 29). Thus, she explains, while the transitory nature of tourism is akin to a type of learning in which students experience a cursory and often patronizing contact with other forms of knowledge, the intensity of travel is analogous to a method of situated learning that demands immersion into, and equal valuation of all knowledge types. The emancipatory potential of situated learning, then, is realized when learners acquire a deep understanding of, and give equal recognition to a multiplicity of communities. In this way, those students who have been oppressed by a predominant ideology will

come to realize their own perspectives and skills are as valuable as all others. In other words, situated learning allows for the possibility of the re-creation of cultural capital in the image of less dominant societal groups (Bourdieu, 1977).

The Cognition and Technology Group at Vanderbilt (1994) also finds the relationship between situated learning and educational change to be significant. Investigating anchored instruction (an educational technique in which video representations of real life situations form the basis of problem-solving scenarios) and situated learning, they found that the introduction into the classroom of real-world applications benefitted students' problem-solving due to what Marton and Booth (1997) would describe as a better experiencing of the phenomenon as a whole. Also concluding that anchored instruction and situated learning lead to better learning and transfer than traditional methods, they suggest the challenge is "to help students generate their own community based projects" (p. 66). Thereupon, they see situated learning as contributing to the demise of the school-work dichotomy.

In a study of the relationship between technology, community, and learning, the Indiana Weather Project (IWP) investigated "how the joint application of situated learning and constructivist theory might support elementary school students' understanding of weather systems" (Bonk, Hay & Fischler, 1996, p. 93). Based upon the American Psychological Association findings that children want learning activities that are meaningful, authentic, respectful, adaptive, and individually appropriate and controllable, an instructional unit on weather in which support was provided through a variety of peer and expert resources including on-line information was developed and monitored (cited in Bonk et al., 1996). Using interviews, observations, and three pre and post-test assessment tools to explore cognitive change during the project, it was found that learning could be improved through student involvement in electronic communities of practice which, in turn, could be developed and supported by the use of technology. Not only was students' understanding of the weather enhanced but simultaneously they become more comfortable in the use of appropriate technology for networking and community building.

Besides educational applications which are directly informed by situated learning, there are

other school-oriented studies in which certain of situated learning's defining qualities (like task authenticity, and student interactivity) are contributive. For example, pre and post test scores from a study on the effects of networking on a grade five writing class indicate "a functional writing environment that allows students to write for authentic audiences will improve the quality of their writing" (Allen & Thompson, 1995). In the same way, a qualitative study using pre and post-project interviews with writing tutors found that on-line mentors can not only provide revision suggestions for students but also, due to the authenticity of the assignment, "expand their own perceptions toward writing" (Duin, Lammers, Mason & Graves, 1994). And finally, there was a unique project in which elementary school students and pre-service teachers who were impersonating fictional characters communicated via the Internet. Qualitative analysis of the text of their electronic messages indicated "Characters Online provided a realistic context for adults . . . and elementary level students [in which] students became equal participants in language learning" (Harris, 1994).

Peer interactivity, another characteristic of situated learning but certainly not exclusive to it, has also garnered attention. Two separate literature searches of quantitative and qualitative research, for example, found there is a direct relationship between various types of groupings and cognitive development (Saxe et al., 1993), and that peer interactivity encourages educational aspirations and achievement, improves cognitive and cooperative development, and promotes higher quality and more creative problem-solving (Johnson, 1981). Concurrently, Riel (1992) surveyed the research into group processes, and succinctly summarized its attributes:

> When teachers shift classroom lessons from whole group instruction to small-group investigations or team projects, there is an improvement in instruction and learning that fosters positive peer interactions and relationships [which in turn have been found to] increase academic skills, improve social skills, aid mainstreaming of handicapped students, reduce ethnic tensions, and increase self-esteem. (p. 477)

Finally, an ethnographic study of school restructuring found that student-teacher collaboration within an authentic-task framework resulted in positive educational outcomes (Keedy & Drmacich, 1994). Informed both by situated-cognition theory and control theory (Glasser cited in Keedy & Drmacich, 1994), researchers used interviews and field observations to conclude that a

collaborative curriculum within a situated learning context was able to "empower students and can address the problem that our schools do little to change power relations between students of elite families and those of minorities and low socioeconomic status" (p. 121). By encouraging student-teacher negotiations and collaborations, promoting community service, and emphasizing student responsibility and problem-solving, the "School Without Walls" was able to raise standardized test scores, lower dropout rates, and alleviate negative consequences of power relations. Though the researchers do not specifically conclude situated learning to be a contributing factor to these socio-educational gains, it appears however, many of its inherent characteristics played a significant role.

<div align="center">Empirical Support for Situated Learning</div>

There is ample scholarship detailing the evolution and present state of the field of situated learning. However, there appears to be a lack of empirical support for the learning claims of situated learning. My exhaustive search of the field revealed only the five following empirical investigations which are all somehow lacking in their ability to give the needed unqualified support. I support this contention with an analysis of work of Engestrom (1990), Lave and Wenger (1991), Billet (1994), Keedy and Drmacich (1994), and Bonk, Hay and Fischler (1996).

One of Engestrom's (1990) projects was to analyze different methods of learning in both school and work settings. The first three papers in the collection attempt to appraise individual conceptual development through an investigation of student perceptions about the phases of the moon, historical change, and dialectical thinking. Finding, through both experimental and qualitative design, that misconceptions are often due to a reliance on contrived sources such as text books and mandated curriculums, the researchers recommend a greater emphasis on instructional techniques more consistent with Vygotsky's "cultural-historical school of psychology" (p. 4) will help to alleviate the problem. For example, one experimentally-designed study monitored changes in learning and concluded application of nontraditional methodologies resulted in new "ways of [students'] approaching historical text" (p. 44). However, empirical support for situated learning per se is tentative, at best, due to the study's reliance upon both a contrived problem and setting, and

resulting disregard for situated learning's need for authentic context and task. The other two papers in this first section, because their analysis of the relationship between the development of personal misconceptions and the reliance on contrived resources ignore learning per se, similarly offer little evidence for learning in an authentic situated learning context.

The second set of studies within the collection, all ethnographic analyses within the context of the medical profession, endeavours to investigate different aspects of the work of practitioners. Rather than tracking any type of learning or skill development, the intent of this investigation is simply to offer an understanding of the profession in terms of activity theory, including relationships between doctors and patients. Specifically, it was found that misperceptions between physicians and their patients were often attributable to the differences between tacit and formal understandings inherent in social context, including those engendered by the multiple role of tools as cultural artifacts and meaning-givers. For example, a medical report can be seen by the doctor as simply an objective tool to convey information, but by the patient as a personal communication about his/her well being. Thus, even though the researchers concluded "that it is becoming increasingly clear to cognitive scientists that learning is above all a question of the contextualization of concepts and skills to be acquired" (p. 194), there never was an attempt to precisely determine what skills and knowledge were acquired. Hence, because these studies do not speak to the specific learning outcomes of situated learning, they have little to offer the search for the necessary empirical support.

Perhaps the most influential of all situated learning studies is Lave and Wenger's (1991) review and examination of five ethnographies (four of which are based upon earlier studies of other researchers) of culturally and historically varied apprenticeships. As previously discussed, they emphasized apprenticeship's diversity of historical forms, cultural traditions, and modes of production in order "to show how learning or failure to learn in each of our examples of apprenticeship may be accounted for by underlying relations of legitimate peripheral participation" (p. 63). Examples of these analyses include the following four accounts of learning: 1) "as time goes on, the apprentice [Yucatec midwife] takes over more and more of the work load" (p. 69); 2)

"apprentices [Goa tailors] first learn to make hats and drawers" (p. 71); 3) "the task for the novice [quartermaster] is to learn to organize his own behaviour" (p. 74), and 4) "she [a member of Alcoholics Anonymous] comes to understand herself as non-drinking alcoholic, and to reinterpret her life as evidence" (p. 84).[5] Although, these statements are indicative of learning, for the following reasons they are problematic in their ability to provide unqualified empirical support for the learning claims of situated learning. First, only one of the apprenticeships reported upon was a first hand account, the others were based upon previous studies. Although this in itself is not necessarily problematic, the fact Lave and Wenger give very little description of methodology and context of these previous studies raises certain concerns regarding reliability. Second, each of their five accounts tends to be more a description of the apprenticeships, than a depiction of learning. As such, for each of these cases only one or two examples of learning are presented which, as seen in the description of the Yucatec midwife, tend to be relatively general. Although presenting a brilliant analysis of apprenticeship and situated learning, Lave and Wenger identify few specific learning outcomes of the situated learners. Finally, as none of the accounts mention any form of triangulation or other means of ensuring internal reliability, in each of these cases we have to rely on a solitary interpretation of the effects on learning.

The third set of investigations which I offer as evidence are Billet's (1994) two previously mentioned Australian ethnographic studies that found skilled workers from a variety of vocations "valued learning in the workplace because of the qualities of agency and activity: the guidance of experts and the authentic nature of learning activities" (p. 4). Citing first his interviews with coal miners, Billet states the miners thought "for learning processes to be effective, they had to be pertinent to the activities, culture and social relations within the mine site" (p. 4). Correspondingly, he concludes, "anecdotal information provided about changes to equipment design being made on the advice on mine site workers [as opposed to external expertise] seemed to support such a claim" (p. 5). As with preceding examples, however, there is once again failure to articulate what specific

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5. I take one example from each of the four (out of five) apprenticeships which Lave and Wenger consider to have demonstrated successful learning experiences.

skill improvements might have enabled the workers to accomplish such an undertaking. For example, it would be appropriate to note if they developed or refined their verbal and/or graphic skills in order to specify design details, and/or if they improved their mechanical competencies so as to better understand the workings of the equipment. In other words, without reference to particular learning outcomes it is difficult to assess the extent to which learning occurred.

Moving to a more comprehensive investigation, Billet then surveyed and interviewed a wide range of skilled workers in retail, secondary processing, transport, and hospitality industries. As with the first study, the workers verbalized "strong support for learning situated in the workplace" (p. 5). Additionally, however, not only did each worker report that engagement in higher-order problem-solving activities as a part of their work was common but also "the ability to undertake higher order cognitive activity had been developed in the workplace" (p. 6). Unfortunately, however, not only is there no elaboration of these abilities and their results, but also evidence for such an claim is limited to the word of the specific workers. In other words, besides the aforementioned lack of specificity, validity could be compromised by an absence of any kind of triangulated support.

In the only work pertaining directly to high school students, Keedy and Drmacich (1994) investigate the SWW (School Without Walls), a school in which students meet regularly with advisors, use computers on a daily basis, spend several hours a week in writing instruction, participate in the management of school policy, explore life through daily contact with business, government, and community groups, and design and complete major independent senior projects. Based upon data from the City of Rochester's public school's student-outcomes data, it was found that SWW students (60% of whom are from the inner city and 50% are minority students) performed better than other district students on math and verbal Standard Achievement Test scores, and on Regents Competency Tests in reading, mathematics, and writing. So, too, did they have higher attendance rates, lower suspension rates, and greater attendance at post-secondary institutions. Additionally, by comparing professed values of equality of selected teachers with students' perceptions therein (based upon classroom behaviours), it was also determined the

collaborative curriculum provides better "equal opportunity for minority and low-SES students" (p. 131) than the two other nontraditional schools with which it was compared. In conclusion, the researchers suggest of all the attributes of the SWW, "the collaborative curriculum . . . may be the key ingredient, since the students choose the topics and since learning strategies supplement textbooks" (p. 133).

It might be argued that this investigation of the School Without Walls does offer substantial support for situated learning's potential to facilitate learning. Unfortunately, the lack of more than a cursory reference to means of community involvement is troubling. The resulting lack of identification of the degree to which both task and context authenticity are incorporated into the program makes it is impossible to determine their contribution to student learning.

At the same time, what is also potentially significant but seriously unreported is the extent to which this situated learning environment also exemplifies community service learning. Due to the fact the students under study "explore daily life through contact with local business, government, and community action groups" (p. 128), and "teachers and students at the SWW participate in identifying courses, in designing basic essential questions as course frameworks, and in selecting appropriate activities as course content for their extended courses" (p. 128), it can be argued that service did play some role. However, as the exact extent and nature of service learning was not stated, nor was the conceptualization "community service learning" ever referred to, it is difficult to cite this study in support of the community service learning/situated learning amalgam. On the other hand, it might be argued Keedy and Drmacich's findings regarding the expansion of learning outcomes beyond those associated with a generic situated learning environment foreshadow my thesis.

Finally, we have the aforementioned work by Bonk et al. (1996) which provides a unique integration of situated learning and technology in the elementary classroom. Although this investigation's conclusions regarding the development of student higher order thinking skills and confidence in the use of technology (based upon quantitative measures of knowledge structures, and teacher interviews) suggests learning did occur, the ability of these findings to offer unqualified

support for situated learning is problematic for the two following reasons. The first is that while the students did electronically interact with experts and other students to "synthesize and generate knowledge about the weather" (p. 98), they never left their school, never participated in an authentic community of practice, and never had to solve authentic community problems. The second reason that these findings are troublesome is that, according to the researchers, findings may be compromised for the following reasons: 1) there was a fair bit of variability in assessment across the three sites, 2) individual differences in performance between the sites was not analyzed, and 3) students served as their own control.

<p align="center">A Snapshot of the Situated Learning "Classroom"</p>

Generally, the situated learning environment is unique. It is a place of variety where the students' and teachers' activities and interactivities are changing and fluid as all participants look to each other to share, teach, and learn. Sometimes the teacher as expert may be found directing information to the class as whole, but for the most part the learners work alone or in small groups, either in the class or out at their work sites. At the same time, as the learning environment expands beyond the walls of the classroom, a variety of participants may be seen coming and going according to the needs of a multiple of tasks and projects. Within this melange of activities, computers and other telecommunication devices may be integral, though not necessarily always in use.

An immediate observation of the learning environment would indicate each of these groups is working on a unique task. Some might be drawing a schematic diagram or working on a flow chart while others are attending to a report or evaluation. The commonalty running through each of these tasks, though, is an authenticity manifested by a project or "job" for a client situated in the real world, outside the bounds of the classroom. These projects might include, for example, the building of an electronic daytimer for the Math department, layout of a newsletter for a seniors association, or the development of a web-page for the local community centre. More often than not, however, student groups would spend more project-related time at their work site than in the classroom.

Within this scenario, the roles of the teacher bear both similarities and differences to those found in the traditional classroom. There are times for example, when the teacher may interact with the class as a whole, perhaps discussing housekeeping items or general project-oriented skills such as time-management and interviewing procedures. The bulk of his or her time, however, is spent helping groups and individuals meet the demands of their projects, assessing portfolios, facilitating group discussions, and communicating with community based sponsors and clients. In other words, the teacher is more of a facilitator than purveyor of knowledge. In this regard, he or she must be prepared to deal with the demands of clients and the "real world," and be able to relinquish total control of the students' learning.

Student Assessment in the Situated Learning Environment

Neither the traditional norm-based assessment with its foundational premise of the "existence of fixed and measurable characteristics within an individual that develop in an orderly (and predictable) fashion" (Lunt, 1993, p. 148), nor the now more acceptable and pervasive criterion-referenced assessment perform satisfactorily in the situated learning environment. Rather, as appraisal must also include the provision of information about either a learner's learning strategies and/or about the social and interactional features of the learning situation, it is dynamic assessment that is the most appropriate (Lunt, 1993). In its aim to eliminate the dichotomy between learning and evaluation, dynamic assessment finds resonance with situated learning's basis in a "dynamic, continuous ever-emergent assessment of the learning process [whose] goal is to better customize the instruction, adapting and refining instructional strategies to invoke and improve the learner's progress" (McLellan, 1993, p. 39).

Notwithstanding these expectations, Lunt (1993) advises that both quantitative and qualitative methods may sometimes provide credible means of assessing situated learning. Through consideration of 1) the focus (the different ways in which potential for change is being evaluated either by looking at improvement in test scores or looking at the underlying process of learning), 2) the interactions (the degree of guidance needed by the learner), and 3) the target (kinds of skills being considered: domain specific or general cognitive), she suggests it is also possible to

incorporate both dynamic and criterion-based measures. However, Lunt does finally conclude that if one wishes to assume a clinical approach to evaluation emphasizing interaction and teacher sensitivity "to learners emergent cognitive strategies and abilities" (p. 165), then dynamic assessment is the only viable measure.

Dynamic assessment, though having a variety of manifestations, has recently seen a growing reliance on the use of student portfolios: "an assemblage of student's work that is a presentation of in-progress investigative activities and the resulting products of those activities" (Saxe, Gearhart, Note & Paduano, 1993, p. 137). Thus, through a manifold process, teachers (and students) observe and engage each other in dialogue "as students review and organize their portfolio collections . . .become engaged in reflection on what they have come to understand and value these new understandings . . . [and] generate new investigations" (p. 137). Besides portfolio maintenance, analysis, and assessment, additional techniques such as debriefing, video or audio replays, postmortems, co-investigations, abstracted replays, dramatizations, interviews, group discussions, knowledge telling, and problem-solving episodes, also serve not only as a record of process and progress, but also as a focus of motivation and discussion for future directions. In addition to being totally integrated into the learning process, they, too, emphasize reflection and self-assessment (McLellan, 1993).

Conclusion

Situated learning is a multifaceted, evolving paradigm which attributes learning primarily to social rather than individual constructivism. Although it is beginning to receive some recognition, situated learning is yet to garner a significant degree of acknowledgement as a viable teaching and learning philosophy, either in the public schools or academia. In this regard, a greater degree of substantiated empirical support for its learning claims would probably help to encourage situated learning's greater acceptance, so, too, would a more highly visible profile.

This project speaks to these issues. As I have elaborated upon (and will further discuss in the next chapter), situated learning is especially relevant in explaining the learning in community service learning in general, and in the Information Technology Management Curriculum (ITM), in

particular. Thereupon, while there are certain aspects of situated learning to which this investigation does not directly respond, my study of a number of ITM projects offers the opportunity to help afford some of the needed justification for the learning claims of situated learning, while offering insights into new ways in which it (situated learning) might be best instrumentalized. In this regard, positive findings regarding the effects of the educational technology/situated learning amalgam in a high school setting could, conceivably, result in an expansion of instructional processes beyond those now mainly characterizing traditional schooling. In turn, schooling could become more relevant, encompassing, and student centred.

CHAPTER 3: SERVICE LEARNING LITERATURE REVIEW

Introduction

Most generally, community service learning is both an instructional methodology and educational philosophy in which students use their academic expertise to engage in projects aimed at servicing community needs. However, community service learning is also much more than this. As this chapter discusses, it encompasses and is directed by a rich history, a myriad of different definitional understandings, heated methodological/existential debate, the ongoing search for a conceptual foundation, and inconclusive research findings regarding its effects.

Before continuing it must be noted that much of the following contains an American bias. This is the case because community service learning seems mainly an American phenomenon, though as will be discussed, there are signs of its formal advent into Canadian schooling. This is not to say, however, America has a monopoly on community service or there are not various curricular processes in other parts of the world by which education and academics are integrated. Rather, it simply seems to imply the formal development and understanding of community service learning has been directly influenced by a uniquely American perspective on the meaning and need for service. Analysis of the reasons for this is beyond the scope of this paper.

Development of Community Service Learning

The integration of schooling and community is probably the oldest form of teaching and learning. As with the vestiges of many of today's aboriginal societies, prehistoric children learned about life through authentic cultural participation (Stairs, 1995). Inuit boys, for example, mastered caribou and seal hunting by "going out on the land" with their fathers and other family members, rather than by sitting in school and/or studying. At the same time, the expectation they share their catch with community members provided an introduction to the communal aesthetic. In other words, learning and societal betterment (i.e., survival) were inextricably related.

Over the ensuing year, non-aboriginal North America developed its own interpretation of the integration of service and learning. Evolving from the Athenian expectation that all citizens (free men) participate in politics, its earliest manifestation found form in the American colony's volunteer

militia (Barber, 1988; Moskos, 1988). In contrast, in the newly confederated Canada, voluntarism was originally expressed through the provision of services which today would be considered part of the public social safety net (Glenn, 1996). Later such manifestations of the integration of service and education were particularly strong in the Canadian Adult Education movement. For example, at Frontier College educated teachers laboured beside other workers by day, and taught reading and offered counselling services at night (Morrison, 1978). Similarly, teachers and priests from the Coady Institute in Antigonish taught Nova Scotia fisherman about the causes of their impoverishment, and helped them find means of bettering their situation (Coady, 1939).

Meanwhile, a decidedly American vision of the integration of service and learning began to evolve, spurred by James' (1971) essay suggesting American society should incorporate additional structures to provide national commitment and character building through a nonmilitary type of voluntarism (Committee for the Study of National Service, 1979). Eventually, service came to be seen as an "idea which recognizes that individuals can and should contribute to the larger society and that society should be structured to facilitate and encourage that activity" (Sherraden & Eberly, 1982, p. x). Thus, it was argued a "large-scale national service system could simultaneously multiply the labour power available for attacking the nation's social and environmental problems, make the military services both more effective and more representative, and deeply enrich the lives of those who serve" (Danzing & Szanton, 1986, p. ix). And within these parameters, there developed an understanding of a unique role of youth: "[national service] should be organized so as to enable young people to help meet the real economic, social, and educational needs of the nation in the most economical and effective ways" (Committee for the Study of National Service, 1979, p. 2).

From these beginnings, a number of significant controversies played a role in the eventual general acceptance of service as a vehicle for youth, rather than adults. The first of these sets of discussions revolves around the issue of whether national service should be voluntary or compulsory. In this regard, those in favour generally emphasize the relationship between citizen rights and duties while those opposed champion individual rights, constitutional protections, and

free market economies (Evers, 1988; Moskos, 1988). For example, Barry Goldwater, a former American Senator, felt it was unconstitutional to tell people how to spend two to three years of their lives (Committee for the Study of National Service, 1979). Similarly, Danzing & Szanton (1986) argue:

> A mandatory system of service would preempt time and energy now devoted to more valid ends, breach the constitutional prohibition against involuntary servitude, produce intrusive new bureaucracies, cost (perhaps waste) large sums of money, and reverse the precept that a democratic state exists to serve its citizens rather than the other way around. (p. ix-x)

Moreover, it is also contended that the distinction between voluntary and nonvoluntary is artificial in that what is called voluntary can actually be coercive in nature if those who do not volunteer are somehow considered "second class" citizens (Gorham, 1992).

A second debate focuses upon the contention that even if one accepts citizenship rights imply patriotic duty and service to country, the contestable nature of the meaning of citizenship suggests that it cannot be presumed that national service, in its most prevalent forms, inculcates citizenship, because this rests "on the idea that citizenship can be defined or that a definition can be assumed or agreed upon" (Gorham, 1992, p. 14). In other words, until an exact nature of citizenship is commonly accepted, it cannot be presupposed that service to country is necessarily characteristic of the "good citizen."

A final issue about which those involved in community service are cognizant concerns the relationship between voluntarism and paid labour. Specifically, no matter what their orientation in the debate over the meaning and processes of service, all those involved agree volunteers must neither replace nor threaten to displace workers (Danzing & Szanton, 1986). Thus, adult voluntarism is understood to have its limits.

Due to the potential resulting disruptions to the workforce caused by the integration of mature workers, a growing awareness of the difference between adult and youth needs, the often difficult transition between school and work, and a desire to alleviate the unproductive dichotomy between school and the greater society, national service generally came to be seen as best oriented to youth (Moskos, 1988). Correspondingly, in 1979, an American report on national service suggested "to make a healthy transition to childhood, to work out an identity that includes a sense

of citizenship, and to affirm positive social values, young people need to become actively involved in the lives of others and the goals of society" (Committee for the Study of National Service, 1979, p. 87). Thus, while viewing young people as an economic resource, the committee also saw national service as a means for the government to attack certain social problems and to help young people become involved in society while helping them to explore career and work opportunities. Other specific recommendations reported by the committee were those of Margaret Mead, the noted anthropologist, and Willard Wirtz, the United States Secretary of Labour who suggested, respectively, that young women be as integrated as young men into service, and all high school youth get involved in at least 500 hours of service during high school.

Concurrent to the debate culminating in the general understanding that service be geared mainly to the young were a series of events which specifically linked service to learning. First among these were William Kirkpatrick's urging that schooling adopt the project method as its central tool, his concomitant argument learning should take place in settings outside the school to meet community needs, and Columbia University Teacher's College commencement of the Citizen Education Project advocating direct community involvement and participation (Conrad, 1991). Subsequently, the preeminent step in providing conceptual clarity came in 1967 when Robert Sigmon and William Ramsey of the Southern Regional Educational Board coined the term, "service learning" (Giles Jr. & Eyler, 1994). Soon following, during the 1970s, the National Committee on Secondary Education, the Panel on Youth of the President's Science Advisory Committee, and National Panel on High School and Adolescence were among those urging that young people be integrated into the community through service activities (Conrad & Hedin, 1991).

Over the ensuing years, service learning continued to be mainly an American phenomenon with impetus given by the likes of the Campus Outreach Development League (COOL) formed in 1984 to empower students to strengthen America through service, and the Campus Compact of 1985 which brought together college and university presidents to "expand opportunities for public and community service in higher education and to advocate the importance of civic responsibility in student's learning" (Maas Weigert, 1998, p. 5). In 1989, a small advisory group gathered at

Wingspread to create the "Principles of Good Practice for Combing Service and Learning" (Honnet & Poulsen cited in Maas Weigert, 1998, p. 5), and in 1994 the Invisible College was initiated as a gathering place for faculty wanting to combine learning and service in higher education.

Simultaneously, the number of those participating in service learning has been increasing, particularly in the United States. It was found that in 1994, for example, 250, 000 persons in the United States were involved in government funded service learning projects (it was not possible to calculate the number of people involved in non-funded projects) at a total cost of $64 million (Kraft, 1996). Many of those so engaged, it seems, are associated with university programs like the one at Rutgers University which demands community service as a prerequisite for graduation (Barber, 1988).

Meanwhile, though it is difficult to ascertain numbers, it appears service learning is also growing within the public schools system.[6] Kraft (1996) reports, for example, that throughout the 1980s, state and local boards of education and hundreds of school across the country began service learning programs or required community service for graduation. A more recent indication of this growing tend might include a current guide to service learning in the public schools which lists, under its heading "Resources for K-12 Community Service-Learning Program" (Wade, 1997b, p. 335), fifty-one books and reports, twenty-nine curriculum guides, sixty-one journal articles, and nine videos. Similarly, the Internet includes a seemingly endless array of sites devoted specifically to the topic. For example, the "Service Learning Home Page" (Crews, 1993) contains five links to K-12 service learning programs, one of which is the National Service-Learning (K-12 Clearinghouse) Cooperative which, in turn, includes fourteen other links to sites expressly dedicated

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6. In response to my e-mail to the National Service Learning Web Page requesting the number of public school students involved in service learning, I received the following e-mail reply:

> One of the problems with trying to count the numbers of youth involved in community service learning is that there are countless numbers of teachers who have involved their students in "service learning" but have never heard of the term. The opposite is also true, there are many teachers who involve their students in community service, but they do not integrate the service project into the curriculum. Just because students are involved in community service does fit the definitions of Service-Learning [sic]. (Charles Cook, September 14, 1998)

to service learning for youth.

In Canada, although the lack of relevant literature does suggest considerably less interest in the topic, there are a number of programs which might be classified as community service learning. For example, at Coady International Institute (part of St. Francis Xavier University) there is a unique service learning program in which students may travel to a number of developing countries to perform the service component of their course. So, too, across the country, are there are a variety of university internship programs which in the United Stated might be classified as service learning. Mainly associated with teacher education and nursing, these programs place prospective professionals in the community as a means of providing a "bridge, a guided gradual introduction to service" (Johnson, Ratsoy, Holdaway & Freissen, 1993, p. 298). Although the aims are not exactly those of service learning, the process seems to exhibit a certain philosophical congruence.

Although Canadian public schools also lack an organized official service learning movement, there are, too, signs of interest and involvement through the likes of Knowledge Architecture's ITM program, and a multiplicity of peer tutoring and/or counselling programs in individual schools (McKay, 1994; Woodrow & Lum, 1997). Furthermore, there are probably a multitude of relatively unknown programs around the country like the two in British Columbia in which a grade seven class utilized their computing skills to produce a newspaper for the community, and a Biology 11 class used a local creek as a "living laboratory" to improve their academic understandings and add to an environmental assessment report (Bosch, 1998; Perrin, 1998).

Contributory Influences on Community Service Learning

Besides this primary stream of development, there were/are probably other forces at work in the shaping of the current conception of community service learning. Primary among these was, likely, the ongoing debate concerning the place of vocational education in the public school system. Though proponents of vocational education were rebuffed in their mid-nineteenth century demand for a school system more in keeping with the industrial agenda, they were able to sufficiently diffuse their ideology to the extent that both American and Canadian public education remains significantly characterized by the belief the primary goal of schooling is to prepare youth for the job

market (Grubb, Davis, Lum, Plihal & Morgaine, 1991; Lazerson & Grubb, 1974). And although this goal is not in keeping with the purposes of community service learning, it might be argued such a conception is presently finding erroneous manifestation in certain community service learning programs.

Another educational process which most likely had some effect on the development of community service learning is career experience, an educational program in which career development has been integrated into the school curriculum as a core subject. During the last decade, for example, a number of Canadian provinces have implemented or considered implementation of a program in which career development is integrated into the curriculum as a core subject (Technology and Life Skills Task Force, 1989). British Columbia, in particular, has recently implemented the compulsory grade 11/12 Career and Personal Planning (CAPP) program in which a classroom component emphasizing life and work skills is combined with a thirty-hour work placement (Province of British Columbia, 1994). Justification for this program includes the presuppositions that education should "contribute to the economy" (Schools Programs Branch, 1992, p. 5), and "students must be willing and able to develop personal career/life plans while building skills for independent living and responsible decision making" (p. 8). Because the rationale for career development loosely coincide with those of community service learning, it might be argued career development is also playing a catalytic role in the in the service learning movement. Certainly Dr. Taunton's position as the Western School work experience coordinator helped him to facilitate the community service learning placements.

Community Service Learning's Inconsistencies

Unfortunately, the development in the practices of service learning has not been accompanied by the acceptance of a common theoretical foundation. Indicative, for example, is Kendall's 1990 search of the literature which revealed "147 different terms and definitions related to service learning" (cited in Giles Jr. & Eyler, 1994, p. 78). However, while acknowledging the resulting confusion, Kraft does suggest the following definition of the 1993 Commission on National and Community Service is the most widely accepted and inclusive:

Service learning programs provide educational experience:
 a. under which students learn and develop through active participation in thoughtfully organized service experiences that meet actual community needs and that are coordinated in collaboration with school and community;
 b. that are integrated into the student's academic curriculum or provides structured time for a student to think, talk, or write about what the student did and saw during the actual service activity;
 c. that provide a student with opportunities to use newly-acquired skills and knowledge in real life situations in their own communities; and
 d. that enhance what is taught in school by extending student learning beyond the classroom and into the community and helps to foster the development of a sense of caring. (cited in Kraft, 1996, p. 136)

Notwithstanding, it must be noted the most significant discrepancy between the many definitions of community service learning is the sometime lack of reference to a time for student reflection about the meaning, processes, and need for service, or what "b" above refers to as the provision of structured time to "think, talk, or write about" the service experience.

Another reason for this lack of a common framework might be attributed to the differing opinions regarding the purpose of community service learning. Besides those stated and/or inferred by the Commission on National and Community Service definition, there are a multitude of other offerings. For example, Totten and Pederson (1997) suggest besides the academic component, service learning helps youths to: 1) accept responsibility for shaping, rather than just being shaped, by surrounding events, 2) demonstrate good citizenship, 3) posses a feeling of personal responsibility for and connection to the world, 4) understand the ways of government, 5) not just develop the ability to think critically, but to act critically as well, and 6) embrace many virtues such as courage, responsibility, honesty, and tolerance.

Further, regarding the understood purposes of community service learning, Olszewski and Bussler (1993) add that as a result of service learning, "there is the potential for warmer and more understanding relationships between institutions and community to spring from action-oriented and participatory endeavours where students and community members work side-by-side with common understandings and goals" (p. 10). Other perspectives add that service learning "provides developmental opportunities that promote personal, social and intellectual growth, as well as civic responsibility and career exploration" (Duckenfield & Swanson, 1992, p. 9); it "asks something of

youth while affirming that youth is important" (Ramsay, 1982, p. 145), and it involves persons in responsible and challenging action for the common good (Honnet, 1989). Finally, Wade (1997a) states the main reason for incorporating service learning is that it will help to rectify the decline of democracy due to faltering citizen community involvement.

Correspondingly, there is significant inconsistency regarding the question of the overriding purpose of service, itself. As Moskos (1988) suggests, any act of service must be directed toward "the performance of socially needed tasks that the market cannot effectively handle and that would be too expensive for government employees to carry out" (p. 1). As such, it might follow, that service learning participants are being politicized and socialized to accept the societal norms and status quo. For, they are "taught not only service, but often servility, not only discipline, but also normalization, not only independence, but often individuation" (Gorham, 1992, p. 107). Gorham goes on to say service becomes a business in which those who serve see the servee as somehow deficient and "the privileged definition of service is . . . antithetical to citizenship because it translates political problems into technical ones" (p. 118).

The contrasting philosophy, however, sees service tied inextricably to a type of societal critique in that it "helps the participants see their questions in the larger context of issues of social justice and social policy" (Kendall cited in O'Grady & Chappell, 1997, p. 20). Thus, its is argued, service should never be seen in light of charity but rather as an aspect of social change dependent upon participatory citizenship and democracy (Barber, 1988), with one of the defining features of community service being "a social justice rather than charitable framework" (Varlotta cited in Ludlum Foos, 1998, p. 14). Hence, if approached properly, service learning is understood to offer "students the opportunity to critically examine their own lives and the society around them through significant and authentic work in the community outside the classroom" (Anderson & Guest cited in O'Grady & Chappell, 1997, p. 7).

With all these differing perspectives, it should not be surprising practices vary accordingly. Kraft (1996) proposes the biggest distinctions lie in the relationship, or lack therein, between the academic and service components, and the form which the academic aspects assume. More

specifically, he says when curricular objectives are carefully tied to the service activities, usually in the form of individual or group projects, then true service learning is occurring. However, as this correlation often is lacking, he suggests these practices are thus better described as voluntarism or community-based learning than as service learning.

The other significant variants involve planning and reflection. In an analysis of the National Clearinghouse data base (comprised of information from 938 service learning programs), Shumer and Belbas (1996) found participants often did not use planning devices as modeled, and the reflective component "occurred occasionally in the community settings but not as often as desired" (p. 218). This lack of reflection on the meaning and purposes of service (as was also the case in this investigation) certainly would seem to add to the fears of the theorists who argue service learning promotes acceptance of the status quo rather than critical societal thought.

At the same time, the vast array of practical guides seem to contain certain general commonalities, if not of exact procedures then certainly of mood and intent. For illustration, I include three randomly chosen service learning "menus." First, Kinsley (1993) identifies the following components of good service learning practice: 1) full student involvement, 2) identification of a community need, 3) establishment of a classroom theme, 4) connection with a community partner, 5) and determination of classroom objectives. Second, Honnet (1989) suggests the ten principles of service learning include 1) the engagement of people in responsible and challenging actions for the common good, 2) structured time to reflect critically on their service experience, 3) the articulation of clear service and learning goals, 4) allowance for participants to define their needs, 5) clarification of the responsibilities of each person and organization involved, 6) matching of services providers and service needs through the recognition of changing circumstances, 7) expectancy of genuine, active and sustained organizational commitment, 8) inclusion of training, supervision, monitoring, support, recognition, and evaluation to meet service and learning goals, 9) flexible time commitment, and 10) commitment to participation for and by a diverse population. Finally, McAleavy's (1997) list consists of 1) the engagement of people in responsible and challenging actions for the common good, 2) the provision of structured

opportunities for people to reflect critically on their service experience, 3) articulation of clear service and learning goals for everyone involved, 4) clarification of the responsibilities of each person and organization involved, 5) inclusion of training, supervision, monitoring, support, recognition and evaluation to meet service and learning goals, and 6) commitment to program participation by and with diverse populations.

<div align="center">Community Service Learning's Conceptual Framework</div>

Service learning's most serious deficiency might well be its lack of a conceptual framework (Giles Jr. & Eyler, 1994; Saltmarsh, 1996; Wolfson & Willinsky, 1998b). That is, though proponents of service learning generally accept "students learn best when they apply their knowledge by observing and working with experts while performing real tasks" (Fertman, 1994, p. 9), there continues a serious search for a generally accepted theoretical explanation for this learning. As John Willinsky and I stated in our early explorations of service learning, "what has come to concern us, however, is not the quality and impact of the service component, but the difficulty in pinning down the precise nature of the learning" (Wolfson & Willinsky, 1998b, p. 22).

Reasons for this predicament may be manifold and complex. For example, Giles and Eyler (1994) suggest it can be attributed to service learning's ongoing development from a movement to a field, its present practical, rather than theoretical self-image, and its marginalization by academia. Saltmarsh (1996) ascribes the problem to the continuing confusion over the definition and aim of community service learning which "over the last 25 years has found justification in educational institutions as both an alternative pedagogy and as a movement of sorts aimed at transforming the culture of American higher education" (p. 14). Meanwhile, Cone and Harris (1996), being more concerned with solutions than causes, state that in order to be successful, "service learning is desperately in need of a theoretical foundation which considers the personal and intellectual growth of both the student and community" (p. 32).

Recently, however, acceptance of the need for a conceptual foundation has spawned a number of related explorations. Most of these ascribe a significant influence to the work of John Dewey (1938, 1943, 1961). Though admitting there is no evidence it was part of Dewey's

educational philosophy, Giles and Eyler (1994), for example, argue that "it appears that service-learning reflects, either consciously or unconsciously, a Dewian influence" (p. 78), and suggest "his contributions here to a potential theory of service learning are how learning takes place, what the learning is, and the relation of learning to action" (p. 79). Specifically referring to Dewey's emphasis upon 1) continuity, or the building upon previous experiences, 2) interaction between the individual and the environment, 3) the problematizing of the experience through reflection, and 4) the use of projects as a means for producing knowledge, they conclude "Dewey's educational and social philosophy, as we understand it, is a very good fit with the general understandings and claims of service-learning and with its potential to contribute to a theory of service-learning" (p. 82). Thus, with the intent of testing this hypothesis, they complete their paper by offering the following nine areas for further research into community service learning: 1) the continuity of experience, 2) the principles of interaction, 3) inquiry, 4) reflective activity, 5) truly educational projects, 6) concrete and abstract knowledge, 7) the greater community, 8) citizenship, and 9) democracy.

Similarly acknowledging Dewey never specifically addresses service learning, Saltmarsh (1996) also contends his writings "inform service learning through a philosophy of education, a theory of inquiry, a conception of community and democratic life, and a means for individual engagement in society toward the end of social transformation" (p. 13). Further noting Dewey's identification of education as a "deliberately conducted practice [and as such] is not a means to living but is identical with the operation of living life" (Dewey cited p. 14), Saltmarsh argues "his [Dewey's] writings also reveal that CSL is a pedagogy grounded in the philosophical tradition of American pragmatism" (p. 13). Saltmarsh continues his investigation by more deeply analyzing the correlation between community service learning and the following five areas of Dewian thought: 1) education and experience, 2) democratic community, 3) service, 4) reflective inquiry, and 5) education for social transformation. Through a deeper understanding of the relationships therein, and the proper resulting application of community service learning, Saltmarsh argues Dewey's conception of educating for critical citizenship can be realized.

David Kolb's work on experiential learning is also often attributed with playing an important role in the development of service learning (Cone & Harris, 1996; Saltmarsh, 1996). Building mainly upon Dewey, Lewin's "T" groups, and Piaget's developmental theory, Kolb (1984) proposed a student centred, experiential model which, he believed, would allow for differing interests and learning styles. He argued that by allowing students to observe or experience events upon which they could reflect, they would be able to develop concepts that interpret and yield generalizations so as to be able to test these concepts in varied experiences. Although, there is no evidence to support this thesis, his model "helped service learning educators develop an awareness of the role of reflection in relating the world of concrete experience to abstract theories" (Cone & Harris, 1996, p. 33).

Additionally, Cone and Harris (1996) have proposed a model to "promote conceptual knowledge by uniting the abstract world of theories from the academy with the unique experiences of students at work in communities" (p. 41). Building mainly upon Dewey's (1938) process of inquiry, Kolb's (1984) model of experiential learning, and Moore's "post-structuralist approach to experiential learning" (cited in Cone & Harris, 1996, p. 32), they "develop a model of service-learning that bridges the typically expansive gap between theory and practice" (p. 33). Specifically, emphasizing the "need for carefully planning the service-learning experience so that the student is intellectually challenged and appropriately placed, [their model attempts to provide] students with pre-service training and theoretical concepts that the student will be expected to apply and understand in the community" (p. 33). As such, they offer the following community service learning process: 1) identification of the learners and their specific learning needs, 2) conceptual and pragmatic defining of the learning tasks, 3) specifically delineating the learning/volunteer experience, as per the needs of the learners, 4) participant critical reflection upon the service experience, and 5) teacher involvement in mediating the learning. Following these five steps, they suggest, will result in "learners with newly integrated concepts" (p. 34). They present no evidence to support this contention.

As will have been noted, though the proceeding models offer suggestions as to where the

search for a theoretical framework might begin, and/or present a methodology by which conceptual learning can be facilitated, not one offers a theoretical rationale for the learning which does occur. Delay (1996), however, suggests "radical constructivism" rectifies this situation. He posits that its central proposition of unfettered individual constructivism best describes the process by which each learner, after being introduced to the community, constructs knowledge over which the teacher has no control: "teachers must recognize that they do not have ultimate control over the outcome . . . [while realizing that they] have an obligation to help participants consider the world through which they travel" (p. 80). This process, he continues, not only emphasizes the role of learner as active agent in their knowledge formation, but also focuses upon the importance of individual reflection as a means of opening doors to other than what is proposed by the curriculum. Delay, however, does not go on to propose a means of testing his hypothesis.

More recently Wolfson and Willinsky (1998b), find some parallel with Delay's proposition as they also hypothesize that the learning in community service learning is constructivist in nature. However, as previously explained, rather than identification of an extreme individualist position, they suggest the opposite. That is, the learning which occurs during community service learning is a function of the cooperative constructivism described by situated learning. In other words, while learning is constructed in the minds of each individual, this learning is facilitated and directed by all persons, resources, and artifacts with whom the learner interacts during the learning process. As previously reported, this proposition was born out by the ethnographic study of a technology class employing a community service curriculum (Wolfson & Willinsky, 1998a). It is given additional credence by this investigation.

Empirical Support for Community Service Learning

There tends to be a lack of empirical evidence regarding the effects of service learning. Some of the reason for this seem to involve the "lack of agreement on what is meant by the term service learning and exactly what it is meant to accomplish" (Kraft, 1996, p. 143), "the complexity of the field and the task of organizing and disseminating information" (Shumer & Belbas, 1996, p. 208), and the contention "service is not a single, easily definable activity like taking notes at a

lecture" (Conrad & Hedin, 1991, p. 746). Correspondingly, much of the research has been directed towards experiential and volunteer service-type programs rather than service learning, per se. However, there are certain general trends in the findings which do indicate the inclusion of service in the school curriculum, be it in the form of service learning or other types of field experience, is beneficial to the participants.

Much of literature on the effects of service and service learning is most readily accessible in the form of meta-analyses. Particularly extensive is Vue-Benson and Shumer's (1995) annotated bibliography from the National Service Learning Cooperative Clearinghouse detailing activities, participant benefits, and primary subject focus of the 938 programs in the data base. Although they find the results are still inconclusive, they also suggest "there is a body of research dating back to the 1930s which indicates learning in the community has [academic, social, and personal] value for the students" (p. 1).

Especially illustrative are the sections of their document entitled "Intellectual, Academic Achievement and School Behaviour Outcomes," and "Social, Psychological, and Intellectual Academic Outcomes." Of the 16 qualitative and quantitative studies in these categories dealing specifically with the determination of behaviour change as a result of involvement in service learning, 11 found positive psychological development and 8 noted positive intellectual development. However, though anecdotal support was robust, it was not uncommon to find a "lack of strong objective evidence of learning" (Hamilton cited in Vue Benson, p. 19).

On the other hand, one example included within this annotated bibliography which did find objective evidence was Markus, Howard, and King's (1993) experimental study on the effects of the integration of community service into an undergraduate political science class. Regarding the 89 University of Michigan students enrolled in Contemporary Political Issues, they found (using pre and post questionnaires utilizing a 5 point Likert-like scale) that the students in the two experimental groups had better attendance, and improved their levels of wanting to participate in the community and help others more than the students in the six control groups. At the same time, they also found those in the experimental group had statistically significant higher average marks than

those in the control groups. As a result, they went on to conclude "the experiential learning acquired through service appears to compensate for some pedagogical weaknesses of classroom instruction" (p. 410).

Meanwhile, Williams (1991) examined the findings of 12 quantitative and qualitative studies of the field experiences of nine high school programs, one junior high, and one university program. Summarizing the results of the four different areas covered by the studies, Williams found significant growth in personal development, and encouraging results in the affective and academic domains. Regarding career development, he was unable to draw any general conclusions. Specifically regarding academic growth, he concludes "even though a field education program does not directly intend to promote academic achievement, successful participation may indirectly and positively effect academic achievement" (p. 39). And concerning all the studies as a whole, he was able to conclude "field experience does promote the development of young people and this development is reflected in measures of achievement, self-concept, career maturity, and values and attitudes" (p. 29).

Conrad and Hedrin (1991), in their paper analyzing the literature on service learning, suggest that the generally inconclusive findings on the effects of service learning tend to be little different from the results of educational research as a whole. That is, "very little, if anything, has been proved by educational research" (p. 746). Thereupon, they do go on to state that quantitative studies of the relationship between academic growth and service found the strongest and most consistent positive academic growth in areas of peer tutoring, while those concerned with knowledge acquisition and problem-solving were inconclusive. At the same time, they determined that the quantitative research on social psychological development led to their conclusion that those involved in community service tended to gain in the following areas: 1) in social and personal responsibility, 2) in the development of favourable attitudes toward adults, 3) in the development of more positive attitudes to peers, and 4) in the growth of self-esteem.

In this same paper, Conrad and Hedrin also analyzed a number of the qualitative studies of the relationship between service and learning. Included among their conclusions was "a

consistent finding of research into service and other kinds of experiential programs is the high degree to which participants report they have learned a great deal from their experiences" (p. 748). For example, reporting on their 1981 nationwide survey of 4,000 students involved in experiential programs, they found "about 75% reported learning 'more' or 'much more' in their participation program than in their regular classes" (p. 748).

Kraft's (1996) excellent overview of the field of service learning contains a survey of the literature on the effects of service learning on both participants and the clients. He summarizes his interpretation as follows. First, regarding social development, Kraft thinks the findings are mixed even though many of the studies indicated positive growth. This is due, he said, to "small sample size, lack of strict control, the effect of previous volunteer experiences on the part of the students, and the uneven quality of student's experiences in the program" (p. 146). Second, concerning psychological development, Kraft agrees with the evidence that service learning and experiential programs did have a positive effect, but he also concludes more research needs to be done. Third, regarding moral development, he finds the research shows indication these programs may have a positive effect although there are still a number of questions left unanswered. Finally, Kraft turns his attention to the effects on academic learning. Thereupon, he also determines the findings to be mixed, but with the strongest results coming from peer tutoring. However, Kraft also mentions the research by Markus, Howard and King (1993) as being among the first evidence of the positive effects of service learning. Kraft concludes much of the other research in this area has been flawed because "the test instruments used to measure intellectual gain were developed by the same individuals who were responsible for the service learning program" (p. 151).

In preparation for their development of a service learning agenda for the next five years, Giles and Eyler (1998) also reviewed much of present research literature on service learning. As such, they determined "recent findings show that service learning has a powerful impact on student self-development, including such outcomes as a sense of personal efficacy, self-esteem, confidence in political and social skills, and the building of relationships with others" (p. 66). They also find that when involved in service learning "students are more likely to see themselves as

connected to their community, to value service, to endorse systematic approaches to social problems, and to have greater racial tolerance" (p. 66). Thereupon, they suggest it is time to put more effort into the investigation of the topic of greatest interest, subject matter learning. Though this area is of intense interest to faculty and administration, Giles and Eyler conclude unbiased evidence is lacking. In this regard, they were only able to cite two studies which used measures independent of participant testimonials to support the positive findings. Specifically, they referred to the above mentioned study by Marcus, Howard and King, and a study by Kendrick Jr. (1996), which showed only mixed results.

The study by Kendrick Jr. to which Giles and Eyler (1998) refer was modelled after the Marcus, Howard, and King (1993) investigation. Dividing his two introductory sociology classes into an experimental and control group, Kendrick attempted to determine whether twenty hours of service by each of those in the experimental groups would effect: 1) student performance in the course, 2) student attitudes toward social responsibility and personal efficacy, and 3) student self-evaluations of the course and their learning. Using such measures as class tests, essays, and attendance to chart student marks, and the Social Responsibility Inventory to assess changes in social responsibility and personal efficacy, Kendrick found that results were not exactly what he expected. That is, there were statistically significant differences on indicators of social responsibility and personal efficacy, but not for class marks. Kendrick attributed this failure mainly to the expectation that service-learning students were expected to learn the same material as the non-service learning students, rather than visa versa. Finally, Kendrick concludes though the study had limitations it was consistent with the findings of others in that "there is much of value in the service-learning technique" (p. 80).

Conclusion

Community service learning is an educational methodology/philosophy which lacks a commonly accepted conceptual framework, and whose success has been measured more in anecdotal than empirical terms. Thus, even though it is earning some recognition within the educational system, it has not been able to gain the justification needed to establish itself as a

credible discipline. My investigation, in its identification of the Information Technology Management Curriculum as a service learning program attempts to address these concerns. For, not only do the findings argue situated learning offers the conceptual framework for service learning but so, too, do they offer substantial empirical evidence to supplement the anecdotal support upon which community service learning has had to mainly rely. That is, the empirically determined learning outcomes suggest a rationale by which community service learning can be analyzed and determined, and add credibility to existing propositions that community service learning positively effects student academic development, social responsibility, and personal efficacy. As such, this dissertation may help to make community service learning a more tenable and viable instructional process.

CHAPTER 4: THE RESEARCH METHODOLOGY

Introduction

The purpose of this chapter is to detail my research methodology. I begin with a justification and general description of the chosen method and procedures: qualitative design emphasizing the ethnographic technique. These accounts are then operationalized by specifically elaborating upon how they are applied in this investigation, and through explanation of my means of data management and analysis. Finally, I elaborate upon the two different sets of limitations of this study, the first concerning my means of clustering data, and the second, regarding possible deficiencies of the study, itself.

Methodological Justification

There are a number of general reasons why I considered qualitative design to be a fitting form of investigation. As itemized by Miles and Huberman (1994), these include the following attributes of qualitative research which make it a particularly rich form of exploration: 1) it allows the researcher to gain a holistic overview of the context under study, 2) it enables the researcher to capture data from the local actor's perceptions, 3) it allows the researcher to isolate certain themes, 4) and through its focus on words as the main source of analysis, it is possible for the researcher to identify and investigate relevant and unique patterns.

Moreover, for the following reasons I also considered ethnographic inquiry's exploratory nature to be particularly appropriate (Marshall & Rossman, 1995). First, the educational use of information technology management is a relatively recent and innovatory phenomenon (Ely, Blair, Lichvar, Tyksinski & Martinez, 1996; McCormick & McCormick, 1992). Second, situated learning is an infant in public education. Third, community service learning lacks a generally accepted theoretical framework and other common understandings regarding means of implementation and resulting educational effects. Thus, in turn, if follows that if each of these considerations demands further preliminary exploration, so, must the integration of all three be similarly in need.

Having decided upon a qualitative approach, my next determination was of the specific

technique to be employed. In this regard, my reasoning began with the realization of the need to maintain the natural interconnectedness of all facets of the learning environment under study. As argues Entwhistle (1984), proper investigation and/or interpretation of the educational process is dependent upon the maintenance of cultural integrity:

> Attempts at applying the theories derived from this research directly to the classroom situation have not been particularly successful. It is now recognized that psychological theories must have "ecological validity"-that is, the theories must be derived from the setting to which they are applied. (p. 10)

In other words, I needed a research process by which the actions, interactions, and context of my particular culture of interest (the students, teacher, school, technology course, and community resources) were preserved.

Adding sustenance to this basic supposition of the need to maintain systemic integrity of the educational system are the particular parameters of my study. That is, for the following reasons the decontextualization of information technology management, situated learning, or community service learning would be especially damaging to cultural integrity. First, as this study finds its raison d'etre in the consolidation of information technology with the solving of community needs, an attempt to study either in isolation from the other would be particularly unintelligible. Second, because both situated learning and service learning are dependent upon the cultural context for their existence, any decontextualized investigation would be similarly meaningless. Hence, it follows that as the defining aspects of my study are not only an instrumental part of their culture, but are given sense through contextualization, it is doubly important cultural integrity be preserved.

Accordingly, due to its focus on cultural fidelity, the ethnographic technique appeared most germane. Not only is its purpose "to describe and interpret cultural behaviour" (Wolcott, 1985, p. 90), but its utilization of a variety of context-specific techniques encourages valid interpretation therein (Adler & Adler, 1994; Sanjek, 1990b). That is, ethnography's emphasis is not to just to interpret culture, but to do so in a credible and justifiable manner. At the same time, well aware of the impossibility of interacting with a culture without some modifying effect, ethnography also relies on certain reflexive techniques that allow the researcher a better understanding of the results

of these interactions and modifications. Journal keeping, for example, enabled me to record, understand, and account for biases and other behaviours that might have effected the interpreted culture and, thus, colour findings (Quantz, 1992; Sanjek, 1990a).

Another important consideration in my selection of the ethnographic technique was its treatment of the relationship between interpretive validity and research ethics. For, unlike more traditional ethical models, ethnographic research encourages respect for the voice of the participants, both as a means of preserving human integrity and as an investigative tool (Flinders, 1992; Haig-Brown & Archibald, 1996). Thus, by attempting to consider myself and the participants equal partners in the learning processes, I hoped to emphasize personal regard while simultaneously utilizing the resulting polyvocality to genuinely represent the studied culture. And finally, it can be added that ethnography's "unquestionably intuitive, idiosyncratic, and improvisational" (Ayers, 1989, p. 13) nature is in keeping with the novel and unexplored character of the ITM/situated learning/service learning relationship.

Site and Sample Selection

While searching for a "typical" city school in which to conduct an ethnographic study, a teacher at the high school in which I was teaching suggested that one of his acquaintances might be interested in becoming involved. A brief phone conversation with Dr. Taunton, a computer sciences teacher at Western Secondary School, confirmed this suspicion and led to the scheduling of more in-depth discussions on the matter. After two meetings, the first in the spring of 1997 when I first introduced the ITM curriculum to Dr. Taunton and presented him with my analysis of a similar program (Wolfson & Willinsky, 1998a), and a second in August 1997 in which we more specifically discussed my role and details of implementation, he agreed to allow me to approach his Computer Technology 12 class to see if they might be interested in both the ITM program, and my involvement as a researcher. At that time, Dr. Taunton indicated that besides helping to meet my research needs, positive student support would facilitate the initiation of a project component into his Computer Technology 12 course, something he had been pondering for some time.

Shortly after gaining backing for my project from the school's principal, I met with Dr.

Taunton's class on September 24, 1997. Mainly, I explained the significant aspects of the ITM curriculum such as the project management component, and emphasized the relative uniqueness of the opportunity to learn while offering something to the community. I also described a number of project examples from the class about which I had recently completed a preliminary investigation into community service learning, and then detailed some local site possibilities for their projects. Through preparatory initiatives, Dr. Taunton's and I had become aware a neighbourhood community club, the "school room" in a city hospital, a local elementary school, and a rehabilitation program for persons with disabilities might all be interested in having knowledgeable students help with computer hardware and software problems, and/or teach computer-users how to become more efficient.

Dr. Taunton and I also emphasized that unlike the class upon which my pilot project was based in which the entire course was focused upon a number of community oriented projects, Dr. Taunton's approach would be to integrate one 10 to 20 hour project (per student group) into the class as a whole. Thus, as the project component would comprise just a percentage of the total course, logistics required individual projects be staggered over the length of the academic year. In this way, certain groups of students would absent themselves at different times to participate in their community projects, while the remaining students stayed behind to meet the expectations of Dr. Taunton's presently existing course. In this regard, they were expected to mainly listen to lectures and take notes. At this time, we also accentuated it would be incumbent upon each student to "catch up on" what they had missed while out of the class working on his/her project.

Next, I elaborated upon my needs as a researcher, the separateness of my research from any form of assessment of their marks, and the students' individual rights to become involved with the ITM curriculum without participating in the research. In this regard, I also emphasized that my role, besides that of observer and interviewer, was simply that of helper, and Dr. Taunton had final responsibility for all aspects of the program. I also discussed the informed consent form which needed to be signed by the students and their parents if they wanted to participate in my research, and the anonymity of all my findings. As a show of hands then indicated the majority of the class

were interested in both the ITM curriculum and participating in my research, it was resolved that we implement the project.

Finally, Dr. Taunton suggested the students form groups of approximately two to four, give us a list of their names, and begin thinking about what projects might have caught their interest (from those we mentioned or any others of which they might have knowledge). In the remaining 15 minutes of class time, all the students got into groups, and one group of four quickly indicated to me that they would be interested on working on the project with the Community Club.

Over the next eight months all the students did participate in a variety of projects. These, I briefly itemize as follows: 1) the Community Club project, 2) the Western School support services worker project, 3) the hospital school room project, 4) the hospital adolescent psychiatric ward project, 5) the grade three web page project, 6) the Western School web page project, 7) the Western School Technology Department web page project, and 8) the Western School computer repair project. However, it must be noted that for the following reasons the final two of these projects are not fully described in the "findings and analysis" chapter. First, as the Western School Technology Department web page project is almost identical to the Western School web page project, in both process and outcomes, a detailed description would be redundant. Second, because the computer repair project was lacking a number of authentic community service learning/situated learning attributes, and because I had no opportunity to observe or interview either of its project members, it is given only cursory treatment.

Research Duration

Introductory initiatives began in June, 1997 when I first met with Dr. Taunton to discuss the possibility of working with his class. I met with the whole class for the first time on September 24, 1997 and concluded my last interview on April 4, 1998.[7] During this interval, the seventeen students whom I tracked dedicated a total of approximately 255 hours to their projects, and my total research time amounted to just under 45 hours. Of these, on site observations accounted for

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[7.] The reason that I finished so early in the school year is because Dr. Taunton had earlier informed me that because the students would be starting to study for their government exams soon after the Easter holiday, it would be necessary to terminate of my intervention with the class around this time.

approximately 26 hours, classroom observations for approximately 8 hours, interviews for about 8 hours, and informal discussions for about 2 hours. I also spent approximately 30 minutes distributing and collecting the demographic surveys, and about 30 minutes with the principal discussing the school profile.

Site Descriptions

The study was conducted in the Computer Technology 12 classroom of Western High School, a comprehensive public secondary school in a large urban centre in Canada, and at eight different sites where the project groups performed their on-site service. I begin with a brief description of Western High School and the Computer Technology 12 classroom, and then move to an elaboration of these different sites.

Western School

Western Secondary School, with its 107 teachers, is home to 1,847 grade eight to twelve students, of which 963 are male and 884 are female. English is the second language of 1400 of these students. According to the principal, the school catchment area is mainly middle class, with both parents working. Academically, she added, the school is known for its math and science accomplishments. To illustrate, in the year of my research, the junior students had placed first in North America in an international math competition, and the senior students had placed second.

The Computer Technology Classroom

The Computer Technology 12 classroom was located on the second floor of the school in the Computer Science Wing. In the class were approximately twenty-eight computers arranged in two longs rows, with the instructor's computer (and other equipment like an overhead projector and telephone) at the head of the class. The computers were not permanently connected to the Internet but through the phone line it was possible to connect one computer temporarily by means of a personal account. Upon the shelves around perimeter of the room there were also a number of disassembled computers.

The Community Club Site

The Community Club project took place mainly in the computer gaming room of a

community childrens club which is about a fifteen minute walk from Western School. The computer gaming room is a very small room (about the size of a large walk-in closest) which housed five to seven computers in various states of repair. As it was difficult for all four boys to be in the room at the same time, often one or two would also simultaneously work on parts of computers in the hallway outside the room, itself. Usually the group was unsupervised when they were working in the club, although on their first visit, the club contact person was present to "show them around" and explain what needed to be accomplished. On a couple of occasions, one or two of the computers were taken back to the Technology 12 classroom where the teacher was able to help the group with certain problems. However, the vast majority of time was spent by the boys at the club.

The Western School Support Worker Site

The school support worker project took place in a small resource classroom on the first floor of Western School. The two students involved on this project worked directly with the school support worker whose job it was to help certain new non-English speaking students become acclimatized to their new school and culture. During the vast majority of time devoted to this project, the two students and Garth, the support worker, positioned themselves close together around the single, very old computer which contained a number of educational games. Usually there were no other students in the room when the students were helping Mr. Dawson, but a couple of times students did quickly pass through.

The Hospital School Room Site

The hospital school room project was located in two closely connected childrens wards of a large city hospital. One of the students spent the majority of his time in the "school room," a large room in which teenage patients were able to keep up on their school work while in the hospital. The room contained a variety of chairs, tables, bookshelves, and about eight computers used mainly for the playing of educational games. At different times there were different numbers of patients and staff in, or passing through, this room. For example, at any one time in the morning there might have been eight patients and four staff in the vicinity, while in the afternoons, generally, there were

no patients in the school room.

The other student spent most of his time in the downstairs school room attached to the child psychiatric ward. Housing a number of tables and chairs, two computers, and two full time staff, this school room tended to be fuller and busier than the one upstairs. Attached to this room was a smaller office in which one computer was connected to the Internet. Sometimes the project student worked individually with one of the patients, in this room, showing him or her how to use the Internet.

Besides the times in these rooms, the two project students also spent some time in the office of the head teacher, showing students and staff how to use the Internet, and fixing the computer for her. One of the students also spent a short amount of time in a hospital room with a severely burnt young patient.

The Hospital Adolescent Psychiatric Ward Site

The hospital adolescent psychiatric ward project began in the same wards as the preceding hospital project. However, due to a shortage of tasks, after the first day the lone student involved quickly moved to another spot in the same hospital, the teenage psychiatric ward school room. In this room, housing a number of tables and chairs, bookcases, and three computers, the student worked closely with the two staff and approximately eight patients. At times, the student also worked in the ward office, on the teacher's computer.

The Grade Three Web Page Site

The elementary school project took place in an elementary school on the other side of the city from Western School. The two involved students worked on the one computer in the school library and in the grade three classroom with the class and their teacher. These rooms were typical of what is to be found in an elementary school.

The School Web Page and Technology Department Web Page Sites

Both of these projects took place in the Western School library, in different areas around Western School, and in the homes of the project group members. These students, generally, worked independently of anyone except for their group members.

The Computer Repair Project Site

The computer repair project took place in the Computer Technology 12 classroom and in the rooms of certain teachers who had their computers repaired.

Sample

Dr. Taunton's Computer Technology 12 class was a self-selected group of one grade 11 and 20 grade 12 students (17 male and 4 female) who had met the prerequisites for the course and registered of their own volition. However one boy withdrew from school shortly before his project was to begin. Of the remaining 20 students, 18 participated fully in a community service learning project (although as will be later explained, two of the projects did not necessarily display all the requirements of community service learning). Meanwhile, because two of the male students participated in a severely limited project of which I had no knowledge until well after my data collection was complete (and the class was over), they are not included in my sample. However, I do make some limited references to their project and some of its outcomes. Additionally, because I was unable to either observe or interview one of the girls in the school web page project, I make no significant mention of her in this investigation. In total then, my sample consisted of 17 students, 14 male and 3 female (implications of this disparity are discussed at a later time).

According to my anonymous survey (completed by all twenty students still enrolled in April, including the two boys and one girl who were not a part of my sample), all of the students were interested in some aspects of computing, and all except one considered him/herself as having above average experience with computers (Dr. Taunton later verified these perceptions). All of the students had previously taken at least one computer course, with most having completed three or four, and one student indicated he/she had taken 10 other course in computers. Eighteen of the students stated they had registered because of their interest in computers, one thought it would help with his/her future education, and one registered because of a timetable fit. Sixteen said they knew what the course was about before registering; however, none of these sixteen would have had knowledge of the project component because it was not added until after the course had begun.

Seventeen of the students ranked themselves as usually having an "A" or "B" average.

Three ranked themselves as a "C+", and one as a "C-". Seventeen of the students reported their best subject was one of the sciences, generally math, physics, or computer science. Thirteen of the students said they had their own computer at home, six shared with siblings, and one did not have access to a computer in the home. Fifteen of the respondents said they used the Internet "quite a bit" or "a lot."

At the time of my survey, the class was composed of four girls and 16 boys. Two male and two female students indicated the language spoken in their home was English (Dr. Taunton said that both the gender and language configurations appeared to be more or less the norm). Six of the students were born in Canada; other countries of origin included Hong Kong (9), Taiwan (2), Viet Nam (1), Macao (1), and the Philippines (1).

Dr. Taunton had been teaching for over 20 years and has a Doctor of Education in music, which he had taught for the early part of his career. However, he now considered himself a computer teacher, though, due to staffing requirements at the school that year, he also had to teach two blocks of English 9. Dr. Taunton told me he had developed the Computer Technology 12 course himself.

Data Collection

As will be detailed in the following paragraphs, data was collected mainly through participant observation and semi-structured interviews (Adler, 1994; Bernard, 1994) with students, clients, and the classroom teacher. Thus, as my primary means of ensuring internal validity, I attempted to triangulate my observations with all interview responses of the students and clients (Mathison, 1988). Accordingly, finding that either three or two sets of data were in agreement, or that one set remained unsupported, I classified the support for specific learning outcomes as strong, medium, or weak, respectively. Thus, for example, if my observations that the student showed him/her to be working more competently on the computers over time coincided with testimony of the client and the student him/herself, then I concluded there was strong support that the student had improved his/her computer skills.

A limiting factor of this approach, however, was that not all of the students were in a

position to receive triangulated support. That is, because seven students were observed neither by the researcher nor the client, and another three were observed only by the researcher, in these situations it was not possible to obtain either three-way and/or two-way corroboration. As a result, strong and medium support for learning may not have been as evident as might otherwise have been the case.

<div align="center">Participant Observations</div>

My primary means of data collection consisted of what Bernard (1994) and Adler (1994), respectively, term as participant observation, and active participant research. The main reason for my choice of this technique is that it delivers a significant degree of ethnographic validity, as follows: 1) it made it possible for me to collect different types of data as, for example, when I helped some of the students with particular computers, I was able to gain insights into what they were learning about computers; 2) since I assumed significant responsibility for the service component's ongoing development and implementation, my role could never be considered that of neutral observer, and thus by emphasizing this participation, any problems of reactivity were accounted for and thus minimized; 3) it helped me to formulate sensible research and interview questions such as those which evolved as a result of my participation in the elementary school project which was so summarily terminated; 4) through helping a student understand the teaching process, for example, I was given an overall intuitive understanding of the student's role and problems which needed to be solved, and 5) by helping to initiate the community service learning project as a whole, I was able to address an otherwise very difficult research problem (Bernard, 1994). Thus, whenever possible, I joined, interacted, and observed the members of the different project groups as they worked at their job sites, with my role varying as per the group and specific occasion. Additionally, due to the fact the classroom teacher and I were instigating this program for the first time, we spent time discussing its ongoing progress and methods of improvement. Similarly, I explained the program to, and discussed our expectations of the students with a number of clients prior to commencement on particular sites. Specifically, then, I observed and participated as follows.

The Community Club Project

After initiating the project (and explaining my research role) via two brief telephone conversations with the Community Club's program director, I was able to accompany the Community Club group on three of their four on-site excursions of approximately 1 1/2 hours each (I also drove the students back and forth between the school and the Community Club). During these times, I acted mainly as an observer, watching and recording their activities, and answering questions; although, I also sometimes interacted in a variety of ways. For example, I helped them search for some club employees, went to look for a tool they thought they might need, and offered advice regarding means of communicating with Clarise, their contact person at the Club. I also offered suggestions and advice on record keeping and project planning, though they were not necessarily taken.

However, besides the one visit to the site on which I was unable to accompany them, there were also other times when I was also not able to observe certain facets of their projects. For instance, I was not available when they worked on two computers they had brought back to school to fix. Also, I was not privy to most of their short planning discussions interspersed at different times during the project, their telephone conversations with each other, nor the telephone discussions between the group leader the club contact person. And unfortunately, neither was I present when the group leader made his last solo trip back to the club to finalize project details.

Western School Support Worker Project

I also spent a significant amount of time observing the school support worker group. I was present for three of the approximately 4 1/2 hours that the two students worked quite closely with Garth Dawson. During this time we all talked and interacted on a relatively consistent basis, and though I was not able to give any technological advice, I did try to mediate some of their interactions. For examples, I tried to "translate" or make up for misunderstandings which arose due to the great disparity between the technological understandings of the students and their "student," Garth Dawson. Also, I tried to facilitate a greater degree of participation on the part of Billy, the very much less assertive project group member.

The Hospital Projects

Beginning with my meeting with the staff of the "school room" in which I explained Dr. Taunton's expectations of the students and my research role, my observations and interactions with both the hospital groups followed similar patterns to those of the Community Club. However, the percentage of time of which I was able to observe and participate was not as great. Of the 30 hours each of the three participants spent in the hospital, I was present for 15 hours in total. Thus, considering that the two boys (Wilson and James) in the first hospital project group spent most of their time separate from each other, and the one participant in the second group (Lenore) was always on her own, I spent approximately only 4 1/2 hours with each of the students. Obviously, then, there are many significant events and interactions about which I am ignorant.

On the other hand, because the hospital projects both involved a wider array of tasks than the Community Club project, I was able to interact to a greater degree than I had with that group. In this regard I was able to offer advice on their dealings with Macintosh computers, and on how the students might help some of the patients whom they were tutoring. Also, because each of these students spent a great percentage of his time alone, we were much more able to just chat about different aspects of the projects and their involvement. I also was able to spend a relatively large amount of time talking with Lenore, as she was on her own except when working individually with the students.

The Grade Three Web Page Project

The elementary school project was unique in the percentage of observational time it afforded. I was present for the whole two hours that the on-site aspect was in progress. Included in this participation was an opportunity I had to introduce the project to the grade three class while waiting for the project students, Delores and Rosie, to arrive. However, due to the termination of the project after just this first session, the significance of the project, and my observations were limited. Unfortunately, I was not privy to the original introductory/planning meeting when the two students went to the school with Dr. Taunton to discuss possible project directions with the staff as a whole. And neither was I able to experience the interactions between the students when they were thinking

and talking about their project (and its termination) while at school or over the telephone.

The Web Page Projects and the Computer Repair Project

In contrast to the previous experiences, the two web page projects and the computer repair project offered very little opportunity for observation and participation. Regarding the two web page groups, this was due to the fact that both groups worked mainly at their own homes and/or over the telephone in the evenings or on weekends. And though I did meet briefly with some members of each group in the classroom to get some feedback on their progress (and offer a bit of planning advice), I was never present when they were actually involved in their project activities. I was even less involved with the computer repair project; for, I was not aware of its existence until I became the recipient of a class set of individual project descriptions and self-assessments which Dr. Taunton had solicited from the students.

Classroom Observations

I also spent about 8 hours in the computer technology classroom. Most of this time was spent just "being there" when the teacher was lecturing to the class, but there were also instances when I was afforded the opportunity to interact with specific groups and individuals (as mentioned above), offering suggestions on what project they might pursue, and help on ways they might proceed. I also asked each group and its members about their progress, and handed out forms which they could use in the recording of data and scheduling time. In most cases these forms were never returned to me.

Semi-Structured Interviews

The second most time consuming means of data collection were the semi-structured interviews which further encouraged validity through: 1) the development of core probes which arose as a result of my role as participant observer, 2) the triangulation which resulted through comparison of my observations with the interview testimonies of students, clients, and the teacher, and 3) the encouragement of open-ended responses leading, perhaps, in unthought of directions (Mathison, 1988; Bernard, 1994; Sanjek, 1990a).

In total, I interviewed 17 students, 9 clients, and Dr. Taunton. The 4 students who were not

interviewed included the one boy who withdrew from school before beginning his project, one student with whom I never was able to coordinate times, and two boys who I never knew participated in a project until well after my interviews were complete.

Unfortunately, the interview with Dr. Taunton provided virtually no data which could be used to either support or discredit my observations, or the interviews with other stakeholders. That is, as Dr. Taunton explained, because he had very little contact with the students during their on-site excursions, and because his class time was almost entirely devoted to presenting his standard course curriculum through lecture format, he was only able to offer a few general opinions regarding the projects as a whole. He had no comments on how particular students had developed and could not ascertain if student involvement in the projects had any influence on class performance. Generally, though, he was pleased with the projects.

Interviews with the students were from 15 to 25 minutes long, with most encompassing about 20 minutes.[8] Each of the interviews with the students, except one, were tape recorded, either in one corner of the classroom or in the hallway outside the classroom while the rest of the students were in class. The one exception, carried out by e-mail at the student's request, took place over the course of a week. In this case, I e-mailed a number of questions and then sent a new set of questions to clarify some of the responses.

I generally began my interviews with the students by asking what was most memorable about their project and/or what they felt they had learned. I would then try to let the student continue in the direction of his/her choice but when he/she seemed to run out of things to say I would try to direct the questioning to any specific themes of which I hade become aware during my observations. If, as often was the case, student responses were quite brief (I think, due in part to language difficulties), I would also try to pursue their important lines of thought, and if that was not possible, I would refer to my list of interview probes which I had drawn up, although I seldom had time to refer to more than three or four of these (table 3). One motif which I tried to follow related to how the students' school and work experiences differed, particularly regarding the assumption of

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8. Interviews were kept to this length to conform to the dictates of the ethical guidelines..

individual responsibility which was inherent in being seen as the "computer expert." Another line

of questioning I sometimes pursued regarded how the service experience might effect their ideas

about service, and about future career choices. As illustrated on the list of probes, I also made up

some specific questions for the two students whose project was terminated after the completion of

their first on-site visit.

Interviews with clients lasted about 2 hours in total, and varied as follows: 1) with Garth

Dawson, the school support worker, a 1 hour taped session, and a second 5 minute informal

exchange while we were passing in a hallway, 2) with Clarise, the community club program worker,

one 20 minute taped session, and three or four very brief telephone exchanges, 3) with Judy, the

head teacher in the school room at the hospital, one 25 minute taped session, and three or four

informal exchanges in passing, 4) with Maria, the child care worker in the teenage psychiatric ward

at the hospital, one 15 minute taped session, 5) with Deirdre, the teacher in the teenage psychiatric

ward, one 5 minute taped session, 6) with Mary and Patsy, two hospital school room teachers, a 5

minute and 2 minute, respectively, telephone exchange. In each case, my general line of questioning

regarded what the student had learnt during the experience, how the student might have changed,

and what might be the clients' particularly significant and/or memorable events. Because client

response tended to be considerably longer than student responses, the interviews were more open

ended. Each of these interviews occurred at the client's work place, in relative privacy and quiet.

Besides a number of ongoing discussions with Dr. Taunton concerning implementation

and progress of the service component and individual students, I also taped one 55 minute

interview. In this case, I began by asking his perceptions of the course and then occasionally

interjected for clarification. I did specifically ask him what the students might have learnt from this

experience. Although, as previously reported, this interview offered vary little data concerning how

the students had progressed.

<u>Surveys</u>

Further testimonial data was provided through an (approximately) one to two page written

self-assessment of learning which Dr. Taunton requested from each of his students, and then later

passed along to me. However, as I observed neither Dr. Taunton's method of presentation of this request nor the resulting student response process, and because Dr. Taunton used these paper to help in the determination of student marks, the information was used only in a supplemental manner. When I have directly quoted such data, italics are used to so indicate.

I also collected demographic data from three different types of surveys. The first was through a brief questionnaire (Appendix A) which I developed and then administered to the Computer Technology 12 students during the course of two of their classes (with Dr. Taunton's permission).[9] The second set of demographic information, pertaining to the school as a whole, was garnered from official school records which were made available with the permission of the principal, and through a brief discussion with the principal. This data had been collected to meet the needs of Provincial educational accreditation, a process to which Western School was committed for the 1998/1999 school year.[10] Finally, information about the Computer Technology 12 course, itself, was gained from the course outline and specific lesson plans provided by Dr. Taunton.

Data Management and Analysis

Data was managed, and analyzed through the use of an ordered display on a case by case, and student by student basis (Miles and Huberman, 1994). That is, each of the projects was first treated as an independent scenario with my observations and the student and client interview responses clustered according to the dictates of my previously explained conceptual framework. As such, congruence between the four conceptualized contexts and the students' practical experiences were identified and recorded. Thus, for example, after recording and transcribing a particular interview or observational session of the Community Club group, I registered within the"cooperative context" category the data which suggested that the group as a whole (or individual members therein) had exercised its interactive facilities. In this way I was able to

9. The form took only about fifteen minutes for each student to complete but it was administered over two classes so that those students who were absent from the first class could participate. After a short introductory explanation, I handed out the forms which students returned to me at different times during the course of the class.

10. Accreditation is a Ministry of Education procedure by which every eight years each school in the Province undergoes scrutiny to ensure compliance with prescribed standards.

compile a working chart of certain behaviours and responses in accordance with my four situated

contexts of learning, and determine an emerging pattern regarding the resulting nature of learning.

As the investigation progressed, I similarly compiled my observations of particular students,

and/or interview comments of students and clients regarding the individual student learning which

had occurred during the course of their projects, and as related to the emerging nature of learning as

described by each of the contexts for learning. For example, I determined that because of positive

changes in behaviours which resulted from having to work as part of a group (as identified by my

observations and student and client testimony), a particular student had improved her group work

skills, an ability inherent to the collaborative category.

Table 3: Student Interview Probes

Student Interview Probes

1. What are the most memorable part of your project experience?
   -Give leads: group work, planning computers, etc?
2. What parts were the most productive/rewarding, etc?
3. What parts were the least productive/rewarding, etc?
4. What did you think of the group work?
5. Did you learn from your group members?
6. What did you think of the process of working in a group?
7. What do you think of being involved in real tasks for real people?
8. What motivated you?
   -Marks?
9. What do you think about being involved in the particular community?
10. Is volunteer work important?
11. What do you know, or feel or can do better than you could do before this experience?
12. What did you learn?
13. How can you use what you have learnt?
   -For school, university, business?
14. What will this experience let you add to your resume?

Others Possible Questions for Delores and Rosie
1. Give me an overview of what you did
2. What about the preplanning session?
3. Did you learn anything as a result of your project being cut short?
4. How did the class session go?
5. Did you think that things were properly planned?
6. Would you attempt such a project again?
7. Were you surprised when you were told that the remainder of the project was cancelled?

At the same time, though, because I found it was not always possible to attribute specific

learning to one of my particular contexts, often certain outcomes were deemed to result from an

interaction of different contexts. Thus, for example, as a result of a interview response which indicated a student had developed her self confidence, I concluded learning had occurred due to the interaction of a number of factors such as the student receiving positive feedback from the client while they were working together (corresponding to the collaborative context), and/or her solving of an authentic problem (corresponding to the authentic context).

Table 4: Thematic Attributes and Corresponding Learning Outcomes

THEMATIC ATTRIBUTES	LEARNING OUTCOMES
Improved interactive skills, leadership skills, teaching skills, group social skills, and new attitudes concerning group potential.	A. Group skills
Improved problem-solving abilities, and new attitudes about problem-solving.	B. Problem-solving
Improved computer software and hardware skills.	C. Technology skills
New awareness of the demands of the real world workplace, particularly an understanding of the related responsibility and the difference between school and work.	D. Workplace responsibility
Improved preparation, planning, organization, and management of all aspects of the projects, and new changes in attitudes concerning project management.	E. Project management skills
Growth in personal confidence, patience, maturity, and independence.	F. Personal Development
Development of new attitudes and behaviours concerning the giving of service.	G. Service Ethos
Increased knowledge about any aspect of one's community of practice.	H. Community of practice knowledge

Thereupon, eight different sets of thematic learning attributes and their related specific learning outcomes emerged and formed the basis by which relevant interview responses and/or changes in student behaviours regarding learning outcomes were categorized (table 4). For a matter of convenience, the specific learning outcomes are abbreviated throughout as follows: A. group skills, B. problem-solving, C. technology skills, D. workplace responsibilities, E. project management skills, F. personal development, G. service ethos, and H. community of practice

knowledge. Thus, simultaneously, it was possible to ascertain and categorize the general nature of learning evolving within each project (for example, collaborative and/or authentic) while determining the specific (and related) learning outcomes of each student (for example, improved technology skills). Thus, I was able to determine the extent to which the projects met the conditions of these aspects of my thesis statement.

<div align="center">Categorization Limitation</div>

Because the four situated contexts of learning are not mutually exclusive, it was often impossible to definitively categorize the determined natures of learning as belonging entirely to one context or another. For example, one of the student's interview responses that, "normally the stuff I did with my mom is one-on-one helping the kids with their stuff, and this is probably the first time I did it with a really large group" can be seen to be both a facet of problem-solving and a direct experience with a community of practice. In other words, I had to make a decision as to whether the related nature of learning was primarily associated with the "situated" or "cooperative" context. At the same time, even those events which at first appeared relatively easy to categorize, could be argued to be similarly problematic. For example, I easily placed items involving social interaction in the "collaborative context," and those involving planning within the "theoretical/reflective" context. However, as each of these events occurred in the course of pursuing an "authentic" action within a "situated" context, a case could also be made for their assignment to either of these contexts. Thus, it might be said my ultimate categorization was a function, first, of a logical determination of what aspect of the learning appeared most dominant, and second, of intuition when logic on its own was not able to finalize the decision.

Although this is not as precise as might have been preferred, for the following reasons, I argue, findings are not compromised. First, there are a number of significant arguments favouring the validity of intuition, and other non-cognitive types of intelligence (Jaggar, 1989; Lloyd, 1989; Gardner, 1993). In other words, categorization according to "feel" might be just as significant as one based wholly on what is termed rationality. This perspective has particular relevance for ethnographic investigations in which subjective judgements are made on an ongoing

basis (Ayers, 1986; Bernard, 1994).

Second, although it might also be argued that although definitive categorization of all learning outcomes might give greater support to our particular visualization and delineation of the framework as a whole, this step is not essential to this enquiry (Wolfson and Willinsky, 1998a). For, as the primary function of this investigation is the determination of whether (and what) situated learning occurs during the course of the situated learning experience, particular categorization is not a necessity. As such, neither are findings concerning the ensuing nature of learning nor about the expansion of learning outcomes compromised. Finally, it can be argued that as situated learning is something which happens as a result of the interaction of a number of variables, this lack of categorizability is in keeping with its nature.

<div align="center">Limitations of the Study</div>

There were a number of possible limiting factors effecting this study. Although each of these did not necessarily play a significant role, in the interests of maintaining verisimilitude I mention them all. I begin with those which I feel had the greatest possibility of being instrumental and move to those of lesser import.

The first and most significant limitation of this study is related to my inability to spend greater amounts of time with each of the project groups than I did. As previously detailed, as my participatory observations were limited, so is potentially further corroborating evidence. It is also possible that due to my absences, I am unaware of certain other themes, lines of thought, or incidences which might have driven this investigation in different directions. This is particularly relevant in light of the fact many of the interview probes evolved as a result of my observations.

The second limitation is that their classroom teacher, Dr. Taunton, was unable to add any perspective on what the students had learned, other than to say that all of those with whom he had discussed the project indicated they had enjoyed their involvement. Supporting evidence of learning coming from Dr. Taunton would have added significantly to my findings. The fact Dr. Taunton was unaware of most of the effects of his students' participation, however, tells a lot about the lack of proper organization and planning of a classroom component for the projects.

The third limitation is that some projects operated in such a way it was not possible to triangulate results. Specifically, for the two projects in which the groups worked independently it was impossible for even two-way support to be garnered. Similarly, because the client in the Community Club project was often absent from the job site she did not generally have the opportunity to observe all of the students and, thus, two way support was elusive. If this had not been the case, I surmise that support for certain learning outcomes would have been stronger. Also, because one project was terminated so quickly, I had the opportunity to neither interview the client, nor to satisfactorily observe the behaviours of the two students.

A fourth limitation regards the short time duration with which I had to work. Because student project were, at most, 30 hours in duration, the opportunity for students to demonstrate learning-related behavioural change was limited. Also, because the study is "one of a kind" there is no way to determine how much students retained of what they were found to have learned in the period under study.

A fifth limitation ensues from my amateurish interviewing techniques. That is, as I reviewed my interviews I was struck by the consistency by which I failed to follow up a particular response or initiate a relevant line of questioning. I feel if I had done so, results would give even stronger support for the thesis.

The sixth limitation is related to my inability to draw conclusions regarding gender differences and technology. Although related investigations were outside the scope of this investigation, it still would have been beneficial if it were possible to make recommendations regarding ways in which educational technology could be implemented to help alleviate gender discrepancies.

A possible seventh limitation is related to the compromising of flexibility due my reliance upon a predetermined framework. That is, because the four contexts of situated learning, as established in my earlier works, became the focus of this investigation it is possible that alternative themes and/or motifs were overlooked. For example, concentration upon an individuated rather than cooperative learning process may have resulted in totally different findings. Certainly, at times during my

interviews with students, I wondered how interview directions might have been different if their responses had been entirely left to chance.

A possible eight limitation is that the participating students may have positively embellished their individual testimonies regarding what they had learned. This may be the case for two reasons. The first, emanating from my original declaration to the students that they would be doing me a favour by agreeing to become involved with my research, is that certain individuals may have felt they would be helpful by telling me what they assumed I might like to hear. That the students were especially friendly, helpful, and accommodating may attest to this possibility. So might the written statement by one the students (on the previously mentioned self-assessment solicited by Dr. Taunton) that he "completed a project for Mr Larry Wolfson" indicate he had my wants in mind. The second reason why some students might have adorned their statements is that they could have thought that the more they reported as having learnt, the better would be their mark. Though I had stressed that my research could in no way be considered an assessment of their progress, in effect, this was possibly a difficult distinction for all students to maintain.

CHAPTER 5: FINDINGS AND ANALYSIS

Introduction

This chapter presents the research findings as they bear on the learning outcomes resulting from the students' involvement in the ITM program. I begin with an introduction to the projects as a whole and then explain the details of the individual projects. As such, I give an overview of each project, describe and contextualize the determined outcomes of learning, and then draw relevant conclusions. Finally, I summarize all the projects' results and offer comments regarding the inherent natures of learning.

The Individual Projects

This section presents the student learning associated with the six primary community service projects: 1) the Community Club Project, 2) the Western School resource worker project, 3) the hospital school room project, 4) the hospital adolescent psychiatric ward project, 5) the elementary school web page project, and 6) the Western School web page project. For each project determined learning outcomes are clustered as per appropriate correspondence with each of the eight different themes which emerged throughout the course of the investigation: A) group skills, B) problem-solving, C) technology skills, D) workplace responsibilities, E) project management skills, F) personal development (confidence, responsibility, independence, patience), G) service ethos, and H) community of practice knowledge. Thereupon, these outcomes are presented and explained in context of the researcher's observations of changes in behaviour and attitudes of particular students, and/or specific client and student testimony. In many cases the observations and/or testimony are self explanatory. When it is not, my interpretation is presented. At the end of the presentation of the learning outcomes associated with each project, I offer my conclusions regarding the significance of these findings.

As discussed in the methodology chapter, each of the learning outcomes is classified as having strong, medium, or weak support. That is, strong support is determined by three-way triangulation of evidence (student, client, and researcher), medium support indicates corresponding evidence from any two of the stakeholders, and weak support refers to a single evidentiary source.

In a very few cases, as I explain when necessary, I conclude that medium evidence existed based simply on the testimony of one student, and my perception of behaviour changes as indicated by interview responses and student demeanour. Also, it will be noted, because the final two projects were not observed by a client or researcher, the existence of strong support was not a possibility. Finally, throughout this chapter certain data is occasionally presented in italics. This is done to indicate when a particular piece of evidence ensues from a student's final written self-assessment for Dr. Taunton, a data source of which I had no knowledge until presented to me after my research was completed (and the Computer Technology 12 class had finished for the school year).

1. The Community Club Project

Overview

Project group members

Emmett (m), Dave (m), Kai (m), Jimmy (m).

Project client

A community boys and girls club, referred to as the Community Club or the Club.

Project goals

To "trouble-shoot" the Club's computers which were used for game playing.[11]

Project description

The Community Club is a non-governmental agency offering a number of programs for children in the community. One set of programs involves the use of the Club's four or five very old computers for game playing, often under the auspices of a volunteer supervisor. However, due to the age of the computers, their heavy use, and lack of technical expertise by Club staff and volunteers, often many of the computers were either not working at all, or were working at less than their full potential. Thus, the project involved the determination of software and hardware-related problems and subsequent repair, when possible. Usually the group members were unsupervised when they were working in the Club (however there may have been other staff or Club members

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11. Generally, trouble-shooting refers to the following tasks: virus detection and removal, removal of outdated programs, writing and installation of new programs, and the diagnosis and repair, if possible, of certain hardware items.

otherwise engaged on the premises), although on their first visit, the Club contact person (Clarise) was present to "show them around" and explain what needed to be accomplished.

Site description

The Community Club project took place mainly in the computer-gaming room of a community boys and girls club, housing five to seven computers in various states of repair. However, as this was a very small room (about the size of a walk-in closest), often one or two of the group members, while working,would spill into the hallway outside the computer room. On a couple of occasions, a computer was taken back to the Technology 12 classroom where their teacher was able to help with certain problems.

Project location

At the Community Club building, about a fifteen minute walk from the school.

Project logistics

Students either walked back and forth to the Club or rode in my car. Also, I used my car to transport those computers which were taken to the classroom.

Project duration

The project lasted about two months during which time each of the participants worked approximately 12 hours. Ten of these hours involved on-site trouble-shooting, and the rest were divided between planning, record keeping, and in-class trouble-shooting. Emmett, the project leader spent extra time on the phone with Clarise, and made one last solo trip to the Club to complete the final details.

Client contact person

Clarise, the Club's program director

Contact person role

Clarise officially oversaw the project but as she knew little about computers she was only superficially involved. Besides meeting with the students on their first appointment to explain what she would like done and overseeing the initiation of the work, Clarise mainly scheduled future appointments and received communications regarding progress. On most occasions she was not in

the Club when the boys were there, and thus they were mainly "on their own." However, Clarise often spoke with Emmett, the group project-leader over the phone, and met with him on his final visit to the Club.

Other involved client representatives

There were no other persons involved on a consistent basis, although on a few occasions when the students were working in the Club, they briefly interacted with other staff. These interactions, however, were related in only a cursory manner to the tasks they were performing. For example, once the students had to borrow a screwdriver from the Club's maintenance man, and on another occasion they explained to one of the uninformed staff member what they were doing.

Process of project initiation

I initiated this project by phoning the Community Club (Dr. Taunton had told me of the its existence) to see if they might be interested in the services which the students had to offer. I spoke with Clarise, explained the goals of the class, and elaborated upon my purpose and role as researcher. She "jumped" at the idea of the students helping with the computers. Thus, when this particular group showed interest in this project, I phoned Clarise to establish the initial contact.

Researcher's participant role

As mentioned, I initiated the project, drove the boys to their initial contact, and provided transportation for the computers. On the two other occasions when I was able to accompany the group, I also drove different group members to and from the site. At times, I tried to act as a catalyst making sure the project was progressing satisfactorily. In this regard, I spoke with Clarise and Emmett over the phone, and with Emmett and the other group members in the classroom.

Researcher's research role

On the three occasions when I was able to accompany the group to the Club, I observed and recorded their actions and interactions. During the course of the project, there were also in-class times when I interacted informally with the group members, and when appropriate, recorded the proceedings (in writing). Finally, at the completion of the project, I interviewed each of the group members privately (one via e-mail), and Clarise. All the interviews were transcribed verbatim.

Total research time

a) On site observations, 6 hours, b) informal conversations with the students and with Clarise, approximately 30 minutes in total, c) personal interviews with four group members, approximately 25 minutes each, and with Clarise, 30 minutes, d) e-mail interview with Dave, approximately 1 hour. Total time, approximately 9 1/2 hours.

Outcomes of Learning

A. Group skills

For Clarise, for me, and for the group members, one of the most significant parts of this project involved various aspects of collaboration and interaction. For example, when I asked Clarise what was most memorable about the project, she quickly mentioned the way the boys worked together. Thus, she referred to how "everything that was going on in there was productive noise; they were not yelling at each other but there were questions being lobbed back and forth." In this regard, she specifically recalled interchanges such as:"what about this?" and "are you doing this?" She also referred to the boys "really working as a team, each one working on his individual computer, the same time using the other's knowledge to better figure out what is going on." Similarly, my notes suggest I observed how each of the students, without direction from an adult, determined what needed to be done, and how individually and cooperatively they worked out the required process. Hence, they worked as a unit in which the individual who appeared the most capable with any particular aspect was able to lend assistance to those who were in need of help.

Correspondingly, all of the students in the group made a number of references to the role of group interactions in their projects. Three of the young men specifically mentioned a number of times each that they came to realize the importance of working in the group. For example, Kai spoke about the importance of communication and expert help:

> Working in a group like I actually got lots of help from the people to solve the problems. . . it gives you better communication, very good communication; . . . Emmett is the one who knows mostly about computers. We usually ask him some questions we don't know and he's the one who knows most about it.

Statements from other members concerning the group process included, "I learned that there is more into trouble-shooting computers and that you need some other people to help you figure things out; . . . the group members did give each of us confidence that we are not alone and an addition of knowledge" (Dave); and "ya sometimes, ya like share what we are thinking, what we think of that make the problem" (Jimmy).

Emmett's perspective of the group process was heavily influenced by his ongoing role as the group's leader. He acted as their initial spokesman when the group first came together, maintained contact with Clarise, and, on his own, made the last visit to the Club to ensure satisfactory project completion. Also, during the on-site visits he was the one to run special errands (such as going to find the maintenance man in order to borrow a screwdriver), the one who volunteered to walk back to school because my car did not have room for four, and the group member who sometimes exerted subtle decision-making power. Although part of his leadership might be attributed to confidence stemming from his superior English skills, I think it also ensued because the other boys saw him as their peer expert. According to Dave, Emmett was picked as the leader because "he's smart and very responsible." While acknowledging his role as leader, and perhaps slightly disappointed he did not have the opportunity to learn from someone else, he stated "if your group was diverse enough and had knowledge about different things we could probably learn a great deal from each other."

In conclusion, the group work component was clearly a successful aspect of this project. All of the students made explicit statements about their awareness of how the group members worked together to meet the goals of the project. Emmett, as group leader acted as a unifying agent and developed more fully in a variety of way than the other students due to his extra commitment and responsibility. Very visible in his process of maturity was the ease and confidence he began to display in his leadership role. There is medium support for Emmett's development in this area, and weak support for Kai, Dave, and Jimmy.

B. Problem-solving

All of the young men testified they had improved their problem-solving abilities. Generally, they attributed this development to having to determine what was wrong with the computers without the help of their teacher or any other expert. Thus, when I asked Emmett about what was memorable about the project, he replied he "learned a few things more about the process of trouble-shooting a computer," and then continued to describe this process as one in which "we tried to figure out starting from the root process, and then we work our way through the steps until we hit a dead end and then we'd try to limit the possible factors that could have caused that problem." Comments from other students include the following. Kai stated "well possibly I learnt from Emmett, but mostly on doing stuff on computers, by looking at computers, doing it and I learnt;" Dave said the most memorable aspect of the projects was when, "when we were able to have been given experience on trouble-shooting on what's wrong with which computer," and Jimmy, in his final submission to Dr. Taunton wrote, *"I get lots of opportunities to figure things out, problems."*

My notes emphasize this focus on problem-solving. For example, when the boys first entered the computer room after a brief introduction to the project from Clarise, I described the session as a "time of introductory problem-solving characterized by an obvious degree of seriousness, concentration, and intrinsic motivation." Also, I wrote the "mood of the room was one of excitement and energy as the boys worked both individually and cooperatively, asking questions of each other and offering mutual support in order to determine what was wrong and what needed to be done." Typical interactions which I recorded included the following: "I have not used Windows 2.1 for a long time," "got it," "there we go," and "what's wrong with this one?" More significantly, however, my continuing observations of increasing confidence in risk taking and refined problem-solving processes and activities led me to agree with the students that they had all improved in this area.

Clarise also commented she thought Emmett must have improved his problem-solving abilities. Although she admitted she did not have the expertise to actually determine if he knew more in this regard at the end of the project than the beginning, Clarise did say his changed

demeanour in the way he worked indicated he was more comfortable and confident in how he approached the problems facing him. Thus, regarding his last solo visit to the club when he wanted to make sure all of the computers were working properly, she said "Emmett, he just came in and made sure that all the programs were exactly where he wanted them to be."

In conclusion, the problem-solving aspect was also very successful. Perhaps, due to the authenticity of their tasks, all the students were motivated to solve the problems they faced and, as a result, determined new ways of problem-solving. Generally, the young men described how their problem-solving was related to group effort and computer trouble-shooting. There was strong support for Emmett's development in this area, and medium support for the improvement of Kai, Dave, and Jimmy.

C. Technology skills

As previously explained, the specific goal of this project was to repair the Club's computers. Clarise's comment to Emmett that their work had meant a lot to the Club, and her statement to me that the success of the project could be measured in terms of the "change it made for the kids who participated in the programs that utilize the computer room," certainly indicate that group members met this objective. The comments of three of the students indicate they felt they improved their computer expertise in the process. For example, Emmett said "I learned a few things more about the process of trouble-shooting a computer and optimizing and putting in programs and making up menus and so forth;" Kai commented "it gives me lots of experience working with computers," and "we did a new system . . . and I didn't know much about doing but now I have a little bit idea about doing it." As a result, Kai added he was now able to fix his own computer. Finally, Jimmy said they all "learned how to fix those computers."

On the other hand, although Dave did say he had gained experience trouble-shooting computers, he did not specifically make any comments about having improved his computer skills. Rather, in reference to the fact that Dr. Taunton repaired some computers on his own which the students had taken back to school for his help, Dave said he sometimes felt "as if we were just there to transport the computer to our school and let Dr. Taunton do all the thinking for us." In

other words, he seemed to be saying he resented the fact that he lost out on an opportunity to learn from his teacher. In more academic terms, he appears to have identified a lost chance for situated cognition.

To summarize, three of the four students suggested they had improved their technology skills through their project experience. Only Dave did not mention personal improvement in this area, attributing this lack to his inability to work with Dr. Taunton who repaired the computers on his own. Thus, there is weak support for Emmett, Kai, and Dave.

D. Workplace responsibilities

This project provided an excellent opportunity for the group members to become involved in a community of practice. In that they were allowed to enter the Club and work without any adult supervision while being accorded the respect due them as experts in their field, they appeared to be treated as the equals of other Club staff. On one occasion, for example, when the boys were working on the computers, I was struck by the degree to which their niche had assumed similar importance to that of the regular maintenance man, a carpenter, and a tiler, all of whom were also busy on their respective tasks. Later on, these feelings were further reinforced when the maintenance man, speaking to them as equals, asked them if they might have the time to look at some computers at another one of the Club sites.

Through their inclusion within this community, the project group members also experienced the opportunity to learn through exploitation of multiple resources. Thus, besides working directly on the computers they also become involved with a number of different aspects of the Club. One time, for example, in their determination of their need for a specific tool, they were led to the shop of the maintenance man where they were given free rein to take (and return) what they needed. Another day, their work on site resulted in interactions with some young Club members who asked for help playing computer games. Additionally, their involvement with the project meant they had to think about communications in a new way. Since they seldom were at the Club at the same time as Clarise, they came to depend upon the telephone and a system of note exchange as a means of helping to conduct their business.

I surmise that, at least partly as a result of submersion into this community of practice, each of the four students increased his awareness of the demands of the workplace. Kai, for example, stated "before I never worked and now I had a chance to feel what work is like, to start working;" Dave said the project "gives us experience," and similarly, Jimmy told me "I have some, gain some experience." In other words, each of these students made reference to how their project allowed them to learn through an authentic experience which was different from traditional school practices.

Meanwhile, the student who appeared to gain the most in this regard was Emmett. As a result of his leadership role in which "they just elected me and I didn't seem to have a choice about it," he was able to develop in ways not experienced by the others. Specifically, Emmett mentioned that as a result of this role in which he had "the experience of keeping contact with people; . . . I probably have more confidence like knowing how I would go about it if I were to make contact during jobs and so forth, like with the people I am supposed to be fixing the computers for." Furthermore, Emmett also said "he had learned to contact a bit." But, at the same time, he was mature enough to realize his actions had not been perfect:"there could have been a few things I could have done too, like contacting Clarise between times. I didn't keep a close enough contact." Nonetheless, on a final note, Emmett concluded "I probably have more confidence" in this area.

Clarise's observations of Emmett, based upon her exclusive dealings with him in his role of leader, agree with Emmett's perceptions of himself. She felt he had matured over the course of the project, was much more confident in his dealings with her, and displayed a level of professionalism which she thought he would be able to take with him to other jobs:

> I felt that Emmett raised himself by the end and was able to speak to me as another adult so that, if he was able to carry that with him, that would cause him to do things different the next time, with more confidence, with more maturity, professionalism.

Her words, in fact, are very similar to Emmett's description of himself in this regard.

My observations closely mirrored those of Clarise and Emmett. Specifically, I noted that over the duration of the project that Emmett, without my urging, became more willing to phone Clarise and make appointments. At the same time, on those days in which Emmett and I were in the

Technology 12 classroom together, he was much more ready to give me a report on their progress. Also, towards the end of the project, I received one or two unsolicited e-mails from Emmett detailing how things were progressing. In other words, he appeared to learn the importance of maintaining communication, and gained confidence in his ability to do so.

In summary, all four students increased their awareness of the demands of the real world and garnered new authentic experience. However, it was Emmett who through the extra demands of group leader developed most fully in this regard. There is strong support for his growth therein, and weak support for each of the other three students.

E. Project management skills

Planning and preparation were not very visible components of this project. On the first day at the Club, Clarise explained their goal was to "seek unusable computers and use all of the knowledge you have gained to fix it " (Dave), and on consecutive trips to the Club the students determined what needed to be done based upon their interactions with the computers and each other. My regular reminders that they should plan their next trip's trouble-shooting procedures were continually ignored.

Thus, probably because all the students and Clarise felt relatively satisfied with the ongoing results of the project, the lack of planning and preparation was given little consideration. On the other hand, Dave did suggest, in our e-mail interview, that next time they "should plan out on what we should do first, who will fix which computers and if we will have to make programs to make it even more user friendly." Not surprisingly, this statement seems to find resonance with his earlier comment about his unhappiness with the situation in which he was only able to transport computers, not fix them. In other words, perhaps Dave was saying that with better planning he would have had more opportunity to be more productive.

In summary, the development of planning skills was not a major aspect of this project. Significantly, only the one student who felt he did not improve his computer skills suggested more planning would have been productive in this regard. Furthermore, Clarise stated that if she had

realized how productive the boys were going to be, she would have planned to have more computers for them to work on. There was weak support for the development of Dave's planning expertise.

F. Personal development

As with most of students in all of the projects I observed, there seemed to be a direct relationship between the development of personal confidence and individual satisfaction with progress and results, indicated either by the testimony of the student and/or client, and/or by my observance of behaviour changes. This project was no exception. Thus, as previously indicated, Clarise, and I agreed Emmett's actions supported his own perception that in many ways he had become more confident over the course of the project. The following comment by Clarise seems to adequately sum up this change: "I felt that Emmett raised himself by the end and was able to speak to me as another adult." Also, in addition to agreeing with Clarise about Emmett, I felt that as time passed the more relaxed on-site behaviour of both Kai and Dave indicated that they felt more comfortable and confident with their surroundings and themselves.

Additionally, both Kai and Dave made explicit reference to their personal development. For example, Kai's statement "it gives me experience of how to solve the problems yourself and not rely on other people" suggests he gained confidence in himself in regard to developing self-reliance. This self-reliance, I think, in no way contradicts his earlier statements about the importance of being able to work in a group. Meanwhile, Dave's response that the experience "builds up confidence," seems a general assessment of his role in the project as a whole.

In conclusion, the development of personal confidence and individual success seem to be explicitly related. Only one student did not mention he felt more confident as a result of his experience. There was strong support for the growth of Emmett's personal confidence, and medium support for that of Kai and Dave.

G. Service ethos

Although there was no formalized class time for the students to reflect upon the reasons and process of service, all the students made some reference therein during their individual interviews. Kai, for instance, stated "I try to make the boys and girls Club better, make them like, like if you try

to fix computers the boys and girls get a chance to play more so I love to help them do that," while Dave said "I felt happy being able to help other people." Although it is not possible to conclude that these students first realized these feelings during this experience, I think it is fair to assert that any already existing thoughts they might have had in this regard were reinforced. Emmett's comment "it gave me experience doing, helping out" is more difficult to interpret regarding how he felt about giving service, although I do take it to mean than he did experience something new about the issue. Unfortunately, during my interviews, I did not pursue any of these student responses.

Ironically, although Jimmy made no positive comments about the giving of service, he was the student who spent the most time explaining the software to two young Community Club members who happened to be in the computer room one day while the project group was working on the computers. And, it was his hand that one of the young boys briefly held when trying to persuade Jimmy to say behind (when the project group members had to return to school) to continue to help. Thereupon, when I later asked Jimmy about this experience, he said he did not like it because he felt it was not his job and that he should have been working on the computers rather than "playing" with the kids. In other words, as opposed to "playing" with the younger children, Jimmy felt he should have been working at a "serious" task. Thus, it might be argued, that formal discussion and reflection on service might have helped alleviate the confusion and frustration Jimmy seemed to feel about having to help the kids play computer games, rather than do the work that he seemed to think should come first. Such reflection may have helped him come to a different realization about the process of giving service.

To summarize, three of the students did mention how the experience reinforced their views on the benefits of giving service. Surprisingly, only the student who interacted to the greatest degree with the young Club members made no such mention. There is weak support for Emmett, Kai, and Dave in this area.

H. Community of practice knowledge

Surprisingly, even though the students spent considerable time in the Community Club, when I first asked what they learnt as result of their experience as a whole, not one mentioned

anything about the Club, itself. When I did pursue this more specifically with Dave (the only one with whom I did so), he responded that before the project he did not even know of the existence of the Club, and thus everything he learned was new to him. Perhaps, if the group members would have been able to spend more time interacting with a variety of Club staff and/or had been able to experience a number of different aspects of their working environment, they would have reported learning more about their community of practice. There is weak support for Dave's growth in this area.

Conclusions

This project was successful in both its giving of service, and degree of student learning, for not only was Clarise satisfied that she would now be able to make greater use of the computers, but there was significant support for many of the learning outcomes. Reasons for these successes, I think, are as follows. First, the project goals were clearly stated and the students had the skills needed to meet them. Second, all the group members were motivated to work without adult supervision and direction. Third, the students appeared to think their tasks relevant and challenging. Fourth, all the students worked together well. Fifth, Emmett's leadership was instrumental in keeping the group on task, together, and in contact with the client. Although it is possible that if Emmett had not been present one of the other group members might have assumed this role, such a conjecture can not be supported with any certainty.

On the other hand, the learning could also have been improved in three ways. The first is that with appropriate record keeping and planning it probably would have been able to determine that more computers could have been worked on, and thus each of the boys and the Community Club would have received greater benefit. The second involves the role of Dr. Taunton. That is, if it would have been possible for him to work with the students on the computers which were delivered to the school, it seems likely the sharing of his expertise would have resulted in even greater development of the boys' problem-solving and computer repair skills. The third way in which the project could have been improved was through the inclusion of a reflective component (as could all

of the projects) in which the students could have come to a greater understanding of the meaning and process of service.

Another very significant aspect of this project regards the leadership role played by Emmett. The finding that he developed so much more fully than the others in the group suggests the importance of student involvement and the accompanying assumption of responsibility. In other words, his experience seems to bear out the adage "the more you put into something, the more you get out of it." More vital for this investigation, however, Emmett's experience further supports the need for a classroom component in which leadership skills and the delegation of group roles can be taught and discussed.

2. The Western School Support Worker Project

Overview

Project Group Members

Jackson (m), Billy (m).

Project Client

Garth Dawson, Western School Services Support Worker.

Project Goals

To help Mr Dawson solve computer related problems, to customize his computer, and complete computer trouble-shooting as necessary.

Project description

Garth Dawson, a school support services worker at Western School, helps newly arrived immigrants (students) adjust to being at school in a new and unfamiliar country. One of the tools Garth uses to help his students learn English and otherwise become acclimatized is a relatively old computer on which he runs educational programs oriented toward helping with the acquisition of language and mathematics skills. Due to his self-professed ignorance of computers, Garth felt he was not able to offer the students sufficient help and to get the most of the available technology. Thus, he approached Dr. Taunton to see if students might be able to help him to better understand his software and hardware. Particularly, he was interested in having the students check the hard

drive for viruses, delete unused files, load other learning games, show him how to access a number of programs, and customize the computers for him and his students.

Project location

The school support worker resource room at Western Secondary School.

Project logistics

The school support worker project took place in a small resource classroom on the first floor of Western School. The two students left their Computer Technology 12 class to walk downstairs to the support worker classroom. At these times they would spend the whole 85 minutes of class with Mr. Dawson. However, there were also several occasions when Jackson, the obvious leader of the two students, visited Mr. Dawson on his own. Almost all of the work was done by Jackson with Billy serving mainly as a helper or "gopher." Very little work occurred outside the resources room although Jackson said he did some thinking about the project while away from the site.

Site description

The support worker room is a small classroom with two or three tables, a few bookshelves and a variety of other educational and recreational supplies. On one of the tables is a very old computer around which the two students and Garth Dawson positioned themselves during the time they were together. Usually there were no other students in the room when the students were helping Mr. Dawson, but a couple of times students did quickly pass through the room.

Project duration

The project lasted for about two months with Billy working approximately 6 hours and Jackson approximately 10 hours.

Client contact person

Garth Dawson, school services support worker.

Contact person role

Garth usually worked closely with Jackson and Billy. He sat next to them while they were in his room and explained what he wanted. Often Jackson simultaneously tried to teach Garth about the computer and its programs.

Other involved client representatives

None.

Process of project initiation

Garth asked Dr Taunton if there were some students who could help him with his computer problems. Dr. Taunton then presented this opportunity to his class and these two students showed interest.

Researcher's participant role

I had no involvement in the initiation of this project. However, after it began I participated in two eighty-five minute sessions in which I sometimes acted as a "computer language" translator between Jackson and Garth, and also I tried to facilitate a larger role for Billy. Furthermore, on a number of occasions during the Technology 12 class, I spoke to Jackson and Billy about the project, trying to make sure they were keeping on task. I once talked to the boys about how Billy could become more involved.

Researcher's research role

I observed two 85 minute sessions in which the project group worked with Garth on the computer. I also formally interviewed Garth, Jackson, and Billy, and spoke informally with each of them two or three times. The formal interviews were taped and transcribed verbatim.

Total research time

a) On site observations, 2 hours and 50 minutes, b) informal conversations, about 30 minutes, c) personal interviews, 1 hour with Garth Dawson and 15 minutes with each of the students. Total time, almost 5 hours.

<u>Outcomes of Learning</u>

<u>A. Group skills</u>

Collaboration was not a strong aspect of this project. Generally, it was mainly a "one man show." Jackson sat at the keyboard determining what was to be done, attempting to solve all the problems on his own. Meanwhile, Billy was his "gopher" who sat as his side and went to fetch whatever was needed from other parts of the school. Whenever I asked the two of them for an outline of what they had done, it was Jackson who took this responsibility. Similarly, the final self-assessment which Dr. Taunton asked from his students was completed by Jackson, who appeared to have added what Billy had learned (rather than having Billy make his own assessment).

At the same time, there was a significant amount of job-oriented interaction between Jackson and Garth. Generally, this consisted of Garth telling Jackson (and Billy) how inexperienced he was with computers and what he would like accomplished to make things better for himself and his students. However, as Garth had difficulty verbalizing his demands in terms which Jackson understood, Jackson tended to work at the computer and make his own determinations about what needed to be done, more often than not appearing to either ignore Garth or be oblivious to his needs. Garth described the process as one in which "they would sort of come in and do it, and I would sit semi-oblivious."

However, when I interviewed Jackson, I was surprised to find that he made a lot of comments which indicated a relatively mature understanding of the group process. Specifically referring to his disappointment with Billy's lack of involvement (he said he hoped what he was saying was confidential), he stated "I think if my partners know similar amount or more than I do then I would learn more and I think that would be better." Then, in what sounds like a quote from Vygotsky, he continued, "actually I think that more than one people together working can transform their knowledge to another and so is just a way to learn." Although it is doubtful these thoughts were conceived entirely as a result of this community service project, certainly they must have gained credence through the experience. On his final submission for Dr. Taunton, Jackson wrote "he had learned to work with others."

Some of Billy's comments and behaviours also suggest he learnt something about group work. For example, after their first session on site when I realized his role was so minimal, I discussed with the two students the importance of Billy becoming more involved. They both agreed and at the next work session Billy did make an attempt to play a bigger part by helping to give Garth some explanations about what they were doing with the computer. However, when Jackson's much more forceful character interrupted Billy's attempts with his own explanation, Billy reverted to his original quiet and sometimes distracted demeanour. Significantly, though, during my final interview with Billy he was quite adamant that in the future he would like to play a much larger role. He also said he had learnt a lot about computers from Jackson whom he characterized as being an expert in the field. On the final written submission for Dr. Taunton, Billy and/or Jackson indicated Billy had learned "how to work with others."

As previously explained, Garth was often frustrated by the process and, thus, early in our interview suggested that neither student had learned very much mainly because they (Dr. Taunton, Garth, and the two students) had not first "laid the groundwork" of what was to be done and how it was to be accomplished. However, as our interview continued, Garth reflected upon the process as a whole including his observance that he and the boys became more relaxed with each other, both in his room and in the school hallways. Thus, he went on to say that as a result of the whole procedure both Jackson and Billy had probably "improved their communication skills."

In conclusion, then, the group process was not very successfully applied in this project. However, it seems that considerable learning resulted from the attendant failures. Certainly, Jackson voiced some mature thoughts about the potentials of group work, and added he learnt how to work with others. Billy said he learnt by being involved with Jackson, and Garth gave support to the idea that both boys improved their communication skills. Hence, there is medium support for the development of Jackson's group work skills, and weak support for the development of Billy's skills.

B. Problem-solving

Although this project focused very intensely upon trouble-shooting Garth's computer, there is little to suggest there was significant development of either of the students' problem-solving abilities. The only direct comments in this regard were when Jackson made the previously mentioned reference to how people working together can "transform their knowledge," and when, in reference to the trouble he had getting one software program to run properly, Jackson recounted how he tried to solve the problem: "first I think about it by myself, and if I can't [solve it] I talk to some of my friends and, if I can't I go to a higher level like Dr. Taunton." That is, Jackson is explaining the process he used to solve his major problem of the project. Unfortunately, I did not pursue the extent to which Jackson conceptualized his problem-solving abilities through his involvement in the project, but I surmise that as a result of these experiences, they must have, at the least, been reinforced. There is weak support for the development of Jackson's problem-solving abilities.

C. Technology skills

Both students said they had improved their computer skills. Billy said he had learned "to create an icon" by watching Jackson, but never during the course of the project did he demonstrate his abilities, either by choice or because of Jackson's role (and position at the keyboard) as the computer expert. Early in the project Jackson told me that it (the project) was not very challenging because he already knew all about this computer and its software. However, during the final interview he did say he learnt "a little bit about computers," and more specifically, "how to work with Windows 3.1." There is weak support for the development of Billy's and Jackson's computer skills.

D. Workplace responsibility

Jackson's actions and comments indicate he learnt significantly in this area. His most obvious action in this regard was when, after he had thought that the project had been completed, he returned to Garth's room to repair a program which still was not working. This had proved a frustrating facet of the project for Jackson because he did not have the skills to deal with the

problem, and even after speaking with more knowledgeable friends the solution could still not be found. However, he did persevere and eventually, he thought, solve the problem. Much to Jackson's frustration, I later told him that according to Garth the problem had reappeared and suggested he should return to try again. When he told me he did not have the time to do so, I reinforced that, nonetheless, it was his responsibility. A few weeks later, the next time I saw Jackson in the Technology 12 classroom, he proudly informed me he had returned, had fixed the problem, and was happy with the results. Garth later confirmed Jackson had rectified this problem.

This action seemed to add confirmation to statements that Jackson had made in our earlier interview. That is, he said this project was "a valuable experience in applying his knowledge to work," and as a result he learnt "some skill on dealing with people, such as how you should treat your client." Garth's comment "along the way they had better understanding of what my needs were, and that came in the process of me being helpless" supports Jackson's contention.

Jackson also had other comments about the difference between school and work, particularly focusing upon the "empowerment" (my word) that he felt had resulted. Thus, he stated he was motivated by the fact "you can actually control how things work. You can talk to your customer and say I would like, I would suggest to do this. Actually you feel quite good if you are leading." And then, regarding the specifics of the project, Jackson stated he was impressed that being the expert in a work situation lets one "suggest options for your customer." There was strong support for Jackson's development in this area.

Billy, on the other hand, noted nothing about the difference between his project experience and the rest of his school activities. Quite possibly this was the case because the role he played was probably very similar to that in his usual school life. Unlike Jackson, for the most part he remained passive without the assumption of any added responsibility.

E. Project management skills

As far as Garth was concerned, the lack of project preplanning was the main reason that the project did not progress as well as he had expected. He thought "there was a breakdown" in communications between him, Dr. Taunton, and the two students. Additionally, he said that as a

result of poor planning and communication he "felt bad that he [was] so selfish, thinking only about his needs" rather than helping the students cope with their situation. On this same general theme, Garth also went on to say "I feel humbled by the realization that something which seemed so simple on the surface was much more complicated."

Jackson's thoughts about planning were very perceptive, and lent support to Garth's feelings. Generally, he, too, was not happy about the progress of the project because it became too haphazard without any definite direction. Jackson said if he had the project to do over again he would do it "just like how I planned it, like a machine do with inputs." In other words, he was saying either that he (they) should have drawn up a plan and followed it, or he should have followed his original plan. Significantly, Garth thought that "with some reflection they will have learnt about the need for planning and goal setting." To some extent, Garth may have also been projecting his own thoughts here. There is medium support for Jackson's development in this area.

F. Personal development

There are indications both Jackson and Billy made gains in this area. For instance, the fact Billy said that next time he would be able to, and would like to play a bigger role could be seen to be suggestive he was feeling more confident. And, Jackson's response to my question about what motivated him to keep going certainly portrays feelings about personal responsibility: "It's a project I have to do, I talk to him and then after that I think it is like my duty. After that I think it is necessary for me to finish the job-it's like a mission-it's a small mission."
Subsequently, Jackson's previously explained behaviour in which he returned to the work site to fix the problem which he originally thought was rectified showed he acted upon these beliefs. There is medium support for Jackson's development of responsibility.

G. Service ethos

During my interviews, both students made reference to their feelings about giving service to Garth. Specifically, Jackson said "I feel happy if I can help him," and Billy replied "I think the best part of the project is to help Mr. Dawson fix all the stuff." Billy also stated he was happy because he learned "how to help people when they are in trouble." Unfortunately, the lack of a

reflective component resulted in a missed opportunity to further explore these perceptions. However, these statements do suggest there is weak support for both the students in this area of development.

H. Community of practice knowledge

Although both the students spent considerable time in the resource room with Garth, they only had two very brief opportunities (about five minutes in total) to observe him interact with a couple of his students who were passing through the room. I assume it was based upon these short experiences that Jackson and Billy, respectively, concluded "what a hard job he [Garth] had and how much patience he needed for his job," and "well, I didn't know before but now I know . . . that he has students." In other words, although the contact was fleeting, they learned something about Garth, his job, and his students. There is weak support for both students.

Conclusions

This project was particularly instrumental in its conveying to the students, to Garth, and to me the importance of planning, communication, student inter-relationships, student role, and expectations on students. Although the project did result in some significant learning outcomes, certainly it could have been very much improved through adequate preplanning and ongoing conversation regarding the processes by which Garth's needs could be best met. Additionally, if the strong discrepancy between both Jackson's and Billy's skill levels and force of personality had been recognized, perhaps they would not have been teamed together. And even if they had begun together, proper ongoing communication between Garth and Dr. Taunton surely would have resulted in some attempt to remedy the situation (one of the few statements by Dr. Taunton about any of the projects was that he should have realized Jackson and Billy should have not worked together).

As with the previous project, this one also showed how the opportunity for student leadership is so important to student development and related learning. At the same time, however, the disparity between Jackson and Billy, and the communication gap between Jackson and Garth emphasized how crucial it is that our expectations of students are realistic. Without any direction

and/or expertise, there is no reason to think Jackson should have been able to assess his and Billy's roles and make the necessary adjustments. Furthermore, it was also unfair to assume that Jackson had the necessary skills to respond to Garth and give him satisfactory lessons on computing.

Finally, as previously mentioned, the lack of a reflective component resulted in a lost opportunity for the students to pursue ideas about service. Furthermore, reflection time might have provided a chance for Garth to better deal with some of his frustrations about the project as a whole, and his perceptions regarding why he felt he was to blame for many of its shortcomings. In conclusion, then, not only was this project able to promote a certain degree of learning but at the same time it also demonstrates that in order to reach its potential such learning must be accompanied by student and teacher reflection, and proper communication between all those concerned.

3. The Hospital School Room Project

Overview

Project group members

Wilson (m), James (m)

Project client

Metropolitan Hospital.

Project description

The purpose of project was to trouble-shoot the computers in the school room for adolescent medical patients and in the school room for pre-adolescent psychiatric patients. Tasks included the removal of viruses, cleaning hard drives, loading new programs, customizing menus, and installing RAM. Additionally, students were asked to teach certain patients and staff how to use specific hardware and software items, and means of using the Internet.

Project location

Metropolitan Hospital, about six kilometres from Western School.

Project logistics

The two students spent one week on site, from 9:00 am to 3:00 pm daily. They travelled to the site by Wilson's automobile. Although they usually worked separately, Wilson and James always had lunch together in the hospital cafeteria.

Site description

The hospital project occurred in two closely connected childrens wards of the Metropolitan Hospital. One of the students, Wilson, spent the majority of his time in the "school room," a large room in which teenage patients were able to keep up on their school work while in the hospital. The room housed a variety of chairs, tables, bookshelves and about eight computers used mainly for the playing of educational games. At different times there were different numbers of patients and staff in, or passing through, this room. For example, at any one time during the morning here might have been eight patients and four staff in the vicinity, while in the afternoons, generally there were no patients in the school room.

The other student, James, spent most of his time in the downstairs school room attached to the child psychiatric ward. Housing a number of tables and chairs, two computers, and two full time staff, this school room tended to be fuller and busier than the one upstairs. Attached to this room was a smaller office in which one computer was connected to the Internet. Sometimes James worked in this room with one of the patients, showing him or her how to use the Internet. Besides the times in these areas, Wilson and James also spent some time in the office of the head teacher, showing students and staff how to use the Internet, and fixing the computer. Wilson also spent a short amount of time in a hospital room with a severely burnt young patient.

Project duration

30 hours, over one work week

Client contact person

Judy, the head teacher in the school room.

Contact person role

Judy is the head teacher in the school room. Sometimes she worked directly with one or both of the young men, although generally she "delegated" the students to other ward staff who supervised them more closely. Most of the time, Wilson worked on the ward with Judy, and James worked in the downstairs child psychiatric school room ward, more directly supervised by the teacher, Kay, and the teacher aid, Caitlin.

Other involved client representatives

The other teachers and teacher aids with whom the boys worked were Thomas, Mary, Patsy, Kay, and Caitlin. Wilson also had a short but profound encounter with a hospital maintenance person, and both boys had the opportunity to briefly work with a hospital computer technician while he was repairing a computer.

Process of project initiation

This project was initiated by Dr. Taunton, in his capacity as school work experience supervisor and Computer Technology 12 teacher. Dr. Taunton's past experience as a volunteer worker at the hospital enabled him to initiate contact. After he arranged the logistical details, I met with a number of the ward staff to discuss expectations and explain my role as facilitator and researcher.

Researcher's participant role

During the week that James and Wilson spent at the hospital, I spent about eight hours observing and participating in a number of ways. Mainly, I helped Wilson with the Macintosh computers with which he had no experience, and offered support on a few other matters. However, the majority of time the boys worked on their own, and I only watched and sometimes chatted with them and the hospital staff.

Researcher's research role

I observed the boys for about eight hours, during which time I also frequently chatted informally with some of the hospital staff. After the project was completed, I interviewed Judy, Wilson, and James. These were taped, and transcribed verbatim.

<u>Total research time</u>

a) On site observations, 8 hours, b) personal interviews, with Judy 25 minutes, and with each of the students, 20 minutes, c) other discussions, a 45 minutes introductory discussion with the hospital staff. Total time, approximately 10 hours.

Outcomes of Learning

A. Group skills

Generally, Wilson spent most of his time with the staff and children on the ward for those with physical maladies, while James did the same one floor below on the psychiatric ward. Hence, instead of spending a lot of time together, each became more involved with his specific community. As such, the expert help and direction from Judy and other hospital staff allowed Wilson and James new experiences teaching and working with the hospitalized youth. Thus, regarding the development of group work skills, Wilson said he had learned "how to teach the children, play games, playing with them," and James emphasized he had "learnt interrelations, interpersonal relationships and things like that . . . also about communicating." Correspondingly, Judy's analysis was, "I think the first day was quite bewildering, and I think by Friday at the end of the week that they were feeling more as part of the team." And, when I asked Wilson, how he felt about not being able to work with James, he answered, "I didn't feel alone, but I was mainly working by myself."

However, the boys did get to spend some time together, and helped each other. On one occasion, for example, I arrived shortly after lunch to find Wilson and James bent over a computer trying to determine why it was not working properly. Originally, Wilson had been doing some work on it when it had ceased to function properly, and then at lunch he had obviously mentioned the problem to James who later came to his aid. It was occasions such as these, I imagine, which were the source of Judy's remark that "I think that they consulted one another outside of the time here because certainly they knew what one another was doing, and if one was working on a project and another thought they could help him, they would." In other words, according to the particular

situation, whoever was the most skilled would help the other, or both would simply put their individual minds together in an attempt to arrive at a collective solution.

Meanwhile, my observations supported the statements of the students and Judy. For instance, I had also observed over the course of the week that both the students had become much more comfortable on their wards. I was particularly impressed while watching Wilson working closely with a severely burnt young patient one day, and his later mention of how he felt comfortable and thought he had helped the patient stop thinking about his problems. Although James did not get the opportunity for such a profound interchange, I noticed when he first arrived at the hospital he was quite timid in his interactions with the patients, but as time progressed he began to initiate conversations. Similarly, Kay (the teacher) and Caitlin (the aid) agreed how much he had improved his teaching and relating skills over the course of the week.[12]

In conclusion, then, though Wilson and James were at times able to work together to solve problems, most of their group-related learning resulted from new experiences working with the hospital patients. Thus, besides being able to rely upon each other, they were able to take advantage of the special skills of the hospital staff to develop and improve group work skills which were totally new to them. Correspondingly, Wilson stated the best part of the job was working with the children "because it was a good experience," and James concluded one of "the most memorable parts was helping out the children there." There is strong support for the development of both students' group work skills.

B. Problem-solving

There is also evidence suggesting both young men improved upon their problem-solving abilities. Just the fact they faced and mastered many of the aforementioned problems must be an indication of their advancement. Certain comments by each of the students appear to add confirmation. For example, when I asked Wilson to reflect upon how he went about solving the problems he faced, he answered "sometimes I had to solve it by exploring . . . I learnt a lot by

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12. Neither Kay nor Caitlin wished to be formally interviewed but offered this comment in a brief, informal conversation.

exploring." Although, he did not directly say so, I got the feeling he was implying this exploring was something which he was not used to doing.

Meanwhile, when I asked James what he liked least about his project experience, he said it was when "they ask you do something very hard, something that exceeds the ability of the computer to do," and he had to find a way to explain that "they expect too much, actually the system can't do something like that." My inference from this is that James found himself in a very difficult and unusual position of, first, having to confidently determine that what was being asked of the computer was not possible, and second, without appearing to be incompetent, communicate this message to whoever wanted the task done. Thus, he had to solve a difficult problem with which he probably had no experience, and as a result, I would suggest, he improved his problem-solving abilities.

Based upon the complete testimony of all the stakeholders regarding the tasks and accomplishments of the students, it might be argued there is strong support for the development of both of the students in this regard. However, based only upon direct reference to problem-solving, I must conclude there is only weak support for each of them.

C. Technology skills

One of the reasons why this was such an effective project was that besides being able to develop their new people-related skills, both the students (in the course of trouble-shooting the computers and teaching related skills to staff and patients) also learned a significant amount about computers and computing. Their comments in this regard include "I don't have any experience with it [this operating system] before but because I deleted something in the hard drive and it disappear, I still have to say that I will fix it, through the help functions and things I found out how to do it" (James), and "[I learnt] about Macintosh (Wilson)."

The observations and comments of both the researcher and Judy supported the testimony of the two students. For instance, Judy said specifically about Wilson that "he learned a lot about Macintosh which he didn't know anything about at the beginning," and about both the boys, she added "they learnt about certain aspects of computer trouble-shooting." Correspondingly, over the

course of the week, I noticed both boys were working much more confidently at the computers, sometimes working on two machines at once and trying things which they would never have attempted in the first couple of days.

On one memorable occasion Wilson and James improved their ability to disassemble a computer and install more RAM. To illustrate, after being asked by Judy to install extra RAM in her computer, Wilson began by attempting to remove the computer's cover. However, no matter what he tried, he could not remove it. Thus, Judy phoned a hospital computer technician who, while Wilson and James were watching, removed the cover, installed the RAM, and then replaced the cover. However, when the boys then attempted to restart the computer they found it was not running correctly. Thereupon, the two students removed the cover once more and determined both that the RAM had not been installed correctly and that the inside of the computer needed cleaning. As it was now time for them to leave the hospital for the day, they returned early the next morning, James with his vacuum cleaner from home, and completed the task.

To conclude, because of the variety of computer-related activities in which the boys were involved, and the authentic problems to which the students were subjected, they improved upon their already substantial computer skills. There is strong support for the development of both students' technology skills.

D. Workplace responsibility

Another strong aspect for both students concerned the development of their awareness of how the real world is different from school. Generally, this growth can be related to the boys' position of being seen as the "computer experts" in a real situation in which it was obvious that mistakes could have a serious effect. Thus, for example, when Wilson was looking back at his experience as a whole, he first stated "it is different at school, if I have a problem I can ask somebody and at the hospital I had to figure it out by myself," and later he added "at the hospital, I have to work on my own and everything I do I must solve by myself and at school I can ask many people to help me, the teachers or classmates." Similarly, in an informal conversation we had while

walking from one ward to the other, James told me he had learned about real world responsibility and commitment, and how being at work is different from being at school.

These statements of the students do not stand alone. For example, Judy commented "I think that both of them learned you have to really think of other issues too and be quite responsible." Additionally, I noted a number of occasions when the actions of both the boys bore out their testimony. The most profound event concerned the previously described situation in which Wilson and James installed the RAM in Judy's computer. Prior to actually doing the installation Judy told a hospital maintenance person who just happened to be in the area at the time what they would be doing and asked to borrow a screwdriver for the task. His extreme reaction of a very loud and intimidating questioning of Wilson about his confidence that such "tinkering" would not bring the hospital's whole electrical system to a catastrophic halt, left us all quite surprised and shocked (although Wilson later told me it did not particularly upset him).

After some discussions among ourselves, and Judy's phone call to the head of computing, it was determined this job posed no such danger, and Wilson should go ahead. However, mindful of the responsibility and possible repercussions related to working in the real world, he then went about his task with extreme diligence by making sure, each step of the way, that he would not jeopardize the integrity of the whole system. Importantly, after the job was completed, Wilson told me he came to realize that on a real job there is no one to "pick up after you."

In conclusion, all the evidence indicates strong support for the development of both James's and Wilson's awareness for how work demands differ from those associated with traditional schooling. It seems reasonable to suggest that, to some extent, this development is due to the seriousness of the situation in which the students found themselves.

E. Project management skills

Because the hospital staff was so organized, neither Wilson nor James had to concern himself with any kind of preplanning or task preparation. Thus, there was no evidence of any degree of development in this area. All the planning was done by the hospital staff and Judy who

commented that one of the reasons things worked out so well in this regard was because "the skills that they [James and Wilson] listed [on their resumes] were skills they were able to use."

F. Personal development

Both Wilson and James developed personally in a number of ways over the course of their project. First, in our interviews they both commented upon how they had learned things as a result of their opportunity to work closely with young people, and having to work on their own. For example, James thought he had learned "patience and something like that." Similarly when Wilson, said he was pleased "because he had to learn it by himself," he was implying he had gained confidence in himself through the process of having to rely upon himself. Also, Wilson's comment he preferred the hospital to his other work placement because he felt needed, perhaps indicates his realization of the need to feel useful and productive: "like through the hospital I have to do something that they don't know how to do, but if I go with some other computer company, I do not like to do it because they actually don't need my help."

Judy also stated she thought both the boys had developed personally. For instance, her remembrance of Wilson's teaching experiences with a couple of patients in particular indicated that he had gained confidence:

> I think he felt more comfortable around the children as the week carried on. He was quite often asked by a couple of specific students that he got to know quite well over the week to help them with problems they were having with the computer and at first he was a little shy with them and after a while he seemed to be very pleased that they had consulted him.

Because she had not worked closely with James, Judy was not able to give the same degree of affirmation about his development. However, she did repeat that she thought both of the boys had become more confident and responsible as the week progressed.

My observations concurred with those of Judy, and the testimony of James and Wilson. Over the duration of the 30 hours at the hospital I had become aware of how much more relaxed, outgoing, and conversational the two had become. For instance, instead of me (or someone else) asking questions and the two of them answering in monosyllables, they both initiated conversations and became much more visible and productive ward members. With all this in mind, then, there appears to have been strong evidence for the personal development of both students.

G. Service ethos

Other than the observation that both James and Wilson became more involved and relaxed with the patients over the week, it was not possible to determine from their behaviours how they felt about the opportunity to give service. However, their respective comments during my interview did certainly clarify the matter. For instance, James was adamant that "the most memorable part was helping out the children there." Specifically, he then added "because I can experience teaching, helping out after which you feel quite good; I was quite proud." Similarly, Wilson thought the best part was "I can be in touch with some other people, children."

In conclusion, I think that since both boys had such strong feelings about the opportunity to help, it would be difficult to argue they had not significantly developed their perspectives on the giving of service, particularly toward children. Thus, there was weak support for both students in this facet of development. Unfortunately, the absence of a reflective component deterred any further discussion in this area.

H. Community of practice knowledge

Perhaps I did not ask the right questions, but I do find it surprising that even with all the time the students spent in the hospital at such a variety of situations they had little to say about what they learnt about their community of practice. The only perspective offered was from James when he commented upon what good work the hospital was doing:

> I think that the staff are doing their job very well, for example they have to be very patient to confront with those kids in the psychiatric unit, but you could not sense the atmosphere of a school going on. On the overall, I think it is a very good place for children and adolescents to keep up with their school work during their recovery stages.

There is weak support for James in this area.

Conclusions

This was a successful project for all who were involved. Not only did the hospital and its patients benefit, but the students learned in a number of different areas. Particularly significant in this regard was the role played by the hospital staff who were understanding, directive and appreciative. Because of their tutelage both Wilson and James were able to experience situations

which were not only novel, but also memorable and educational. Also, the fact the students realized the possible serious consequences of any error was instrumental in their development. Thereupon, they could appreciate the importance of their involvement.

As reported, only in the area of planning did there not appear to be any student growth. I would argue the reason for this is that in many ways the work of Vincent and James was more similar to that of salaried employees than those working on a self-defined project. Although the results of this arrangement were more than satisfactory, I can not help thinking the two students missed out on an opportunity to learn about the importance of planning and self-direction. Perhaps one solution to this dilemma (in general terms) is through the opportunity for students to become involved in a number of projects, all with different attributes.

There was a greater degree of evidence for learning in this project than any other in my investigation. There were probably various reasons for this. I think the most obvious is the students were capable and the staff was exceptional. However, the fact the environment was so unique, challenging, varied, and relevant must have also played an important part. Thus, it is clear the situated contexts need to be carefully chosen, but it must also be kept in mind that the actions and interactions of the experts/adults within those contexts are equally integral to learning.

4. The Hospital Adolescent Psychiatric Ward Project

Overview

Project group members

Lenore (f). (Note: The student who was scheduled to work with Lenore withdrew from school slightly before the project was to begin, and thus Lenore was left to work on her own).

Project client

Metropolitan Hospital.

Project description

The purpose of this project was to trouble-shoot the computers in the school room for adolescent psychiatric patients. As such, tasks included the removal of viruses, cleaning up hard

drives, loading new programs, and customizing menus. Additionally, Lenore was asked to teach certain patients how to use specific educational software applications, including the Internet.

Project location

Metropolitan Hospital, about six kilometres from Western School.

Project logistics

Each day, for three days one week and two days a few weeks later, Lenore made her own way to and from the hospital.

Site description

This project was initially scheduled to occur in the same wards as the previously described hospital project. However, due to a shortage of tasks, Lenore was quickly moved to another spot in the same hospital, the teenage psychiatric ward school room. In this room, housing a number of tables and chairs, bookcases, and three computers, she worked closely with the two staff and approximately eight patients. At times, Lenore also worked alone in the ward office, on the teacher's computer.

Project duration

This project lasted for 30 hours over two different weeks. Specifically, Lenore worked for three days, 9:00 am to 3:00 pm, for the one week and then a few weeks later came back for two, six hour days. This split occurred because of a conflict between Lenore's school demands and the hospital schedule.

Client contact person

Deirdre, the ward teacher.

Client contact person's role

Deirdre was the only teacher on the ward, although Marcia was her full time teacher aid. Generally, Deirdre was responsible for the educational program for each of the patients who worked on his/her school work in the school room. As such, she set out the individual programs for the day, taught group and individual lessons, and supervised the classroom activities.

Other involved client representatives

Maria, the teacher aid, and Mary and Patsy, teachers in the "school room" ward.

Process of project initiation

The project was initiated due to the success of the previous hospital project. Thus, both Dr. Taunton's and my conversations with Judy led to the establishment of this project. Dr. Taunton coordinated the final details about when Lenore would begin and what her duties would be.

Researcher's participant role

As a participant, I spent most of my time talking with Lenore about a number of matters, some unrelated to her duties at the hospital. I also helped her with a few small technological problems with which she had to cope. I also spent time speaking with the two staff on the ward.

Researcher's research role

Besides my observations and interactions with Lenore and the hospital staff, I personally interviewed Maria, Deirdre, and Lenore. All interviews were taped and later transcribed verbatim. I also interviewed Midge for about 5 minutes and Pat for 2 minutes over the telephone, and then made brief notes on these conversations.

Total research time

a) On site observations, 7 hours, b) personal interviews, with Lenore and Maria 15 minutes each, with Deirdre and Midge 5 minutes each, and with Pat 2 minutes. Total time, approximately 7 hours and 40 minutes.

Outcomes of Learning

A. Group skills

Because the young man with whom Lenore was originally teamed had quit school just before the project was to commence, she was in the relatively difficult position of being unaccompanied at the hospital. Thus, though she had the support of the hospital staff around her, she was not able to enjoy the comradeship and support of a schoolmate, nor benefit from peer expertise. To some extent this may have been a factor in the very quiet and shy manner which Lenore often exhibited while on the job. However, it might also have been due to Lenore's

personality, and/or because of her transfer between wards that it took her slightly longer than other students to develop the kinds of relationships which potentially ensue from more consistent interactions.

As Lenore was able to work within a number of different contexts, she was given the opportunity to interact with a variety of communities within the hospital as a whole. And though there were few persons to whom she could go for guidance regarding the technological aspects of her job, the fact she was among people whose expertise lies in human interactions was particularly significant. It quickly became apparent Lenore's greatest need was for help in just that area. For example, Deirdre's observation Lenore was very scared when first arriving at the adolescent psychiatric ward (Deirdre said it was her job to notice such things), was able to be followed up with appropriate, but subtle, direction and help. Much of it aided Lenore to become more comfortable as a member the ward in which she came to spend most of her time.

Most of her four days in the adolescent psychiatric ward Lenore spent helping three students learn how to use some educational software, and the Internet. She would sit in the school room interacting with one student at a time while all the other students in the ward worked on their own assignments. All the while, Deirdre and Maria were in the room helping the students and sometimes giving direction and support to Lenore. When not working directly with the students, Lenore worked on the computers. She usually sat at one of the computers in the school room or once or twice she laboured alone in Deirdre's office at her computer.

Lenore made great strides in the development of her interactive faculties, particularly in light of how insecure and timid she appeared when first arriving at the hospital. In fact, a number of the staff with whom she worked on the ward where she spent her first day were so concerned that they were not sure if Lenore would be able to offer them any help at all. However, on her second day she "found a home" on the adult psychiatric ward, and with the help of Deirdre and Maria matured most significantly.

I observed a number of positive changes in Lenore over the duration of her project. Generally, although her outward appearance did not change greatly, there were signs she was

becoming less introverted. For example, near the middle of the project, I made the following note about our conversation when we were walking off the ward at lunch:

> She really seemed to come out of her shell, asking me about courses at UBC and answering my questions about her school marks. She comes across as having a lot of potential but being very timid and, thus, needs to be drawn out and be given ideas about the world.

At the same time, the changes in her demeanour when working with individual students was equally noticeable. For instance, concerning her interaction while helping a mentally challenged student, I wrote, "she starts out very tentatively and quietly but soon she becomes much more involved; her body language changes." Similarly, on another occasion when she was working closely with a different student, I noted,

> When Lenore begins working with one of the students (on some math software, as indicated by Deirdre) she is much more interactive, happy, and animated (she smiles, talks, gives directions, answers questions). Body language is much more relaxed (arm on chair of other student, heads together).

Both Deirdre and Maria also commented upon the changes in Lenore. Originally seeing her as "very quiet and, I wouldn't say shy, just quiet and sort of reserved" (Maria), and "very shy and very hesitant and anxious about being in a different setting" (Deirdre), they later observed quite a different person. For example, Deirdre said "certainly she came much more comfortable, much more at ease; when she came back her second time for the second set of days, she was much more relaxed, much more interactive with the other kids." And more specifically, Deirdre also reported that Lenore learned "everyone has individual needs and would respond to them in regard to their individual needs as well." Similarly, Maria observed "she came out of her shell a little bit and was a little more at ease and more willing to engage with other people." About her interactions with a particular student, Maria added "she was very willing to engage with this young guy and go through the game with him, a math kind of program, and she helped him go through the steps and actually came a little more out of her shell with that interaction."

In our interview, Lenore also made many comments which supported the previous contentions of the involved adults that she had improved her interactive faculties. One of her comments, for example, is remarkably similar to one of Deirdre's comments: "I learnt some skills to work with people in different ages, [I learned] communication." Lenore also made an interesting

comment about what she learnt about how teaching people is different than working with machines: "much more different, you need the teaching skills to teach others, if you just work on the computers you just use something you know, they are two different things."

In summary, the evidence suggests Lenore's development in this area was profound. Although the reasons for this are probably manifold, I would suggest it was mainly due to a unique combination of a shy but determined student, supportive staff, and willing and accepting patients. There is strong support for the development off Lenore's group work skills.

B. Problem-solving

In conjunction with my observation that she had to solve a number of computer-related problems on her own, Lenore's testimony implied she had improved her problem-solving abilities. For example, in response to my question about what she learned about computers, Lenore proudly replied she had learned because she had to do things she never did before:

> I remember they ask me to delete and file. I just used the computer to search that file and I didn't do that before but I tried to do something and I solved it. They gave me a question and I don't really know the answer and I tried to search on the computer and I got the answer.

In other words, more than just learning about the computer, she seems to be saying she had learned to solve a problem by attempting something she did not previously know how to do. At the same time, she appears to be proud and confident enough of her accomplishments to try the same action some time in the future.

My other observations of Lenore also suggest she improved her problems solving abilities. For, while I was watching her teach the mentally challenged student how to use particular software, I noted she sometimes had to try a number of different approaches before he fully understood. Thus, upon the realization that one approach was not entirely effective she would choose another which she hoped would achieve the desired effect.

In conclusion, although the case is not quite so obvious as with some of the other projects, I think that there is medium support for Lenore's development of her problem-solving abilities. Most particularly, I think the remembrances of these successes will encourage her to attempt, in the future, to solve problems which she might not otherwise have dealt with.

C. Technology skills

As a result of her work trouble-shooting the ward's computers, Lenore felt she had improved her computer-related abilities. Besides the above mentioned example, Lenore also added "I think at school I do more on the books or on programming but in the hospital I really worked on the program or work on the software. These are two different things." In other words, she is saying that whereas at school she dealt with computer conceptualizations, at the hospital she had to use them at a practical level and as a result she actually learned how to use them. Lenore, on her final submission to Dr. Taunton, also wrote she learned *"to work with Mac computers."*

As a result of one of my interactions with Lenore, she also added to the development of her computer skills. When I arrived for my first observation I found Lenore trying to determine what was wrong with a computer that she had been asked to fix. As she did not know how to proceed, I suggested she disassemble the mouse for inspection. I was surprised she did not know how to go about this very easy task which did result in us finding and correcting the problem of a dirty tracking ball. I assume she will remember this simple procedure and will have added it to her trouble-shooting repertoire. In conclusion, then, there is medium support for Lenore's computer skill development.

D. Workplace responsibility

Due to her experience in this authentic, real world situation Lenore came to a number of new realizations about work. For example, about the overall experience of combining school with a work experience component, she said "it would give the student some idea of what such a job will be exactly like and I think every job will be different from what students are learning in school so it will be a very good experience." Also, Lenore had two things to say about what she learned regarding the real world aspects of teaching and working on computers. To illustrate, concerning the difference between teaching and computing, she said that they are "much more different, you need the teaching skills to teach others, if you just work on the computers you just use something you know, they are two different things." And, in this light, Lenore had the following to say about

her prospects for teaching: "the experience let me know I really like to work on computers, and I think teaching is much more harder than just working on computers."

In summary, Lenore learned about how school and work are different, but complementary. She also came to a realization about the skills needed for teaching, the difficulty of teaching, and her desire to continue working with computers. There is weak support for Lenore in this skill area.

E. Project management skills

As with Wilson and James before her, the organization and direction offered by the hospital staff did not allow her to have to make any significant planning decisions, or do any planning or organizing. Thus, she offered no comments in this area.

F. Personal development

In conjunction with Lenore's many successes while on the ward, she displayed a profound growth in personal confidence. Hence, in addition to the previously reported comments by me, Deirdre, and Maria about the improvement in her interactive abilities and resulting show of confidence, Lenore also made a number of statements which added further support to the evidence. First, when I asked Lenore if she might have some advice for someone else coming to do the same job as her, she replied "first of all tell them that it [this job] is not hard to do and that you do not have to be nervous, take it easy and go to the hospital and you will know." That is, she seems to be saying that this person should not worry, that the job is not that difficult and the people there will help. This attitude is in stark contrast to Lenore's first appearance on the ward.

Lenore also made some comments which indicate that even though she never thought of teaching before, and she realized how difficult it is, that she might like to try it some time in the future. These statements included, "I think it was a very special chance for me; in the future I might not have such a chance to do such a thing again. Even though I take computer science I just get a job with computers and this is a very special chance for me to teach others," and "but I think I like teaching, but I don't know, in the future if there is a chance for me in the future I will do some." Thus, Lenore seems to have gained enough confidence to consider alternatives to a path which she had previously automatically assumed. Finally, when I asked Lenore if she had become

more confident as a result of this experience, she quickly and emphatically answered "yes." There is strong support for Lenore's development of personal confidence.

G. Service ethos

Lenore made a number of statements which indicate she had given thought to the giving of service. Besides her aforementioned comments that she found the opportunity to teach a special experience which she thought she "might not have such a chance again," Lenore said she was happy with her time at the hospital because it gave her "a chance to work with others . . . teach others some things." This enjoyment and interest in teaching is supported by Maria's perception that Lenore was "very willing . . . quiet, but not hesitant to engage with us . . . interested in being here." There is weak support for Lenore's development of a service ethos.

H. Community of practice knowledge

Lenore made one assertion which indicated she had learned something important about her community of practice. That is, in regard to her perception about the young persons on the psychiatric ward, she said "they cannot respond well or they may have some problem but I think they are OK, not as bad as I imagined before." In other words, her previous idea that the people on such a ward were much different than the average person (a perception that many people might hold until their experiences tell them differently), was dispelled. Certainly, this is an important lesson for everybody. Because I feel that such a conceptualization, in itself, infers learning, there is medium support for this learning outcome.

Conclusions

What I found particularly memorable and exciting about this project was the degree of satisfaction and enthusiasm emanating from Lenore during our final interview, more than that expressed by any other of the Technology 12 students. This is particularly significant when contrasted with the non-vocal, almost timid behaviour which Lenore displayed during much of her time on-site, particularly during the first days of the project. This change, I determined, was due to a number of factors, with the most important being the skills of the staff who recognized her needs and were able to respond to them accordingly. Hence, Lenore's experience was particularly

productive and happy for her with the result that she gained a great deal of confidence in herself. Also, I would guess that the fact she was the only student in the class who had to go her project on her own (and succeeded), must also have been a strengthening factor in this development. Concurrently, the hospital also benefitted. Not only was she "great to have in the classroom" (Deirdre) to help with the students but "she was able to show us a few things that help run our computers more efficiently" (Maria).

As with all the other projects, there was no reflective component. In this case, though, I think this was specially unfortunate as any opportunity for Lenore to participate in further discussion about her experience would have been extremely useful for the reinforcement of her learning, particularly regarding her growth of personal confidence. I feel this to be the case because she had no peer with whom to share her experience on-site, and because Lenore showed so much development and potential with the experience she was given, I believe that even greater opportunity would have continued to be very productive for her.

<center>5. The Grade Three Web Page Project</center>

Overview

      Project group members

      Delores (f), Rosie (f)

      Project client

      A grade three class at City Elementary School.

      Project description

The two students were enlisted to work with the grade three class and their teacher to develop an Internet site for their class. As such, their task included working with the class and teacher to determine the content, layout, and process of presentation of the site. However, after the first one hour session, the project was terminated by Mrs. Smith, the teacher. At that point the two students had spent about 15 minutes in the school library observing the principal and Mrs. Smith trying to get permission from the librarian to use the library computer, and 45 minutes in the classroom with the whole class and Mrs.Smith discussing the makeup of the web page.

Project location

An elementary school on the other side of town from Western Secondary School

Project logistics

The two students made two trips to the site before the project was abruptly terminated by the grade three class teacher. On the first visit they went with Dr. Taunton to discuss with a number of teachers the possibility of instigating a project; on the second trip in which they began their project, they travelled on their own. The students also spent time at school and at home thinking and talking to each other about their plans.

Site description

The two involved students worked for about 15 minutes on the one computer in the school library, and for 45 minutes in the grade three classroom with the class and their teacher. Both of these sites were similar to those found in a typical elementary school.

Project duration

The project lasted for about two weeks over which the students spent a total of 1 hour on site, 30 minutes in a preliminary planning discussion at the elementary school, and approximately 2 hours planning at their own school.

Client contact person

Mrs. Smith.

Contact person role

Mrs. Smith was the grade three class teacher. She was mainly a bystander in the project activities.

Other involved client representatives

The principal of the school, and the librarian played brief, but significant parts.

Process of project initiation

The project was initiated by Dr. Taunton through discussions with the principal of the school where his daughter was a student. Thereupon, Dr. Taunton and the two students met with a number of teachers to determine if there was interest in initiating a technology project. At this

meeting the project was determined and at a later date I was informed by Dr. Taunton of its starting date.

Researcher's participant role

I spent two hours in the classroom. During the first hour (I arrived before Delores and Rosie did), I spoke with the class and their teacher about possible ways of approaching this project. The second hour, for part of the time while the two students were working with some members of the class, I interacted with other class members. I also talked with Mrs. Smith for about five minutes about why she had terminated the project.

Researcher's research role

I observed Delores's and Rosie's session with the class. After the project had been terminated, I interviewed both Rosie and Delores. Both interviews were recorded and transcribed verbatim.

Total research time

a) On site observations, 1 hour, b) informal conversations, 5 minutes, c) personal interviews, with Rosie, 20 minutes and with Delores, 40 minutes (I interviewed Delores twice because during the first interview, my tape recorder stopped working). Total time, 1 hour and 45 minutes.

Outcomes of Learning

A. Group skills

The whole of this project was based upon interaction between Rosie, Delores, and a array of others. It began with a group meeting with many of the school's teachers to first determine what kind of project might benefit the school, progressed to an aborted collaboration between the school librarian, the school principal, and Mrs. Smith in the library, and culminated in a 45 minute web page design session involving Delores and Rosie, all of the grade-threes and Mrs. Smith, in their classroom. Unfortunately, however, it was the failure of the library collaboration (when the librarian did not allow the two students to use the school Internet connection to proceed with the already planned first step of their project) which had a major role in Mrs. Smith's later decision to conclude the project after just one hour. She stated she ended the project because she felt she did

not have the support of other teachers in the school. As a result, Delores and Rosie were denied an opportunity to continue with a project which, based upon the success they had experienced in their brief session with the grade-threes, looked promising for all concerned.

Despite the abrupt termination of their project, both Delores and Rosie said they had learned something about group work. Delores, for instance, said that because her mother is an elementary school teacher she has often gone into class with her to help individual students with their work. However, she added, that as a result of her and Rosie's leadership of the grade three class (Mrs. Smith was mainly an onlooker) she had realized how different and much more difficult it was to lead a whole group: "normally the stuff I did with my mom is one-on-one helping the kids with their stuff, and this is probably the first time I that did it with a really large group."

Similarly, Rosie's comments emphasized that although this group experience had been very short, she had learned a significant amount. Regarding working with the grade three class she said she learned "it is really important to do group work and it taught me how to work not only with people in my age range but also with people, like, younger than I was, and it taught me to be really patient with them." And, ironically, as a result of observing the lack of cooperation between the adults in the library, Rosie asserted she had learning something about interactions in general:

> I learnt that sometimes you have to deal with people differently, like the librarian for example, even when the principal went over and talked to her she got sort of mad at the principal too; so that was kind of funny. We were, like, OK and there are many different types of people and you have to deal with them differently.

Because the termination of the project meant that my observation of the young women was limited to just one hour, I was unable to determine any behaviour changes which reflected learning. However, during this short time I was impressed by Delores's and Rosie's display of a high degree of confidence and competence, both in their workings with the class as a whole, and with Mrs. Smith individually. So, too, did they appear relatively undeterred by the previous confusion in the library. As such, they displayed an impressive level of maturity, and seemed to enjoy their interactions as they responded to the childrens' concerns and answers, and presented their own interpretations of the evolving situation. My notes, at the time, suggest I was struck by how

seriously motivated they were, and how honestly they portrayed themselves in a particularly demanding situation. Thus, although I cannot be certain, I would say that either the young women came into this situation with already highly developed skills in this area, or they quickly learned something due to the intense circumstance in which they found themselves. Since it was probably a combination of both, I conclude there is medium support for the improvement of the group-related skills of Rosie and Delores.

B. Problem-solving

Delores's testimony suggests she improved her problem-solving skills. Concerning her previously mentioned interaction with the class as a whole, Delores remarked that for many reasons she found the process of leading the group particularly challenging: "it was sort of an interesting challenge to have to go in there and make sure to bring everything down to a level that they could understand because I wanted to explain more about the web page." In other words, through the process of dealing with an authentic and immediate problem which she hand not encountered before, Delores learned new skills. Similarly, Delores recounted how she attempted to solve another unique problem, that of having control of the class while not appearing to be in control:

> I also sort of realized when I as talking with the kids I want control but I don't want to be that big person who needs to have control, sort of like you want to have the control without appearing to the kids that is all that matters. It was sort of a balancing act.

Once again, it seems safe to assume this attempt to solve this particular problem could have helped in the development of Delores's general problem-solving abilities.

In conclusion, the problems which Delores faced in the one hour with the class were novel, difficult, authentic, and immediate. That Delores solved them suggests she could only have learned something from the experience. At the same time, although Rosie made no particular comments which could be easily interpreted as indicating that she had developed her problem- solving abilities, my observations allow me to conclude she dealt with the same problems and was at least as successful as Delores. In other words, I would argue Rosie improved her problem-solving expertise in tandem with Delores. There is weak support for the development of the problem-solving skills of both Delores and Rosie.

C. Technology skills

Because their project was terminated before Delores and Rosie were able to begin working on their web page and using other facets of computing with which they were relatively unfamiliar, they did not have an opportunity to expand upon their already proficient computer skills.

D. Workplace responsibility

There were two situations which had a profound effect on Delores's learning, both in regard to workplace responsibility and other aspects of the project. The first (as will be further explained in the next section) was the confrontation in the library between the librarian, the principal, and Mrs. Smith about whether the two students should be allowed to use the library's Internet connection. The second was the abrupt realization that because Mrs. Smith knew very little about making and maintaining a web page, her expectations for the class were very unrealistic. Once they came to this realization about Mrs. Smith, said Delores, their first challenge was to explain to her the demands of a web page and attempt to temper her grandiose expectations (for a grade three class) of being able to update it daily. Thus, stated Delores, without jeopardizing the project as a whole, they attempted to be gentle in their response and did not come out and directly say, "no, that cannot be done." Their ultimate goal was simply to complete a basic web page which could then be added to in the future, if the situation permitted. Thus, they hoped Mrs. Smith would come to understand their limitations and be happy with the basics. Based upon both these event, Delores said she learned the following:

> It shows you that although what you learn in the classroom is important there is so much more than just the knowledge or whatever, you have to be able to get along with the people you are working with; you have to understand what the person you are working for wants.

Similarly, Rosie, in her final statement for Dr. Taunton wrote "*I learned that you have to be realistic about what you want.*" That is, both young women seem to be saying that perhaps the project would not have been terminated if they had gone into it with a more complete understanding of Mrs. Smith's expectations, and their abilities to meet them. As such, they might have taken the time before beginning with the class to temper Mrs. Smith's demands or revise their own

understandings of what they thought could be accomplished, and possibly have averted the library confrontation.

E. Project management skills

As Rosie and Delores quickly came to realize, one of the main reasons for the failing of this project was improper preparation. Besides the aforementioned misunderstanding regarding the difficulties of maintaining a web page, the library confrontation seemed to be caused by a lack of communication between the school principal, the school librarian, and Mrs. Smith. When Delores and Rosie arrived to begin downloading Netscape from the library's Internet-connected computer, they were given only 15 minutes to complete the task because another class had already been allotted the needed space. In other words, either Mrs. Smith had not reserved the time for the two young women (an oversight or lack of understanding) or her reservation had gone astray.

Significantly, as Delores and Rosie also soon realized, other important aspects of the planning process had also gone awry. For instance, the two students had previously been led to believe the grade three classroom would have its own Internet connection when the project commenced. For whatever reason, this was obviously not the case. Furthermore, Delores and Rosie later wondered why they had not brought a copy of Netscape with them rather than having to depend on downloading it in the library. Obviously there had been a lack of foresight in this regard.

Hence, the project began on shaky grounds and about a week after the first on-site session, Mrs. Smith phoned to tell Delores, Rosie, and Dr. Taunton that she was not prepared to continue. Both the students were disappointed but said they had learned a lot about the need for proper planning and preparation. Rosie, for instance, had two insightful remarks in this regard:

> I guess that I learned that you can't just go ahead and do something; you have to plan ahead and you have to make appointments and make sure that everything is set up properly before you do something.

> The schools which we are helping should be more prepared because when we went there they were still getting the Internet connection, they only had one connection in the library and that was it, so it was a little difficult for us to get on and do whatever we needed to do, and also we tried getting Netscape and . . . I guess that we should have been a little more prepared for the task.

Delores's comment regarding planning was similarly appropriate:

> I think before we actually jump in and start anything, I'd make sure I clear all the political paths and see if logistically, can we do this and plan everything out a little better. I'd say before we even get started, book the library for this time, make sure of this, you go and ask the principal to get everything organized, set up before I even set foot on the premises so that in that way if there are any problems I am not wasting your time and you are not wasting my time.

In conclusion, although there were no changes in behaviour which I observed in order to confirm the testimony of the two students regarding what they had learned, I think the insight and maturity which they expressed concerning their understanding of the project and its traumatic termination suggests their learning is both real and not something they will soon forget. There is medium support for both students for this learning outcome.

F. Personal development

Both young women made statements which can be interpreted as implying they had personally developed as a result of this experience. According to Delores's written submission to Dr. Taunton, she learned to *be ready to adapt and compromise*," while Rosie said, regarding working with the grade threes, "it taught me to be really patient with them." Beyond these two comments, however, I would surmise that based upon their experience as a whole the two young women may have matured in a number of other ways as well. There is weak support for Delores and Rosie in this area.

G. Service ethos

Rosie made one remark which might be interpreted as expressing a thought about the giving of service. That is, regarding working with the class of grade-threes, she said she learned she liked the fact that not only were her and Delores able to give the children the freedom to express their own ideas, but that the credit for these was appropriately given: "I really liked the fact that they got to express their ideas and give us information on how they wanted it to look, and I guess that it is good because it gives them credit for it instead of us." In other words, she realized she liked being able to give something to the students. There is weak support for Rosie in this area.

H. Community of practice knowledge

Delores had interesting thoughts about the school as a whole. Whether all her statements correctly reflect this community of practice I cannot say. However, the statements indicate that she felt she learnt some important lessons. Regarding the political aspects of an elementary school, Delores expressed the following:

> I sort of learned more about the political working of an elementary school and just about how I thought it was going to be a lot easier just from the standpoint of well, I thought the biggest complication would be doing the programming and building the web page when really the hardest challenge was to get through all the politics of the school. . . which really surprised me because she had disillusioned me about elementary school librarians being nice, she was rather upset at the principal. I though if there was anyone she should be nice to, it should be the principal, but no.

Based upon my twenty years in a number of schools and school systems, it appears Delores's thoughts about the school system, in general, are not entirely unfounded. Also based upon her clarity of expression and insight, and the proposition that she could not come to this conclusion without having learned it, I suggest there is medium support for this learning outcome for Delores.

Rosie, on the other hand, had something to say regarding what she thought she learned about the classroom and the students: [I learned] "they came up with really good ideas and I liked their drawings and how they sketched it; that showed they had put time and thought into thinking what they wanted on their web page." In other words, Rosie came to an awareness of the capabilities of young persons, perhaps something about which not many people become aware until given the opportunity to interact in a certain manner. I think the aforementioned argument which I made suggesting there is medium support for Delores's learning applies to Rosie as well.

Conclusions

Like Delores and Rosie, I experienced a number of unintended learning outcomes as a result of this project. For, even though I knew of the importance of planning, this project allowed me to experience the results of its lack. Similarly, the failure of this project reinforced my awareness of the need for proper "job" placements, and for the need of capable and understanding clients who will not only prove appropriate models, but will provide expertise when required. Also, I came to a greater realization of how fortunate I was that most of my research agenda had

proceeded according to plan, and any time when one has to deal with a number of different persons and entities, the potential for misunderstandings can never be totally eliminated

Transposing this experience to the community service learning project in general, then, I came to a greater realization that outside-classroom learning has greater potential to be unintended and unmanageable than in-class learning. In other words, as the teacher relinquishes control it becomes a priority that the structures which are erected to take his/her place are satisfactory. In this project, because this was not the case, the results could have been extremely upsetting for the two students. Fortunately, Rosie's and Delores's demeanour and interview responses suggest that although they were disappointed by the cancellation of the project, they were not as traumatized as might have been other less confident and mature persons. Nonetheless, I feel this is an experience they will not soon forget, and some of the lessons which they learned, somewhat akin to being taught to swim by being thrown in a pool, will have a lasting effect. However, as both these students showed so much potential is such a short period of time, it is very untimely they did not have the opportunity to realize greater development though involvement in a complete project.

6. The Western School Internet Web Page Project

Overview

Project group members

Johnny (m), Lawrence (m), Samuel (m), and Janis (f)

Project client

Western School

Project description

To design a school Internet Web Page

Project location

No specific site

Project logistics

The students worked on the project during their own time at places of their choosing.

Site description

This project took place in the school library, in different areas around Western School, and in the homes of the project group members. These students, generally, worked independently of anyone except other group members.

Project Duration

Approximately four months over which the students worked approximately 14 hours each (according to their determinations).

Client contact person

None.

Other involved client representatives

None.

Process of project initiation

The students initiated this project on their own. Neither Dr. Taunton nor I had any knowledge of what they were doing until I asked.

Researcher's participant role

I met with members of this group for approximately 15 minutes over a couple of months. During these times, I tried to give encouragement and some direction regarding planning and report keeping.

Researcher's research role

I interviewed Johnny, Lawrence, and Samuel; Marcia was not interviewed because we could never coordinate a time. The interviews were taped and later transcribed verbatim.

Total research time

a) Informal conversations, approximately 15 minutes, b) personal interviews, with Samuel, 15 minutes, and with Lawrence and Johnny, 10 minutes each. Total time, approximately 50 minutes.

Outcomes of Learning

A. Group skills

This group worked independently of outside influences. They chose to not consult teachers, clients, or friends but worked together and looked "endlessly in the library for information" (Lawrence). All the group members, in one way or another commented on how much they enjoyed working together and how glad they were they had a chance to work with friends and learn from their partners. Feedback from each other, and ongoing results dictated the ongoing direction of the project. In many ways this project resembled a situation in which a project group prepares a proposal for a perspective client. However the proposal, in this case, lacked client-imposed expectations.

A common concern of all group members was "the need of a strong leaders" (Samuel). As a result, they tended to not follow deadlines and felt they wasted a lot of time and only were able to come together "after the thousands and thousands of hours of rescheduling" (Lawrence). Significantly, however, all group members did state they enjoyed working together and through the experience they came to greater realization of the importance of teamwork and compromise. For example, Johnny said that as a result of all the disagreements and wasted time he came to understand that in order for a group to be productive, the members "need to compromise." He also stated that only with his group members, but "not by myself," would he be able to make a web page. Meanwhile, Lawrence had some thoughts on how to choose one's group:

> If you work better together the work done is going to be of a better quality, so that's why I think when teachers pick our groups for us it doesn't work as well because if we are not friends we do not work as well with each other because there are problems, right. We kind of had an idea, [about this] that's why we chose all our friends and it proved out. Just choose your group, that is the key thing.

And Samuel added he learned "basically group task work, how to be effective as a group to get a project done."

Thus, unlike most of the other projects, these students, as a group, were responsible for all aspects of goal setting, organization, formative assessment and a variety of aspects of project management. As a result, they probably were not as efficient as the other groups but, on the other

hand, did benefit from the experience of having to work together to make important decisions which otherwise would not have been made. There is weak support for each of student's development in this area.

B. Problem-solving

My conversations with all the students in this group led me to believe that they constantly had to cope with a number of problems without adult help. However, only Lawrence made a comment which I could directly interpret as being indicative that any one of the group had improved his problem-solving abilities. When I asked him how they learnt to make a web page Lawrence said "at first we didn't really know how to write a web page so we have to go look for information." This I took to indicate he had improved his problem-solving skills by realizing he had to do research to find the proper resources, and then learning how to so. Thus, there is weak support for Lawrence in this area of development.

C. Technology skills

Because this project was entirely devoted to developing a web page, something none of the group members had done before, all of the students strongly indicated they had improved in this area. In this regard Johnny said "because it's the first time doing an actual web page it's really hard to make one; it's really complicated," and he learned "just a little bit about web pages, how it works and the language." Lawrence remarked "we learnt that Macintosh computers and different computers that weren't working together," and Samuel stated "I am better at making a web page than I was before." There is weak support for all three students in this area.

D. Workplace responsibility

Because this group was working in a vacuum, I am not surprised that there was little said that related to life in the real world or the difficulties of meeting the needs of a demanding client. However, concerning the difference between this project and the more traditional school activities, Samuel did say "it's like owning your own business; you do what you want and you set up your own deadline." He also added "it's more relaxed, you are not really concerned, you are not pressed on time and you could do whatever you wanted on it." Although these statements

probably are not entirely correct in their representation of the demands of owning one's business, they do seem to have some general truth to them. There is weak support for Samuel.

E. Project management skills

The most highly represented learning outcome regarded the need for planning. All of the students either directly stated or implied that because of poor planning and organization they were not as efficient as should have been. When I asked what they had learned that they would pass on to others who were going to go through a process similar, their responses included "research the topic before [you] make the decision" (Lawrence), and "have everything done on paper first; plan it out" (Samuel). Meanwhile, Johnny had slightly more to say in this regard:

> Make sure they have a really good plan of what actually they are going to do first before they actually do it; its really helpful to have a plan; . . . it takes a long time to plan this project and its hard to plan it to make it right; . . . you have to be very organized; . . . don't procrastinate.

These comments indicate, to some extent, these group members experienced the same "trial by fire" as did Rosie and Delores. Although it was probably not as traumatic, they did have to learn quickly and immediately without help from their teacher. Obviously a classroom component which taught these skills before the group began would have been beneficial. There is weak support for all three students.

F. Personal development

There were no comments relevant to this learning outcome.

G. Service ethos

There were no comments relevant to this learning outcome.

H. Community of practice knowledge

There were no comments relevant to this learning outcome.

Conclusions

All the group members indicated they thought this was a successful project and they had learnt a lot which they would not otherwise have learned. However, because the group did not have a definitive client, this project might be argued to lack certain realities of an authentic working

experience. However, in many ways, it can also be argued this project parallels a situation in which a work-group prepares a job proposal for consideration by a particular client, with, in this case, the client being the school at which they were enrolled.

Although there was considerable testimony from all the students that they had learned a considerable amount about group work, designing a web page, and the need for planning, because the group was never observed by me, a client, or Dr. Taunton it was never possible to obtain any collaborating support. The statements which the students made, however, certainly are indicative learning occurred.

Comparisons with the other projects suggest that students who worked with specific clients had a greater range of learning outcomes. Certainly the absence of the development of an ethos of service, a lack of development of knowledge of a particular community of practice, and a lack of increased awareness of real world work demands should not be unexpected from a situations in which there is no contact with a particular client and/or external environment. At the same time, the lack of personal development might be attributed to the fact there was no objective client to offer positive feedback. On the other hand, the emphasis on the development of planning-related expertise is something from which all of the other project could benefit.

7. Information Technology Department Web Page Project

This project was almost identical to the preceding one. In this regard, three students worked without a client and without discussion with any adults to produce an Internet web page for the school's Information Technology Department. Learning outcomes also corresponded with those of the preceding project. As such, students emphasized their development in group work, problem-solving, technology skills, and project management.

There was one significant difference between these two projects, however. Because this project began as a failed attempt to make a homepage for the Mandarin department the students had the chance to apply the skills which they had first developed, to the technology web page.[13] In this

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13. This project failed because the students were never able to determine a means of efficiently entering Mandarin characters onto their web page..

regard, all of the students mentioned or implied that the opportunity to practice what they had first learned resulted in a greater realization of their learning. Thus, it might be argued such an opportunity would be useful in any learning experience.

8. Computer Trouble-Shooting Tasks Project

Two male students performed various computer trouble-shooting tasks for various teachers around the school. Generally, this series of tasks can be classified as a number of small jobs rather than one self-sustaining project. Because I never knew about this "project" until I received the written self-assessments/projects descriptions which Dr. Taunton had assigned, it plays no part in this investigation except for one cursory note. That is, of all the students in the class, only the two involved in this project expressed (in their written statement) a certain degree of unhappiness. For, rather than being able to identify, for example, collaborative or planning skills which they might have developed, they only pointed to their lack of satisfaction due to having to work on very old computers. In other words, as their only focus was upon their specific computer-related independent tasks, which in their experience were somewhat limited due to the age of the computers, they were not able to turn to the other important aspects of community service learning for a different type of satisfaction. There were no positive learning outcomes reported by the students involved in this project.

Summary Of Results

The nature of student learning ensuing from the community service projects conforms to expectations. That is, the eight different thematic categories of learning which emerged during the course of this investigation are generally resonant with the learning inherent within and across the four situated contexts. This is illustrated as follows. First, the learning outcomes entitled "technology skills," and "community of practice knowledge" correspond to the learning inherent in a situated context with its main focus upon learner immersion within a community of practice. As such, inherent learning outcomes include increased knowledge of the community, including the artifacts and resources within its employ. Second, the learning outcomes entitled "problem-solving," and "increased awareness of real world demands," are what can be expected in a

authentic context. For, in such an environment learning results from the motivation of learners to solve real world problems. Third, the learning outcome entitled "the development of group skills" correlates with the collaborative context and its emphasis upon small group interactions, peer guidance, and community expert guidance.

The final learning outcomes regarding "project management," the development of a "service ethos," and "personal development" all find resonance with the theoretical/reflective context's emphasis on the integration of the theoretical and practical. Project management, for instance, is directly related to goal setting and situated cognition. Meanwhile, the development of a service ethos and personal development can more closely be seen to be an outgrowth of reflection, that aspect of situated learning which attempts to make sense of the learning experience through personal and/or guided analysis and assessment of the learning experience as a whole.

At the same time, the finding that there were only 9 instances of students developing their ethos of service might be thought to be problematic regarding expectations concerning the integration of community service learning and situated learning. It might be argued that only 9 of 17 students developing their service aesthetic is not a particularly significant indication that community service learning/situated learning amalgam is an effective means of achieving this goal. However, if one considers that of the 8 students who did not develop in this area 6 were involved in the projects in which the idea of service was just an abstract concept, then we find that 9 of 11 students in a service environment developed in this area. Furthermore, though this is only conjecture, it might be suggested, to some extent, the personal development experienced by 10 students was a function of service-giving. Though confidence and patience certainly can result from any kind of job experience, growth in these areas can also be related to the satisfaction ensuing from a service experience.

The summation of all student learning outcomes suggests the situated learning/community service learning amalgam produced a wide variety and depth of development (table 5). Besides the 14 students who improving upon those specific skills most closely associated with this kind of course (computer skills), all the students also developed a in number of ways which are not

necessarily associated with a computer classroom. Most significantly, at the top of the list we see that all of the students showed development in group work skills, while 14 made problem-solving gains; 12 improved their understanding of the demands of the real world; 10 matured in the area of planning and organization; 10 displayed evidence of personal development; 9 developed their service aesthetic, and 7 gained knowledge of their community of practice.[14] Thus, although there could possibly be some debate about some of the individual learning outcomes of some of the students, overall these projects were characterized by significant student learning.

In keeping with the design of this investigation, many of these findings are given additional credibility through medium and strong support. In this regard, those learning outcomes which received the greatest degree of overall support also tended to receive considerable strong and medium support, with this support spread relatively evenly over the whole spectrum of learning outcomes. Specifically, though, workplace responsibility, personal development and the development of group work skills received more strong and medium support than any of the other learning outcomes. I surmise that problem-solving, one of the more highly represented learning outcomes, overall, did not make this list because its distinguishing attributes are less visible and, thus, more difficult for observers to identify. Meanwhile, the development of a service ethos was the only learning outcome to not garner any triangulated support. Perhaps, this is not surprising due both to its general outward invisibility (like problem-solving), and to its lower overall representation.

Although it is difficult to compare different projects regarding their total collaborated support for learning, the one which did receive the greatest degree of such support was the school room project. This may be due to the fact this project had the greatest numbers of clients available to observe and comment upon changes in student behaviour. But, I also think the very rich learning environment which the students were fortunate to enjoy was instrumental in this regard. At the same time, only the two unobserved projects failed to demonstrate any strong or medium support

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14. It must be remembered that one project was terminated after one hour, and that two were lacking interactions with a client. As a result, it is possible to suggest that those aspects of learning which were interrupted by these situations might have shown greater representation.

for any of its associated learning outcomes. Thus, although each learning outcome for each of the students did not receive collaborated support across all of the projects, it can be seen this type of support was common throughout all the projects.

Table 5: Number of Students Associated with Learning Outcome

LEARNING OUTCOMES	No. of Students (17 in total)
A. Group skills	17
B. Problem-solving	14
C. Technology skills	14
D. Workplace responsibility	12
E. Project management skills	10
F. Personal development	10
G. Service ethos	9
H. Community of practice knowledge	7

CHAPTER 6: DISCUSSION AND CONCLUSIONS

Introduction

This final chapter has three sets of foci. The first provides a theoretical analysis of situated leaning and community service learning as interpreted through this study. In this regard I discuss issues regarding the relationship between theory and practice, the critiques of situated learning, the role of technology, gender bias, and the ITM curriculum. The second part of the chapter concerns itself with the viability and implications of implementing the community service learning/information technology program in high schools. The final section offers some concluding comments on this study through reference to possible reservations regarding the learning which occurred, and consideration of potential directions for future research.

Theoretical Considerations

The Situated Learning/Community Service Learning Relationship

Situated learning theory posits learning is a function of socio-cultural context, particularly emphasizing the learner's authentic involvement in communities of practice. As such, learning is seen to be 1) directed toward the solving of authentic projects, 2) mediated by cultural artifacts, and 3) dependent upon cooperative interactions in which the more skilled lead the less skilled through their zones of proximal development to higher levels of understanding. It also argues that, in some way, 4) theory must be integrated with practice. A learning situation which meets all of these criteria can be said to be an example of situated learning.

Most of the projects which I investigated exhibit the characteristics of situated learning. There can be little debate the first three of these conditions were met in the five projects in which students worked directly with clients. For instance, 1) student learning was directed toward the solving of authentic computer-related problems, 2) learning was mediated by the language, the computers, and the general practices of the hospital, community club, or school room in which the students worked, and 3) the learners gained greater levels of understanding with help from more able peers and/or the teachers and other clients with whom they worked.

Whether the fourth condition, the theoretical aspect, was met is slightly more problematic. Because there was no classroom component dedicated to the projects it might be argued there was no opportunity for the students to be helped to relate the scientific to the everyday (as explained by Vygotsky), nor was there the chance for their teacher to practice cognitive apprenticeship though modelling and/or scaffolding. On the other hand, however, it is likely the normal activities of the computer technology class in which the students were enrolled served as 4) the general theoretical component for the technology facets of their projects, while aspects of their schooling, in general, offered the means by which they were able to internalize enough theory needed to practice their other tasks. While the students' scientific knowledge did not necessarily meet the expectations needed to fulfil all the practical requirements of their projects, it did suffice to allow them to perform a manageably. Thus, it can be argued the learning which did occur can be attributed to situated learning.

The findings also demonstrate that the projects were examples of community service learning; although, the absence of a formalized reflective component might suggest this was not the case. However, as not all definitions of community service learning include a reflective component, and because my discussions and interviews with the students and their final self-assessment for Dr. Taunton did assume a somewhat reflective role, I think this absence is problematic but not necessarily critical. Thereupon, I would argue that because the students applied their academic expertise in the performance of community service, these were service learning projects in which the reflective elements were under represented but not entirely lacking.

In turn, as conceptualized by the framework, the correspondence between situated learning and service learning is born out in that the pertinent attributes of community service learning are seen to correspond to those of situated learning (table 1). Although I have not gone into explicit detail about all aspects of each of the four contexts, the description of the findings is rich enough to allow the specific student community service learning activities to be appropriately categorized as per each of the situated learning contexts. Thus, for example, we see that some students worked with each other and their clients (collaborative context) in order to use their theoretical technological

skills (theoretical/reflective context) to perform services like the solving of computer problems (authentic context) in and for a hospital (situated context).

Furthermore, the resulting nature of student learning finds resonance with that indicated by my situated learning framework. Thus, students tended to 1) gain knowledge about different aspects of the context in which they worked, and develop a greater understanding of the 2) processes of group interactions, 3) problem-solving, and 4) project management as delineated by the 1) situated, 2) collaborative, 3) authentic, and 4) theoretical/reflective contexts, respectively. In other words, although it was not always possible to categorize each characteristic of learning as ensuing from engagement with a specific context, the nature of student learning in the projects is consistent with that of situated learning. And conversely, in those cases in which a particular context was under represented, the nature of overall student learning was effected adversely.

Moreover, it appears each of the general natures of learning was further determinant of coinciding specific learning outcomes, as theorized   That is, in those situations in which the nature of learning was collaborative, the resultant specific learning outcomes were related to collaboration. For example, the students in the hospital developed their group work skills (collaborative context), but because they had no opportunity to plan (theoretical/reflective context), growth in the area of project management was lacking. Thereupon, besides developing a number of technology skills, the students also developed in the following areas: group skills, problem-solving, workplace responsibility, project management, personal development, and community of practice knowledge. Additionally, in keeping with the findings of other investigations regarding the effects of community service learning, some learning outcomes also include those directly related to the giving of service, what I refer to as the development of a service ethos.

In conclusion, in this Computer Technology classroom, the integration of community service learning and situated learning resulted in a symbiotic relationship in which the nature and specific outcomes of learning were 1) accounted for by situated learning and 2) enhanced beyond what is expected of the typical Information Technology course in British Columbia (Ministry of Education, 1997). Thereupon, it can be argued that through its well documented and rigorously

determined empirical findings, this investigation appears to: 1) offer situated learning as a theoretical framework for community service learning, 2) add empirical support to the learning claims of both situated learning and service learning, and 3) suggest a means of enabling education to become more responsive to the students and community.

<center>The Critiques of Situated Learning</center>

As discussed in the literature review, situated learning is subject to a number of criticisms. Although my investigation was not intended to specifically respond to these, the findings do speak to the critiques in various ways. As such, I begin with a look at the most contentious issue, the transfer of learning to multiple domains, and then move to other relevant matters which emerged.

The main critique of the transfer of situated learning is that learning is so context-specific and concrete it cannot facilitate the more creative and abstract pattern recognition needed to make symbolic representations across situations. The results of this investigation, however, appear to demand further consideration of this proposition. That is, the emergent categories of learning outcomes, in themselves, are suggestive of abstraction and application beyond the environment in which they emerged. Neither are group work skills, nor problem-solving skills, nor workplace responsibility, nor project planning skills limited to a specific time or domain. Thereupon, as in any classroom in which similar student learning outcomes tend to be generally accepted as transferable to domains outside of school, there is no reason to suggest this should not also be the case in these situations. The finding, for example, that all 17 of the students improved their group work abilities can be seen as a point of departure for discussion regarding Bereiter's (1997) comment that situated learning is not sufficiently transferable to get "people to the moon and back" (p. 287), a cooperative endeavour of the greatest magnitude.

The findings of this project also respond to other criticisms of situated learning. Most obvious is the contradiction of the argument that situated learning does not result in significant learning (Tripp, 1993; Winn, 1994). In this regard, I think that as the findings speak for themselves, there is no need for further elaboration. On the other hand, Winn's fear that situated learning promotes teacher irresponsibility through its emphasis on facilitation rather than

"teaching" might find some credibility in Dr. Taunton's lack of involvement. However, the fact Dr. Taunton was lecturing to his classes instead of working with the project groups tends to suggest, instead of irresponsibility, a lack of organization attributed to the newness of the program. Nevertheless, this lack of involvement, manifest particularly in the missing classroom component, does certainly suggest possible teacher irresponsibility cannot be totally ruled out.

Similarly, Hay's (1993) argument that communities of practice are not educationally worthy, for a variety of reasons, could possibly find some support in the unfortunate discontinuation of the elementary school project. However, the specific factors leading to this termination, and the fact that the client was an elementary school seem to say it was for reasons other than educational unworthiness that this project did not succeed. On the other hand, Hay's general contention that situated learning sites must be carefully considered seems not only to be sensible, but is given merit by the failure of the elementary school project to come to completion. Finally, I think, Damarin (1994) might be happy with the finding that a number of the students realized they liked teaching and helping. This development finds resonance with her hope that learners, as a result of their situated experience, will come to value other forms of knowledge.

The Role of Technology

Technology, plays an important role this investigation. For, as the focus of student expertise, it provides the rationale by which students were integrated into the community, and, consequently, enables the conclusion that community service learning is a potentially productive means of utilizing educational technology. These results are in keeping with other studies of the effects of the integration of technology and education which have found that when technology is implemented in a progressive manner, the ensuing educational outcomes are similarly progressive. In other words, if for no other reason, this investigation is justified through its contribution to the debate regarding the purposes and means of implementing educational technology.

This is not to say, however, students could not have shared any number of other areas of proficiency with the non-profit agencies with which they were involved, such as skills related to the fields of music or literature. For example, students in an English class may have taught creative

writing to seniors or worked with a community centre to produce a newsletter. Although, if this were the case, those learning outcomes associated directly with the development of technology skills in this investigation would concern English instead. Thus, an inquiry into the integration of community service learning, situated learning, and English skills might reach similar conclusions regarding the relationship between situated learning, community service learning and technology. However, instead of indicating a positive method of teaching technology, it could identify a productive means of teaching English.

Nonetheless, today's interest in computers and the related demand on technological expertise coupled with the seeming inability of a number of non-profit agencies to afford the resultant market driven costs provides an excellent opportunity for the integration of school and community. As such, not only can the real needs of community agencies be met but at the same time young persons are provided a unique chance to become involved in a high profile vocational activity in which they can improve their skills and, at the same time, be seen as experts. And, thus, the students are in a position to not only improve their chances of employment in their area of interest, but at the same time benefit from the accompanying authority and responsibility which they are afforded, something not generally the case in school-related activities. To various degrees, this was the experience of those students in these projects in which computer trouble- shooting was a main priority of the clients.

Of course, students should be awarded in the same way for providing non-technological expertise such as that required to teach literacy or singing. However, as computer skills are presently highly prized, relatively rare, and equated with growing societal productivity and improvement, they represent a special opportunity for the integration of the young into society. Whether this emphasis on technology is mistaken and/or detrimental to other aspects of society (such as literacy as music) is a significant question whose answer is, unfortunately, outside the purview of this investigation. In this light, however, I suggest that a variety of community service learning projects from across the spectrum of the school curriculum be implemented and investigated. As research suggests, whether they are from the scientific or humanistic domains,

student learning and community benefits will be significant. In other words, educational technology holds no monopoly on community service learning as an instructional methodology, and the results I draw concerning the implementation of community service learning for the teaching of technology might apply to other subject areas just as well.

Additionally, this investigation has no substantiated comment to make upon the possibility of a special situated learning/technology relationship. Although most of the skills which the students applied were technological in nature, there is nothing to suggest these specific abilities had any unique role to play in the facilitation of the situated learning which occurred. However, it is possible that if ITM's on-line component, Studio A, had been utilized then communications between all stakeholders could have been improved, and electronic mentors availed upon. Thus, it might have been the case that projects were expedited in such a manner so that the liabilities associated with distance-related logistics were overcome. In other words, technology may have been able to de-problematize certain aspects of the situated learning environment in which these students worked.

Gender Issues

Although this investigation did not provide any answers about ways technology exacerbates gender-specific educational discrepancies, it did raise some questions about the cause of such inequalities, particularly as manifest, herein. The most obvious of these questions asks why there were so many more boys than girls in the Computer Technology 12 class. The answer to this is integrally related to a more general solution to the problem manifest in the recent findings that in British Columbia secondary schools female enrollment in technology and computer courses has dropped related to male enrollment over the years, 1994/95 to 1996/97 (Bryson & De Castell, 1999).

Another very intriguing finding concerning gender disparities in this project regards the realization that although learning seems to be equally productive for the males and females, each of the four young women who took part was involved in some kind of an anomaly. For instance, the one project which did not come to a successful completion was the only one in which the project

students were solely young women. Furthermore, the only student who had no project group members was a young woman, and of all the students who fully participated in these projects, the only one who I did not manage to interview was a young woman. Unfortunately, this investigation provides no insights into the causes of this situation.

On the other hand, it is possible Walkerdines's (1997) previously mentioned semiotic interpretation of situated learning might provide some clues. That is, Walkerdine would argue the answer is to be found in the Foucaultian perception of a societal power grid and the resultant ability of particular discourses to produce various signifiers and signifieds. In other words, she would assert my investigation was focused upon the wrong questions. Rather than asking what students learned in each of these projects, if I had investigated how "subjects were produced differently in different practices" (p. 65), this inquiry might have been able to determine how it was that the discourses in which these young women (subjects) were immersed had produced these gender-oriented anomalies. In this regard, future work might investigate, for example, the productive processes and various outcomes associated with each of the situated contexts. As such, not only would such an enquiry resonate with Walkerdine's perspective, but at the same time, it would more generally respond to the recent interest in the relationship between context and the individual learner.

The Information Technology Management Curriculum

The philosophy and intent of Knowledge Architecture's Information Technology Management Curriculum ably served to give general direction to the projects. However, the lack of the necessary classroom component ensured that students were given neither consistent leadership nor ongoing feedback regarding many aspects of their projects, with group processes, project management, and reflection highly visible in this regard. As a result, student development was probably less than might have been expected.

The lack of a reflective component is also particularly problematic concerning what I feel to be one of the most important reasons for the implementation of community service learning. That is, as previously discussed, a good service learning program would do well to present learners the

opportunity to come to a better understanding of the need, process, and telos of service. In other words, it must extend the possibility of engagement in a specific societal critique. One of the requirements for such a endeavour is that students be able to reflect upon and discuss their service experiences. The chances are that without such a reflective process, unless the learners are particularly unique in a number of ways, little critical thought will occur and the status quo will be unattended. Except for the two young women involved in the project which was summarily terminated, I am not aware of any other societal critique offered by the students in these projects.

My findings also have implications for means of incorporating appropriate assessment into the ITM curriculum, in particular, and community service learning in general. For example, that problem-solving strategies and group processes were among those skills most highly prized suggests a dynamic evaluation procedure such as the video taping of group interactions might be emphasized. At the same time, the results concerning the growth of self confidence argue for some means of self-evaluation. Most importantly, though, the lack of learning which can be argued to be attributable to the absence of the theoretical/reflective component in the projects seems to demand that in each step of community service learning, assessment and learning be integrally related so as to be able to allow for formative reflection. As previously discussed, the ability to utilize Studio A may have been able to aid with various means of record keeping, communication, and assessment.

Theory into Practice

Justification for Community Service Learning

The outcomes of this investigation indicate that community service learning, as a viable means of utilizing educational technology, warrants serious attention within high schools. For, as a consequence of their projects, all of the students enhanced their learning in a number of areas, as per the general nature of learning expected. Most germanely, almost all of the students improved their technology skills, with many specifically commenting that their learning resulted directly from involvement in the project. Moreover, some students also remarked that the project allowed them to improve their learning through the application of theoretical understandings in a practical

environment. Furthermore, Dr. Taunton commented he thought the program was successful and pertinent, and he would certainly like to implement it again in the next school year.

However, considering that an improvement in technology skills is expected from a computer course, a more important justification for continuation of the program comes from the findings that student learning expanded in a number of areas beyond what would be expected from a traditional Information Technology class in British Columbia. Most significant of these, I think, is that regarding group learning. For, although my twenty years of teaching high school can attest that group work is a large part of many teachers' instructional repertoire in a number of different types of classes (I have used a variety of forms of grouping regularly over my teaching career), never before have I been so aware of the merits of the group enterprise, particularly regarding the enhancement of student learning.

I am sensitive to the possible criticism that these teaching-related group work observations, in themselves, provide a weak type of supporting evidence. Thus, I refer to work of David Johnson (1981) on student cooperative learning to support my case. For, though Johnson found that when students work in groups, achievement, cognitive and affective perspectives, and student-student relationships all improve, he also concluded such development was dependent upon "the way in which teachers structure learning goals and the way in which teachers manage and encourage controversies" (p. 9). In this regard, it can be argued that because neither this structuring nor managing occurred in the projects (due to the lack of a classroom component), something else must have been happening to make the groups so successful. Furthermore, nowhere in Johnson's work are there findings that students heightened their awareness about the potential of working in groups or they improved their group work skills, two observations made by students involved in the service learning projects.[15]

As such, there are two reasons, I surmise, why the development of group work skills was so significant in these projects. These are both directly attributable to the special characteristics of

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15. It might be noted that in my classroom experiences with groups I have not followed the dictates of Johnson regarding the need for his particular forms of teacher management. Thus, it can be explained why the outcomes have not been what could have been expected in Johnson's definition of "cooperative learning."

community service learning, and that what differentiates it from traditional in-school instructional techniques. The first is that because the group work involved authentic activities with consequential results, students were particularly motivated to succeed. Thus, with their groups as the medium, they tried harder and learned more than might otherwise have been the case. The second reason regards the students' opportunity to work with adults. Not only was the authenticity of the experience reinforced, but groupings were strengthened and expanded through the inclusion of adults in the field. When the students were able to step outside the boundaries of their classroom, their individual and group skills were facilitated through the greater number of human resources at their disposal. In other words, not only did the students become aware of new and different abilities and life perspectives manifest in the adults with whom they came into contact, but they also had the chance to expand their own skills and develop new attitudes by observing and interacting with these adults as they went about their daily work lives.

The most obvious examples were the two hospital projects in which the expertise of staff was instrumental in guiding the three students in their interactions with the patients. As a result, student learning was expanded well beyond the technological domains into humanistic areas. Similar results may have been obtained by Clarise's behaviour of trusting the boys to work as an unattended group in the Club. As she stated in our interview, "the amount of benefit that a young person gets from being trusted like that is much greater than the loss that I would have if they were to walk away with one of my cheesy computers." In other words, Clarise modelled the positive effects of trust, one of the attributes required in order that group dynamics be successful. To summarize, student learning about groups was facilitated both by working with adults, and by observing adult attitudes about work.

All the remaining learning outcomes can also be attributed to the non-traditional character of the community service learning projects. Without community involvement, for example, students would not have had the opportunity to develop their service ethos, nor would not have learned about workplace responsibility, nor their community of practice. In the same way, many of the students also directly attributed their personal development to their success at a particular set of authentic

tasks and/or interactions which were new to them, sometimes mentioning in this regard their role as "expert in the field" and the associated assumption of responsibility. Likewise, the development of problem-solving skills might be ascribed to confrontation with real world authentic problems whose solution led to authentic results which the students could personally experience.

Further justification for the implementation of community service learning can be found by comparing some of the projects to each other. For instance, "project" number eight in which two students were assigned to various small tasks around the school (as opposed to the self-directed, long term nature of the other ventures) was the only one of all the projects in which the students did not make positive comments about their experience, the only project in which students reported zero learning. In other words, the "project" which was the least like a real community service experience and the most like a traditional school activity, was the least successful regarding learning (as reported on their written self-assessment for Dr. Taunton).

From a situated learning perspective the results of this school-based project might be attributed to their situation in which 1) instead of being involved with an ongoing long-term project in which they felt some ownership, they were assigned to a number of brief tasks by Dr. Taunton, and 2) rather than being a permanent part of a group, they had a number of partners with whom they worked at different times. Thus, rather than experiencing a variety of the situated contexts with their accompanying potential learning outcomes, the students simply saw their projects as the performance of "simple, basic, and tedious tasks" (Harry) which should be made "less repetitive" (Sang). In other words, rather than having the opportunity to work in a different environment in which they could interact, learn, teach, and explore, the two students seemed to see their project(s) more as a series of decontextualized activities with little challenge, more like more traditional in-school learning, perhaps.

Moreover, both of these students suggested that because the computers on which they were working were old, their learning experiences were less authentic than they would otherwise have been. Significantly, although I was aware students in the other projects thought the computers on which they were working were comparably outdated, I heard no mention of how they thought this

negated their overall learning experience. Perhaps, in the other projects, authenticity was never questioned because the students were able to see that the computers were an integral part of their community of practice. That is, the students involved in the authentic community service learning experience learned, maybe without realizing it, that the newest technology is not always affordable and certain segments of society must somehow "make do."

Support for the argument that the projects most resembling traditional schooling were the least productive is further strengthened by examination of the two projects which operated without a specific client. For, although there was meaningful learning reported by the students involved, total learning outcomes encompassed neither the breadth nor depth of those found in the five other projects which more exactly conformed to the dictates of the community service learning/situated learning model. Particularly, neither of these projects displayed any learning related to the development of a service ethos, community of practice knowledge, or personal development, and the learning associated with real world responsibility was minimal. Accordingly, I think it cannot be attributed to coincidence that the three projects which were least characterized by community service learning (and conversely, most similar to the learning activities experienced in the more traditional classrooms), were those in which the least learning was found by the methods employed by this study.

At this point I must reply to the possible criticism that as the learning outcomes determined by this study are outside the realm of traditional academic expectations there is little, if any, justification for the time and effort expended for their accomplishment. My response is related to that perspective of education in which learning is seen as being both a traditional academic endeavour and integrally related to the skills needed to succeed in everyday life. In this regard, the Province of British Columbia (1993) asserts that two of the goals of schooling should be to help students participate productively in independent and cooperative work situations, and have them demonstrate the skills needed to meet the challenges of a changing world. Similarly, another Province of British Columbia (1994) document emphasizes the need for schools to aim at developing (among other things) personal responsibility in students. Correspondingly, the Schools

Program Branch of the Ministry of Education of the Province of British Columbia (1992) has

mandated:

> [Students must] be willing and able to develop personal career/life plans while building
> skills for independent living and responsible decision making [and must] learn how to
> access and sort emerging career information through educational opportunities offered
> beyond the realm of the school that allow them to explore the types of work likely to be
> available to them. (p. 8)

Certainly the specific skills needed to meet all these requirements find resonance with the learning

outcomes of community service learning as determined by this investigation.

A second and related justification for the pursuit of the learning goals of community service

learning ensues from a study on employability. Specifically, the Conference Board of Canada, in

conjunction with a variety of business people and educators across the country, reported that the

three things which employers most highly value in prospective employees are academic ability,

personal management (positive attitudes, good behaviour, responsibility and adaptability), and

teamwork skills (Leroux & Lafleur, 1995). Of course, not everyone will agree with all of these

values, nor with the idea of business playing a role in the determination of educational goals but,

nevertheless, as employability is a concern for a significant percentage of the population,

community service learning does seem to present a means of meeting of this goal.

Implementation of Community Service Learning

Accepting, then, the outcomes of situated learning are both consistent with its goals and

educationally desirable, the question becomes one of how to obtain the most beneficial results in

regard to the extent and depth of student learning. The answer, as determined through these

particular community service learning projects is twofold. The first concerns the need to allow the

learners to experience a variety of different learning environments, and the other, the necessity of

combining a classroom component with the on-site experience. These will be considered in turn.

First, as has been observed, the greater the variety and extent of the situated learning

contexts which the learners were able to experience, the greater was the extent of learning. Thus, for

example, because the hospital projects allowed the students a greater access to wider number of

resources, learning about a variety of aspects of those resources (or as a result of interaction with

these resources) increased proportionately. Conversely, because the web page project was limited by its absence of a client and real world environment, learning was accordingly restricted. In other words, when students have to plan, organize and manage their projects they learn about planning, organizing, and management. Similarly, when students become involved in an environment in which service plays a primary role they learn more about giving service than those who do not experience such an environment. Consequently, certain learning outcomes can be given priority through emphasis on the related contexts. And conversely, specific learning outcomes can be adversely effected through the exclusion or lessening of the relevant contexts. Accordingly, if particular skills and abilities can be identified as being especially relevant to certain student needs, it will be possible to emphasize those contexts within the scope of community service learning projects as a whole. Thus, for example, since teamwork and management skills are prized by employers (Schools Program Branch of the Ministry of Education of the Province of British Columbia, 1992; Leroux and Lafleur, 1995) community service learning projects in which the collaborative and theoretical/reflexive contexts are highlighted should play a prominent role in those programs in which the development of employability skills is a priority. Similarly, if the goals of the program accentuate problem-solving and the development of community of practice knowledge then the situated and authentic contexts should play a prominent part.

A related issue regards the importance of the proper matching of students and clients. That is, as different situated contexts are conducive to the development of distinct skills and knowledge, so are the expertise, sensitivity, and other human attributes of the clients instrumental aspects of these contexts. As was seen in one project, the fitting of special student needs with a particularly skilled and sensitive client resulted in outstanding student development. While in another project, an insecure and/or unprepared client seemed to be the main cause of the project's termination and resulting student disappointment. In other words, an important aspect of the community service learning process involves the proper matching of student needs and client expertise while, at the same time, keeping in mind the effect of the overall environment on student learning. As will be

elaborated upon shortly, one of the means by which student/client matching might be facilitated is through the expectation that students participate in a variety of projects over their school careers.

The second requirement of a viable community service learning program regards the synthesis of in-class theoretical and reflective elements with the work place experience. Thus, for example, cognitive apprenticeship of project management, problem-solving, group processes, and issues concerning all aspects of service and personal development and reflection would have a formalized forum for teacher direction and group discussion. Additionally, channels for client/teacher communication could be established and integrated. In other words, although the work experience facet of community service learning is that which primarily distinguishes it from traditional forms of classroom learning, a complementary in-class aspect also has an integral role to play. As such, problems similar to those experienced by the school support worker and the elementary school web page projects, hopefully, could have been alleviated.

Perhaps the best means of meeting these challenges posed by the needs of implementing a community service learning program is through the development of a district wide community service learning curriculum.[16] Obviously, such a task demands a great deal of time and effort, certainly beyond the limits of what can be expected from a single classroom teacher. However, with support and commitment from school and district administration it should be possible to initiate a model to serve as the basis for a comprehensive program consisting of a permanent client base and standardized (but flexible) in-class component. Once the curriculum has been developed and tested, ongoing management will not have to be significantly more demanding than any other district service. Of course, like other such programs, the curriculum would require ongoing support from a district resource person or persons. One possibility in this regard is that a community service learning curriculum be consolidated with other community-oriented programs such as the Career and Personal Planning Program in British Columbia in which students must complete 30 hours of

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16. As a result of this investigation I developed an extensive and detailed community service learning curriculum. See Appendix B for the curriculum's table of contents.

work experience in conjunction with the classroom emphasis on the development of career and life skills (Province of British Columbia, 1994).

Another particularly germane method of helping to develop and implement a community service learning curriculum might be through the use of student projects dedicated to this end. In this regard, initial student projects could serve to promote the program and help develop a client base through, for example, the development and distribution of informational brochures and/or through formal presentations in the office of possible clients. In this way, not only would the developmental workload be lessened for the teachers, but at the same time, students would learn through doing a service for the school and district (i.e. community service learning).

In order to maximize student benefits of community service learning, one of the requirements of such a curriculum should be that students in the program participate in a variety of projects over the course of the year, or their school careers. In this way, students would be able to experience multiple environments in order to maximize their learning outcomes through immersion in a variety of contexts, each with its own special attributes. At the same time, a permanent client base would allow teachers to appropriately match students and clients so that their attributes and needs best complement each other. So, too, might such a process tend to minimize the risk associated with an ill-matched student and client having to remain together for an inordinate period of time.

In summary, this study suggests community service learning functions well to expand students learning beyond what is assumed and expected from conventional information technology settings and processes. However, in order it meet its challenges and potential, care and effort must be expended in the establishment of a curriculum and support base upon which all teachers, clients and other involved staff can draw. Furthermore, through engagement with a variety of projects students would be able to benefit from multiple situated contexts and a more extensive range of client skills and perspectives.

Concluding Thoughts

Possible Reservations Regarding Learning

The following paragraphs discuss potential criticisms of my findings concerning learning. The first two deal with the definition of learning and the third paragraph addresses the possibility that the determined learning was mainly a social construction. Thus, all arguments have repercussions regarding my findings that learning has occurred.

It is true learning is an amorphous topic open to a variety of interpretations. Basic dictionary definitions, like that which informed this investigation, describe learning in terms of the gaining of a skill, ability, and/or awareness. Other definitions might not entirely agree with this one, including instead the understanding that for true learning to take place there must be assurance of transference to multiple contexts and/or the surety that what was learned has become so ingrained so as to be retained for a significant period of time (Hall, 1989). Proponents of such a perspective would certainly be dubious about my assertions regarding the occurrance of learning. However, so would most traditional courses of study in which assessment is dependent upon a series of tests and assignments implemented during the duration of the class be hard pressed to justify that this more inclusive understanding of learning had occurred. In other words, my dissertation makes no claims about the meaning of learning that are not generally seen to be a part of existing educational practices.

Another perspective on learning argues that for learning to happen, one begins with the basic facts and builds upon them until reaching a complex and advanced state of knowledge. Such a position might suggest my "found" learning was not learning at all, but instead was the learners' gaining of familiarity with new environments and events. Nowhere have I demonstrated the students were involved in such a building process   However, in contrast to this perspective I contend a wholistic explanation of learning is more appropriate. That is, learners begin with an approximate understanding of the whole in which they are emersed and through their interactions are able to fill in many of the blanks and clarify their misperceptions (Marton & Booth, 1997). Such a process may account for the observations that the students were not generally confused or

immobilized when first beginning the on-site portions of their projects, but rather were able to begin from their general overall understanding, enlarging upon and fitting their new knowledge together as they progressed in a collective/constructivist manner. In this process of learning, then, the students will continue to move through life continually building upon evolving experiences and accumulating new skills and knowledge. Their evolvement with the community service learning projects will assume its own unique place and degree of importance.

Another possible criticism is that my conclusions about learning were in the eye of the researcher. That is, it can also be argued the determined learning outcomes are simply a construction of the lens I wore and the questions I asked (Edelman, 1989). Thus, if I had not been interested in group skills (because they are an aspect of situated learning) I may have not found them. However, it is significant to note that my two most consistent questions to students and clients were "what did you (or the students) learn?" and "what was most memorable about the project?" Obviously these questions are general enough to open the door to a potential myriad of unexpected replies unrelated to any aspect of my viewing lens. Thereupon, unless I missed or ignored such disparate responses, there appeared to be little testimony suggesting I pursue other thematic routes concerning the learning occurring in these projects. At the same time, though, I cannot categorically deny some of the learning which did transpire might be attributed to processes other than situated learning. Similarly, there were obviously other outcomes of which I remain unaware.

Future Research

Hopefully, this project is the first of many which attempt to investigate how the situated learning/community service learning relationship can help to implement both educational technology, and other fields of study such as English and Science. Specifically, concerning technology, it might be useful to investigate how different types and applications of various technologies are effected by community service learning. Regarding each of these, it would also be productive to not only focus upon student learning, as did this investigation, but also the learning experienced by the teachers and clients involved. So, too, might it prove useful to study other

effects on the particular client and community as a whole. Also, by comparing the resulting degrees of situated learning which occur across different disciplines, it might be possible to determine if some skills and abilities are more conducive to situated learning than others. Finally, future investigations could certainly be enhanced by adding a longitudinal component in order to determine the effects of situated learning over time. Similarly, it would be most worthwhile to be able study the degree to which situated learning, regarding both technology and other fields of study, is transferable to other environments.

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APPENDIX A: STUDENT SURVEY

1. Age____   Grade_____   Gender _____   Country of Birth _____

2. If not born in Canada, years living here_____

3. First language spoken at home_____

4. Number of other computer courses taken in school (not including this

one)_____

5. Number of other computer courses or workshops taken outside of school_____

6. How do you rate your computer skills compared to other people your age:

a) below average   b) average   c) a little above average   d) a lot above average

7. Plans after completing high school: a) work b) college and/or university c) technical institute

8. Probable field of study and/or area of work:

a) computers b) some other area of science c) another field

9. Reasons for registering in this course: (select as many as you wish)

a) interest in computers   b) help with future education c) just for fun d) timetable fit

e) no reason in particular f) other _____-

10. Before taking this course, how did you know what it was going to be about: (select as many as

you wish)

a) reading the course outline b) talking to someone who had taken it c) from Dr. Hinton

d) from another teacher or counsellor e) from the course title

f) other_____   g) I didn't know what it was about

11. My best subject at school is _____

12. My lowest marks are usually in _____

13. Generally, most of my marks in school are around A B C+ C C-

14. This class turned out to be what I expected:

a) not at all   b) sort of   c) exactly

15. Computer access: a) I have my own b) share with siblings c) use parents when they let me

d) don't have computer at home e) other_____

16 Internet use: a) never   b) occassionally   c) quite a bit   d) a lot   e) other_____

Thanks for your help

APPENDIX B: TABLE OF CONTENTS FOR THE COMMUNITY SERVICE LEARNING CURRICULUM

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