THE RELATIONSHIP BETWEEN ATTAINING ECOLOGICAL LITERACY

AND THE DEVELOPMENT OF A SENSE OF COMMUNITY

By

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Abstract

The intent of the study was to examine how attainment of ecological literacy through experiential learning can be enhanced with the development of a sense of community. Research was carried out with three classes of students enrolled in the Outdoor Ecological and Experiential Education program at Lakehead University to study sense of community and how it impacts on the development of ecological literacy.

Qualitative research methods were used to determine: (1) the characteristics of experiential learning groups that possess a sense of community, (2) methodologies for development of a sense of community to maximize individual learning experiences, and (3) effects of a sense of community on the development of ecological literacy.

Data was collected from three distinct classes (a specialization class, an elective class and a masters-level course) of preservice teachers enrolled in the Outdoor Ecological and Experiential Education program at the Faculty of Education. Overall, 67 students took part in the research project. Data collection methods included pre and post-course surveys, participant observation and selected interviews. Data was then analyzed to generate codes, and develop patterns and themes.

Findings were focused on three key areas: the characteristics of a sense of community, effective experiential learning activities that develop a sense of community and the effects of a sense of community on the development of ecological literacy. Themes of "shared commitment" and "action" appeared with regularity throughout the analysis of the data. A conceptual framework explains the link between the development of a sense of community and ecological literacy.

Acknowledgements

In casual conversation, I have often remarked how lucky I am to have been able to work with the best classes of students in the university. Indeed, the research participants are among some of the most insightful, brightest and interesting people I have met. Their creation of a community, both academic and personal, is truly inspiring.

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Chapter One: Introduction

The Research Problem

Overview of the Study

The intent of this study is to examine how the attainment of ecological literacy

(the understanding of complex ecological principles including one's own impact on the

ecosphere) through experiential learning can be enhanced with the development of a

sense of community (a feeling of belonging and commitment to a group). Research has

been carried out with three classes of students enrolled in the Outdoor Ecological and

Experiential Education program at Lakehead University in order to study both the nature

of a sense of community and how it influences ecological literacy. How does each class

of students come together as a community? And, can community development contribute

to effective ecological learning? The difference between class sets (a specialization class,

an elective class, and a group of masters students) assisted the researcher in analyzing

similarities and differences in order to uncover patterns and themes. Primary research

and the interview process took place over a period of eight months. Data was gathered

from 67 participants in an attempt to develop a conceptual framework explaining the

relationship between community development, learning and the growth of ecological

literacy.

The study is comprised of three important segments. The first phase involved the

planning process, a literature review and the development of a research proposal. Phase

two involved the gathering of data. The researcher gathered information on the three

classes through the use of survey data, participant observation and selected interviews.

During the third phase, the researcher analyzed data sources including the survey

responses, tape-recorded interviews and researcher's field notes to generate codes, and develop patterns and themes as they emerged from the analysis of the data.

Findings were focused on three key areas: the characteristics of a sense of community, effective experiential learning activities that develop a sense of community and the effects of a sense of community on ecological literacy. The researcher attempted to link a sense of community with outdoor settings, experiential learning and ecological literacy within a comprehensive pedagogical framework.

Background

The past forty years have been characterized by an ever-increasing awareness of human impact upon the planet. Carson (1962), one of the founders of the environmental movement, discussed the balance of nature as "a complex, precise, and highly integrated system of relationships between living things which cannot safely be ignored any more than the law of gravity be defied with impunity by a man perched on the edge of a cliff" (p.246). Today, most individuals involved in ecological fields firmly believe that "humankind, through our great numbers, technological and industrial powers, and political and economic conflicts have created a crisis in our relationship with the earth in the form of inestimable ecological damage" (Caduto, 1998, p.15). The future of life on earth can now be described as a "bottleneck", in which too many human beings requiring the use of too many resources to live at expected standards have created continually increasing ecological stresses on the planet (Wilson, 2002). Wilson notes that for "every person in the world to reach present U.S. levels of consumption with existing technology would require four more planet earths" (p.23). The effects of human population and consumption have created a situation in which the "Earth has lost its ability to regenerate

– unless global consumption is reduced, or global production is increased, or both"

(p.27). Indeed, we need a critical mass to act in an ecologically responsible manner to

affect positive ecological changes on the planet.

The first United Nations Conference on the Human Environment was held in

Stockholm in 1972. This conference was the first major gathering to "draw attention to

the global nature of environmental problems, to identify their impact on human health

and well-being and to suggest that environmental education be used as one means to shift

the pattern of human development into a more healthy, just and sustainable trajectory"

(Clover, 2000, p.213). A number of international conferences since then have reviewed

and re-emphasized the role of global environmental education; examples include, Tibilisi,

Rio de Janeiro and Thessaloniki (Clover, 2000; Knapp, 2000). These conferences have

worked to establish the goal of environmental education, in order to:

> … develop a world population that is aware of and concerned about the
>
> environment and its associated problems and which has the knowledge,
>
> skills, attitudes, motivations and commitment to work individually and
>
> collectively towards solutions of current problems and the prevention of
>
> new ones (Clover, 2000, p.214).

A great number of attempts have been made to strengthen and unify

environmental/ecological education to create a more just, sustainable society. It appears

the status of environmental education is growing. However, a number of education

theorists have noted several problems inherent in the system, and they have made

recommendations as to how ecological education can assist in reversing human impacts

on the planet (Jardine, LaGrange, & Everest, 1998; Knapp, 2000; Puk, 2002a; Puk and

Behm, 2001; Puk and Behm, 2003; Salmon, 2000; Van Matre, 1999). The general

consensus is that environmental/ecological education needs to renew its focus to that of

the 'big picture'. We need to focus education on the development of a sense of

interconnectedness and stewardship that allows us to exist in balance with the

environment (Caduto, 1998). Van Matre (1999) has advocated for changing

environmental education to 'earth education': "Earth Education aims to help people build

an understanding of, appreciation for, and harmony with the earth and its life" (p.83).

Puk (2002b) believes that all education needs to strive for ecological literacy.

Educational and government systems need to be reorganized with a dominant focus on

earth and environment:

> What is required is a fundamental shift in our daily thinking and
>
> behaviour. ... We all need to be shaken out of our naiveté and lethargy.
>
> Ecological literacy is not just another special interest initiative. It is about
>
> the survival of the ecosphere and everything in it. It is different and needs
>
> to be expressed as our first imperative (p.5).

This thesis examines further ecological literacy as the primary goal of ecological

education and how promotion of a sense of community may play a significant role in the

development of individuals who "strive to improve the human condition and the

environment within the context of self, human groups, the biosphere and the ecosphere"

(Puk, 2002b, p.4).

Research Statement

The purpose of this study is to examine how the attainment of ecological literacy

through experiential learning is enhanced with the development of a sense of community.

The problem identified is; what role does a sense of community play in the development of an ecologically literate citizen?

In response to the problem, the following research questions are addressed:

1.   What are student's perceptions of their sense of community?

2.   Which determinants play a significant role in the development of a sense of community?

3.   What is the nature of the community's development over time?

4.   What are the effects of a sense of community on the development of ecological literacy?

The researcher generated data to develop a conceptual framework connecting a sense of community with outdoor experiences, ecological learning, and most importantly, ecological literacy.

Key Phrases / Definitions

A Sense of Community: Chavis and McMillan (1986) define a sense of community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (p.9). For the study, the term "a sense of community" relates directly to respondents' feelings of belonging, contribution, investment, and safety within their specific learning group.

Outdoor Ecological and Experiential Education (OE3): This refers to an educational program developed by Dr. Tom Puk at Lakehead University in Thunder Bay, Ontario. Course content in the program focuses on experiential learning techniques and outdoor settings in an ecological education program for student teachers. Three distinct courses

(a specialization course, an elective course and a masters level course) are "based on the premise that through adventure programming, people discover various things about the ecosphere, about themselves, about others, about the natural world and the interrelationships that exist between these various parts of life and that personal growth will result from these discoveries" (Puk, electronic media, 2002c).

Ecological Literacy: Ecological literacy can best be described as an understanding of the principles of organization that ecosystems have developed to sustain the web of life. Capra (1996) explains ecological literacy as the insight and knowledge that is necessary in order for human beings to create and uphold sustainable societies. Puk (2002a) and Puk and Behm (2001, 2003) declare that ecological literacy needs to be expressed as our first imperative. As ecologically literate citizens, "we need to 'rethink' how we conduct our daily lives and the ways in which we interact with the environment – which presently are not ecologically sustainable ... (as well as) to "reconceptualize" our relationship with the ecosphere" (Puk, 2002b, p.5). Ecological literacy should be considered the overall goal of ecological education.

The Research Study

The Research Context – The Outdoor Ecological Experiential Education Program

Outdoor Ecological and Experiential Education (OE3) is an educational program created by Dr. Tom Puk (2002a) at Lakehead University in Thunder Bay, Ontario. All courses are designed with reference to Puk's *Meta-Framework for Ecological Literacy* (2002c). Central themes of ecological education (adapted in part from Van Matre, 1999), as stated in the meta-framework include:

1.   The boundaries of life on earth (the big picture),

2.   The ecological functions of life and how they work (the what),

3.   How these functions impact on each person and society as a whole (the

impact on humans),

4.   The changes each person and society as a whole need to undertake to

protect these functions (the changes required by humans) (Puk, 2002a).

Within this meta-framework the concept of a sense of community is one of four

major foci, the other three being ecological literacy, experiential learning and a personal

inner journey.

At present, there are three OE3 program courses. There is an elective course

designed for all preservice teachers at the Faculty of Education. The elective course is

based around activities that take place during an 'immersion' weekend at a local

environmental learning center. Students are then required to submit a course reflection

paper and a final project. The main preservice course is the OE3 specialization in which

students earn an Environmental Science qualification as part of their teacher certificate.

The course is much more in-depth than the elective course with respect to content and

student time involvement. Specialization students must attend weekly three-hour lessons,

participate in a three immersion weekends and design and carry out a variety of projects

and lessons. This group of OE3 students must also take part in two additional half-credit

classes that deal with community service and an authentic ecological group project. As

well, there is a Masters of Education OE3 course that examines theory and critical

perspectives of Outdoor Ecological and Experiential Education. Students attend one

three-hour class each week for one semester. The masters class may be taken as a core or

elective course.

There are a number of differences among the courses, including time, content, student backgrounds and personal interests, which enable the researcher to compare the classes with respect to ecological literacy and a sense of community.

Significance of the Study

The study has the potential to contribute to curriculum-based research regarding ecologically and environmentally based programs within both secondary and post secondary institutions, as well as in lifelong learning situations. The findings in this study convey the importance of the development of a sense of community for groups of students in ecological learning situations. As well, the identification of specific contributing factors to encourage a sense of community may assist educators with program development and implementation. It is hoped that the findings-based observations and recommendations will provide educators with knowledge and skills to effectively develop a sense of community in secondary school classrooms.

Results of the study contribute to preservice teachers' teaching methods for their own classrooms. Participation may allow individuals to further develop an awareness of the significance of a sense of community in experiential, ecological learning situations. This, in turn, may provide participants with the knowledge and skills related to improvement of sense of community allowing them to further develop as effective educators. The development of community also encourages a post-graduate support system among preservice teachers. A sense of community may be extended into the subjects' personal and professional lives with a sharing of teaching resources, as well as other professional and personal supports.

The research will contribute to the base of knowledge regarding the significance of a sense of community for groups of learners. Schaps, Lewis & Watson (1997) note that a sense of community has been shown to provide greater academic motivation, performance, empathy, conflict resolution skills and motivation to help others. Results of this study may further emphasize the importance of community in ecological learning environments. It is hoped that this thesis will provide a valuable contribution to the accumulated literature as well as the general field of study for both community and ecological education research.

Limitations

The limitations of the study are as follows:

1.   The intent of this research project is not to evaluate the Outdoor Ecological Experiential Education program for a sense of community but rather to analyze settings, activities and attitudes in order to develop a framework relating a sense of community with outdoor experiences, experiential learning, and most importantly, ecological literacy. Descriptions of participant attitudes may not adequately represent the experiences of the entire group, although they may portray a reasonably holistic picture of the general outlook and position of the class.

2.   The effects of the researcher's presence, opinions, prejudices and other biases on the data gathered may influence the validity of data collected.

Delimitations

The following items delimit the study:

1.   The size and selection of the sample may act to delimit the study. The site is
limited to one program at one faculty of education in Ontario.

2.   Time and resources may limit the amount of data collected. It may have been
beneficial to study similar classes across different years. One or two years of
additional data could provide additional depth and breadth to the data.

3.   Given time constraints, the nature of the design and demands of a graduate
assistantship, relatively little time was allowed for extensive note taking of the
direct observations of classroom activities; and most of the field data needed to be
gathered after students completed the day's activities. More time for in-class note
taking would have resulted in more up-to-date notes.

4.   The study was of a short duration, lasting only eight months from start to finish.
Not only was there a need to gather data quickly, but there was also little
opportunity to use participants' feedback for purposes of ensuring accuracy
(Patton, 1990).

Assumption

The validity of researcher interpretation is dependent upon the assumption that
study participants were honest in their responses to the pre and post-course open ended
surveys and to the questions in the interviews.

The Organization of the Thesis

The first chapter includes the rationale, key phrases, study design, research
context, limitations, delimitations and assumptions. In chapter two, a review of related
literature is presented, current to the completion of the study. Research design and
documentation of the research, data collection methods, and procedures used in collecting

and analyzing the data are discussed in chapter three. Data from the research is presented

in chapter four, while interpretation of findings, conclusions and implications for theory

and practice are outlined in chapter five.

Chapter Two – A Review of the Literature

Introduction

For this literature review, the author analyzed the current body of knowledge

relevant to community theory and environmental education. Sections have been

organized to present a comprehensive overview of the concepts of learning group sense

of community, education and ecological education and ecological literacy. The first two

sections are directly related to community. "A Sense of Community: A Background

Based in Sociology", provides a working definition and theoretical background of the

concept for the research project. The next part focuses on educational research and

theory connected to a sense of community. After the community segment, there is a

discussion of concepts and themes related to environmental and ecological education.

Models and trends of current ecological / environmental education practices are

explained after a brief introduction to Outdoor Ecological and Experiential Education, the

program within which the research took place. As the overall goal of environmental

education, ecological literacy is also discussed, since awareness of its components are

significant elements of the research. Finally, the author discusses the theory and research

that combines learning group sense of community with ecological and environmental

education.

Part One – A Sense of Community

A Sense of Community: A Background Based in Sociology

A sense of community can best be explained as a feeling of belongingness or

connectedness that an individual has with respect to his/her place in a specific group or

setting. This thesis was based around the definition proposed by Chavis and McMillan

(1986). They discussed four specific elements integral to a definition explaining sense of community.

The first element is membership. Membership is the feeling of belonging or of sharing a sense of personal relatedness. The second element is influence, a sense of mattering, of making a difference to a group and of the group mattering to its members. The third element is reinforcement; integration and fulfillment of needs. This is the feeling that members' needs will be met by the resources received through their membership in the group. The last element is shared emotional connection, the commitment and belief that members have shared and will share history, common places, time together and similar experiences (Chavis and McMillan, 1986, p.9).

Chavis and McMillan (1986) continued by stating, "a sense of community is a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (p.9). The work of these scholars has influenced various other researchers. Their definition and theory of a sense of community has been used extensively during the past fifteen years. Researchers have implemented their theory to examine a sense of community in gated communities (Wilson-Doenges, 2000), in the workplace (Burroughs and Eby, 1998), among educators (Rossi and Royal, 1999), and for students within school settings (Battistich, Solomon, Watson and Schaps, 1997; DeNeui and Lounsbury, 1995). As well, other studies have been conducted regarding

interpersonal aspects of an individual's sense of community including measurement (Chavis and Pretty, 1999) and social predispositions (Davidson, Cotter & Stovall, 1991).

Recently, Halamova (2001) from Comenius University in the Slovak Republic published the results of her research comparing McMillan and Chavis' academic theories regarding a sense of community with the more idiomatic theories of Scott Peck, M.D., author of several "self-help" books such as, The Different Drum: Community Making and Peace (1987), and A World Waiting to be Born: Civility Rediscovered (1993). The researcher administered questionnaires to 245 individuals to examine the group's sense of community with comparative scales. She reported that a significant relationship existed between the two scales including:

> strong relationships of both the scales separately with other
>
> criteria, such as satisfaction with the functioning of the group,
>
> perceived positive influence of the group on personal, family and
>
> spiritual life of its members, belonging to a group with shared sets
>
> of values and perceiving one's own group as growing (p.137).

Halamova (2001) concluded, in her report: "there is a common basis of psychological sense of community for all kinds of groups regardless of the specific context in which they exist" (p.146). This research further supports the appropriateness of Chavis and McMillan's (1986) definition and theory for use with students in educational settings.

As stated earlier, Chavis and McMillan's (1986) model of a sense of community was based on four components: (1) membership, (2) influence, (3) integration and fulfillment of needs, and (4) shared emotional connection (p.9). These components

underwent further expansion by other researchers. Rossi and Royal (1999) examined

teachers' sense of community and found ten dimensions of community for their

definition. Their definition was based on: shared vision, shared sense of purpose, shared

values, caring, trust, teamwork, communication, participation, incorporation of diversity,

and respect and recognition" (Rossi and Royal, 1999, p.261). Battistich, Solomon,

Watson & Schaps (1997) examined in their study of elementary school students three

components of sense of community: academic engagement, influence, and positive

interpersonal behaviour. Moreover, Halamova (2001) notes that, "by 1996, J. Hill had

reported almost 30 published research studies directly measuring psychological sense of

community" (p.138). She continued that many of the instruments for the studies were

developed for specific contexts or situations, so they may only be applicable for their

original purposes (Halamova, 2001). Therefore, it seems appropriate to this study to

employ components developed for the generic model and definition of a sense of

community, developed by Chavis and McMillan in 1986.

A Sense of Community: Research and Theory in Education

In the past few years, the idea of creation of a community of learners has been

rapidly gaining attention among educational circles (Crawford, 1999). Education can be

connected to the concept of "community through the assumption that learning is a

process of transforming participation in shared sociocultural endeavors" (Rogoff, 1994,

p.210). This infers that one of the primary methods of acquisition of knowledge is

through involvement in social groups. Dewey (1938) noted, "education is essentially a

social process ... this quality is realized in the degree in which individuals form a

community group" (p.65). Development of communities of learners may also be linked

to Vygotsky (1978) who, from a social constructivist perspective, determined that knowledge is collaboratively constructed from interacting with others. The following section examines the benefits of development of a sense of community for learners.

Benefits of a sense of community on learning.

From an educational perspective, "a sense of community may be defined as a continually evolving process whereby learners and educators interact and work collaboratively in an atmosphere of trust, belongingness, and respect toward shared common interests and commitment to common educational goals" (Manning and Saddlemire, 1996, p.43). The creation of a community of learners can guide students "to respect other people, their environment and their own learning" (Horsch, Chen & Nelson, 1999, p.224). Battistich, Solomon, Watson & Schaps (1997) note that when "community is established, students' needs are most likely to be satisfied, resulting in their becoming affectively bonded with and committed ... and therefore, inclined to identify with and behave in accordance with expressed goals and values" (p.138). As well, "the social interaction permitted by a community of learners allows greater learning to take place" (Bryant, 1999, p.110). Manning and Saddlemire (1996) explain the basic human need for belonging and a need to be a part of a group working together toward one particular goal: "Communities can provide this sense of belonging and feeling that collectively, people will work toward agreed-upon and shared goals ... in a more comfortable inspiring environment" (p.43). Finally, from a classroom perspective, it was determined that students with a high sense of community showed: greater academic motivation and performance, a liking for school, empathy and motivation to help others, and conflict resolution skills (Schaps, Lewis & Watson, 1997).

Elements of a community of learners.

Chavis and McMillan's (1986) four elements of a sense of community (membership, influence, integration and fulfillment of needs, and shared emotional connection) can have applications to educational settings. Indeed, these elements have been used by researchers examining a sense of community among educators (Rossi and Royal, 1999), and with students within school settings (Battistich et al, 1997; DeNeui and Lounsbury, 1995). Barbara Crawford, (1999) in her study of communities of learners in science classrooms, identified five integral components: authentic tasks, interdependency, negotiation of understanding, public sharing, collaboration with experts, and shared responsibility (p.703). First, instruction is situated in tasks based on issues related to the real-world. With interdependency, the second component, "group members function by relying on each other to complete a task" (Crawford, 1999, p.703). The third integral component is understanding, which is negotiated through students and teachers developing a debate of ideas. Fourth, ideas are publicly shared by students and teachers with other members of the class. Finally, responsibility for learning and teaching is shared among all students and teachers (Crawford, 1999, p.703).

Research conducted in California by the Child Development Project in 1990 examined the creation of caring communities in schools and their classrooms. Major components of the child development project included: extensive interaction among group members, collaboration toward group goals, division of labour among group members, mutual helping, use of reason and explanation, and explicit consideration and discussion of values relevant to the group activity (Schaps and Solomon, 1990, p.39). Although these components are different than those mentioned previously, they contain

some similarities such as the stressed importance of common goals, collaboration, and interaction.

Tools for creation of a community of learners.

A great deal of literature related to formation of learning communities has been produced by members of the Developmental Studies Centre in Oakland California. Schaps, Lewis and Watson (1997) provide four guidelines to strengthen community: (1) systematically build relationships with students, (2) involve students in setting expectations, planning, and problem solving, (3) help students get to know each others' strengths and weaknesses, and (4) downplay competition and public comparisons among students (p.15). These suggestions seem to be primarily related to increasing students' feelings of belonging. Schaps (1998), in a later study, discussed other methods of development of class community (p.8). He mentioned using class meetings to enable students to shape norms and practices, and solve problems. Secondly Schaps (1998) recommends activities that enable students and teachers to get to know one-another as individuals. He suggests using disciplinary approaches that engage students in "active self-improvement" rather than using rewards or sanctions. Schaps (1998) fourth suggestion is to use collaborative learning as much as possible as it challenges students academically and places expectations on students regarding respectful treatment of partners. Finally, he proposes "curricula that encouraged students to study ethical issues … such as what it means to be a principled, compassionate person, and what values enable diverse individuals to live together humanely" (Schaps, 1998, p.9).

As with the members of the Developmental Studies Center, many other theorists discuss the importance of student-centered strategies to enable learning group sense of

community (Bryant, 1999; Horsch, Chen & Nelson, 1999; Rogoff, 1994). Manning and

Saddlemire (1996), however, related the individual challenges of building community by

explaining that definitions of community are unique to each school, and "there is no

recipe for building community ... all should be linked by unified action that includes

shared values, conceptions, and ideas" (p.44).

Part Two – The Context of Environmental Education

Outdoor Ecological and Experiential Education (OE3):

Courses in the OE3 program use experiential learning techniques to educate

students about ecological issues. Courses are "based on the premise that through

adventure programming, people will discover various things about the ecosphere, about

themselves, about others, about the natural world and the interrelationships that exist

between these various parts of life and that personal growth will result from these

discoveries" (Puk, 2002c). At present, there are three OE3 courses, an elective course

designed for all preservice teachers at the Faculty of Education, a specialization course

that provides preservice teachers with an environmental sciences teachable subject and a

masters level OE3 course that examines theory and critical perspectives of Outdoor

Ecological, Experiential education. The program emphasizes the pedagogy involved in

teaching ecological literacy and geography/geomorphology, self-development through an

inner journey, team-building and experiential learning in the outdoors (Puk, 2002a).

Mainstream Environmental/Ecological Education

Ecological education: what is it?

Ecological education is an interesting mix of science, ecology and social studies.

Its value lies in its ability to impart ecological skills, attitudes, and knowledge on a global

scale. Following are the most consistently present elements that good ecological

programs include:

- The nature of global relationships,

- The ecological functions of life and how they work,

- The cycling nature of matter, and

- The interrelationships of life (Van Matre, 1999).

Much of the common ecological education teaching methodology is experiential,

based on the beliefs of Dewey (1995), who stated, "the active side precedes the passive in

the development of the child-nature; that expression comes before conscious impression;

that the muscular development precedes the sensory; that movements come before

conscious sensations" (p.21). In ecological education, students are expected to learn

about the earth through their own interactions with the planet and its natural systems.

"To learn from experience is to make a backward and forward connection between what

we do to things and what we enjoy or suffer from things in consequence ... it is an

experiment with the world to find out what it is like; the undergoing becomes instruction-

discovery of the connection of things (Dewey, 1985, p.147). Other important

components of experiential learning are sense of mystery, cooperative learning, and

reflection. Ecological education, in variations of this form, presently holds a global

educational presence.

At present, there is some controversy regarding the nature of environmental

education and what is actually taught to students (Hungerford and Volk, 1990; Puk

2002b; Van Matre, 1999). Some academics (Orr, 1992; Puk, 202b, Puk, 2003) have

moved to redefine the discipline as "Ecological Education" given that we need to make

the study of water, soil and air, flora and fauna and their interrelationships the priority of our educational system. Moreover, ecological education "involves values and moral issues as well as knowledge because it teaches about life – about human relationships and about interactions between people and environments" (Caduto, 1998, p. 13). As Van Matre (1999) has suggested, the term "environmental education" has become too broadly defined to include many things (such as studying math in the outdoors or group games). The urgency to decrease the stress on our ecosphere must be the paramount role of ecological literacy. Puk (2002a; 2002b, 2003) and Puk and Behm (2001, 2003) go even further by suggesting that ecological literacy must become a "meta-discipline". This is discussed in the following section.

Three common approaches to environmental education.

There are three basic models of delivery for environmental education, total inclusion into the school, infusion or integration of EE into specific subject areas, and the presence of a 'stand-alone' course in environmental science (or similarly named subject). Callicut (1996) stated that total inclusion involves complete 'integration of all other subject areas into an environmentally based education system, ... then environmental education can no longer be compartmentalized as a subject to be studied but that it, in fact, be the basis for the entire curriculum" (p.5). Obviously, total inclusion of EE into educational systems would require huge amounts of resources, including a rethinking of many of the western values present among students, teachers, parents, and administrators; however, many academics including Elliott (1999) Scott and Oulton (1999) and Bamford (1999) have written in great depth regarding the benefits of this model of environmental education.

Infusion/Integration of EE is relatively common in North America. In its most common form, "environmental education has, "typically found its home within the sciences or geography (Russell, Bell & Fawcett, 2000, p.200). This involves teaching environmental concepts within the context of the standard science lesson. It might also include outings to outdoor centers, where students are allowed to explore scientific processes related to the environment in the natural settings. Examples include topics such as weather, wetland ecology, soil sciences and ornithology. There has been a sizable amount of criticism regarding integrative environmental education. Jardine, LaGrange and Everest (1998) and Puk and Behm (2001, 2003) have examined the occurrence of curriculum dilution and fragmentation and found that when ecological education is infused into the existing curriculum quite often very little ecology is actually taught in lessons. Simmons (1989), Munson (1997) and Salmon (2000) have all noted a need for an improvement in, and greater varieties of curriculum materials. And perhaps most importantly, educators might not have proper training and background to provide for adequate integration of EE into other subject areas (Jardine, LaGrange & Everest, 1998, Knapp, 2000; Munson, 1997; Puk and Behm, 2001, 2003). Added to these barriers are additional administrative costs related to environmental education; along with teacher training costs there are expenses related to materials and outdoor components, among others.

Environmental education has been taught in some secondary schools as a 'stand alone' subject. In Ontario, many secondary schools offered an elective course in Environmental Science, although the Ministry of Education recently removed the course from the province's curriculum (Puk, 2000; Puk and Behm, 2001, 2003; Russell, 2000).

In North America, there has been a renewed call by many academics (Puk and Behm, 2001, 2003; Quincy, 1997, Salmon, 2000) for ecological education as a stand-alone subject. Quincy (1997) noted the value of environmental education as a separate course that it might be studied in depth like many other focused courses in secondary education.

One additional approach is proposed by Puk (2002a) and Puk and Behm (2003) who state that ecological education should be created as a "meta-perspective, composed of an enriched subject-matter including sciences, social sciences, and philosophy" (p.3). This follows a research report released by Puk and Behm (2001) which urged the Ontario Ministry of Education to "create compulsory, single focus ecological courses in secondary schools and integrate ecological education into other subject areas" (p.50). In the United States the Independent Commission on Environmental Education (ICEE) released a report in 1997 that outlined several recommendations, one stating that schools should offer environmental education as a 'capstone course' at the secondary level to integrate knowledge and skills gained from the social sciences and sciences (Salmon, 2000).

Challenges to effective ecological/environmental education.

Although some barriers to environmental education have already been discussed, the difficulties that modern educators may have with developing any of the four models discussed in the previous sections of the review of literature are addressed here. The following challenges to effective environmental education have been gleaned from a variety of sources including Simmons (1989):

- Teacher culture and perceptions
- Availability of appropriate materials

- Costs

- Restrictive Curricula

- Traditional perspectives of ecology (human/nature dualism).

The effects of teacher culture and difficulties of curriculum change are considered to be one of the primary barriers to environmental education. Difficulties arise with respect to teacher training and motivation (Munson, 1997). Many academics believe that "there exists an immediate and critical need for inservice teacher education in the field of EE" (Volk, Hungerford & Tomera, 1984, p.18). Others, including Jardine, LaGrange and Everest (1998) and Simmons (1989) observed that teachers strive to include EE but some of their teachings may be misguided due to lack of proper curriculum theory and materials. Materials are an important component of Simmons's (1989) study; however others including Munson (1997) and Salmon (2000) also noted the lack of proper environmentally focused scholastic teaching aids. Munson (1997) stated, "materials that are widely available tend to simply provide students and teachers with information on various issues rather than aid in the development of skills and willingness to accept environmental responsibility" (p.175).

Costs are considered to be a barrier because revision of curriculum requires capital for training and new materials. Russell (2000) mentioned that "funding represents a significant amount of work … while students contribute financially to the program, they do not bear the full cost, yet asking the Board for more funding may not be wise" (p.299). This statement explains the true nature of the cost barrier; even though students fundraise and supplement costs, administration simply may not see EE as important enough to incur the extra expenditures.

Present day curriculum can be seen to impact environmental education since some school systems may feel that there is no room in their existing curriculum to allow for the inclusion of environmental sciences. Salmon (2000) stated that the ICEE noted awareness, "that introducing environmental education into the curriculum can reduce the time available for teaching basic subjects" (p.7). However, utilizing some of the more progressive models of delivery could easily alleviate time/curriculum constraints to EE.

Perhaps the greatest barrier to environmental education in schools is the controversy over the traditional versus post-modern perspectives of ecology. Katherine Munson (1997) summed the controversy up with a statement; "Aspects of American culture form major barriers to realizing ecological literacy and sustainability through formal education" (p.174). Munson's account echos views held by many others, that is, there must be a fundamental change in western societal values (especially educators) if ecological education is likely to have any large-scale impact on populations (Bamford, 1999; Callicutt, 1999; Puk and Behm, 2001, 2003; Selby, 2000; Scott and Oulton, 1999). The consensus is clear, ecological and environmental education is about values, and ecological literacy seems an important value to hold.

Ecological Literacy

To many educators, ecological literacy should be the goal of all ecological/environmental education. That is, ecological education can be viewed as leading to a form of "literacy," of being well-versed about the environment. David W. Orr (1992) set up goals defining what all students, regardless of chosen careers and professions, need to learn. All students should possess basic knowledge of the following:

- ecological principles

- the laws of thermodynamics

- caring

- energy relationships

- cradle-to-grave analysis

- living properly on a location

- limits to technology

- optimal size

- sustainable agro-forestry

- sustainable economics

- environmental ethics

(Orr, 1992).

In his book, The Web of Life, Capra (1996) employed the concept of 'ecological literacy', to explain the insight and knowledge that is necessary in order for man to create and uphold sustainable societies. Thus, we need to understand ourselves as part of The Web of Life, and to study the ecosystems of nature. We have to understand the underlying principles of natural ecosystems, and to use them as our basis for building our own societies (Capra, 1996). Therefore, one can assume that ecological literacy is the capability for a deeper understanding of the global environment in order to enable analysis, synthesis, evaluation, and informed decision making as a global citizen. This means ecologically literate students will have the knowledge, tools, and sensitivity to properly address an environmental problem in their professional capacity, and to routinely include the environment as one of the considerations in their work and daily life. As well, Ecological literacy should be defined in terms of observable behaviors.

People should be able to demonstrate in some observable form what they have learned--
their knowledge of key concepts, skills acquired and disposition toward issues (Roth,
1992). Roth proposed the identification of three levels of ecological literacy:

- Nominal, indicating "ability to recognize many of the basic terms used in
  communicating about the environment and to provide rough, if unsophisticated,
  working definitions of their meanings";

- Functional, indicating "a broader knowledge and understanding of the nature and
  interactions between human social systems and other natural systems"; and

- Operational, indicating "progress beyond functional literacy in both the breadth
  and depth of understandings and skills"

  (1992).

Ecological literacy derives its focus from four basic issues that take it well beyond the
typical boundaries of science education, or any of the traditional disciplines:

- the interrelationships between natural and social systems;

- the unity of humankind with nature;

- technology and the making of choices; and

- developmental learning throughout the human life cycle

  (Roth, 1992).

These four basic issues are quite similar to the general goals of environmental
education as discussed by Van Matre (1999) and the premise of the Outdoor Experiential
Ecological Education Program at the Faculty of Education at Lakehead University (Puk,
2002c). Puk (2002b) described thirteen significant recommendations that are necessary
to educate for ecological literacy:

1. Creation of a new meta-discipline called Ecological Education.

2. Compulsory, discrete ecological courses

3. Sequential curricula

4. Experiential learning

5. A sense of community should be developed during the learning process

6. Funding is required for the development of outdoor ecological centers

7. Teacher training

8. Research funding for acquiring ecological literacy

9. Postsecondary education must provide leadership

10. Lifelong ecological literacy is the ultimate goal

11. Regional ecological centers should provide community resources

12. Intergovernmental cooperation, and

13. Health and environment are inseparable.

Indeed, as ecological literacy is the overall goal of environmental education, perhaps educational programs should begin to focus on the ecological aspects of the education rather than education that is simply environment-based.

Applications of Community in Outdoor, Environmental, and Ecological Research

At present, although many studies are available concerning various facets of a sense of community, there appears to be little significant research regarding environment/ecology-based education and community. Recently, there have been two separate comprehensive meta-analysis of environmental education research (Rickinson, 2001; Hart and Nolan, 1999). Neither study noted any research regarding environmental education and a learner's sense of community. However, as discussed earlier, a sense of

community is important to constructivist and experiential teaching methodologies, many

of which are used in ecological education. Crawford has discussed aspects of both sense

of community and constructivism in science classrooms (Crawford, 2000, 1999).

Crawford's research involved students enrolled in a high school ecology class. She

developed a model of collaborative inquiry that included many aspects of community.

Crawford's model includes six components:

1. Instruction situated in authentic problems

2. Focus on grappling with data

3. Collaboration of students and teacher

4. Connections with Society

5. Teacher modeling behaviours of a scientist

6. Development of student ownership (p.933).

The components contain similarities to Crawford's earlier research on community

(1999), as well as the integral determinants of sense of community development

uncovered by other researchers (Schaps and Solomon, 1990; Battistich, Solomon, Watson

& Schaps, 1997). This study, therefore, has some significance since Crawford's (2000)

work was with an ecology class; however, no mention was made of either ecological

literacy or the ecological context.

Horwood (1994) from Queen's University has published literature that examines

the relationship between a student's sense of community and the benefits of an integrated

environmental curriculum package that operated in some Ontario secondary schools. He

researched students involved in a program called TAMARACK, an experiential semester

that combined senior Ontario credits in environmental science, physical education, and

English.   Four factors were noted to be transcendent qualities integrating the TAMARACK curriculum: complete process, authenticity, community, and responsibility" (Horwood, 1994, p.94). It was noted that within the program, "students put very high value on the interactions among class members and on the communal good" (Horwood, p.96-7). As well, the researcher discussed the importance of community to the program because it, "promotes integration by providing the safe but stimulating climate within which students can begin to push back their unexplored limits and horizons" (Horwood, p.97).

Crawford's (2000) and Horwood's (1994) research provides theoretical knowledge of sense of community that is relevant to the field of Ecological Education. However, gaps remain with respect to the nature of sense of community's relationship with the acquisition of ecological literacy. Environmental education research for preservice-teachers may also be a valuable contribution to the field. Moreover, research into sense of community and development of ecological literacy should provide a valuable contribution to the field of Environmental Education, and education in general.

Chapter Three – Design of the Study

Overview

Based in grounded theory, this study aims to "generate or discover a theory, an

abstract analytical schema of a phenomenon, that relates to a particular situation"

(Creswell, 1998). Students from three classes of students enrolled in the Outdoor

Ecological and Experiential Education program at Lakehead University have taken part

in the research to assist in the development of a conceptual linkage of a sense of

community with ecological literacy, experiential learning, and outdoor settings. The

researcher made multiple visits to the field, collected interview and survey data, and

developed and interrelated categories of information to present a visual picture of the

theory (Creswell, 1998, Glaser and Strauss, 1967).

Research Design and Methodology

This is a qualitative and emergent research project, "evolving as the researcher

learns about the setting, subjects, and other sources of data through direct examination"

(Bogdan and Biklen, 1998, p.49). This research methodology was deemed most

appropriate because by studying individual's feelings of a sense of community it "aims to

uncover beliefs, values, perspectives, motivation and how all these things change over

time or from situation to situation" (Woods, 1986, p.4). Thus, the research takes the form

of *Grounded Theory*, in which the theory is revealed through ongoing data collection and

analysis. "It is wrested from the data in the course of research rather than being imposed

in a preordained fashion" (Lancy, 1993, p.10). As such, "a great deal of analysis was

located in the field with questions and answers developed as the researcher moved from site to site (Glaser and Strauss, 1967).

Participants were asked to complete initial open-ended surveys to assess individual and class knowledge and backgrounds concerning sense of community. The researcher, as a graduate assistant, took part in most class sessions, as well as recording on-going field notes. Field notes consisted of "descriptions of what is being experienced and observed, quotations from the people observed, the observer's feelings and reactions to what is observed, and field-generated insights and interpretations (Patton, 1990, p.242). Field notes acted as an important data-base for theory generation. Glaser and Strauss' (1967) constant comparative method (taking information from data collection and comparing it to emerging categories) was used to analyze field notes, survey responses and interview transcripts in order to generate codes, themes and develop theory. Post-course surveys and interviews were carried out to add to the final data analysis which was conducted to link the emerging categories and themes to the literature review. The large quantity of data gathered served to "saturate (or find information until no more can be found) the categories" (Creswell, 1998, p.56).

Questions

The primary research question is: **"How can attainment of ecological literacy through experiential learning be enhanced with the development of a sense of community?"** Other questions that are addressed include:

1. What are student's perceptions of their sense of community?
2. Which determinants play a significant role in the development of sense of community?

3. What is the nature of the community's development over time?

4. What are the effects of sense of community on the development of ecological literacy?

The Research Site

The research site is situated at Lakehead University's Faculty of Education department, in Thunder Bay, Ontario. Participant observation and survey completion took place at various sites depending on class location. Many classes were offered outside on the university grounds and in an adjacent wilderness area. Outdoor sessions took place regardless of weather conditions. Classes that took place indoors were organized in a traditional science laboratory classroom setting. The classroom contained tables for regular class activities, and a lab area for scientific inquiry. Immersion weekends occurred primarily outside at two local environmental learning centers. Both of the environmental learning centers contained indoor gathering places, bunkhouses for sleeping and plenty of access to wilderness for outdoor programming. Field notes were written at all of the above locations. Interviews were conducted in a classroom at the faculty of education building.

Sample Population

The primary sample population consists of three classes of students (a teachable class, an elective class, and a class of masters students) enrolled in the Outdoor Ecological and Experiential Education program at Lakehead University.

The elective OE3 class.

The elective course, ED 4338, involves six hours of outdoor and on-campus sessions and an 'immersion' weekend at a local environmental learning center. Students

submit a course log/reflection and a final project. Students in the elective program are all

registered in the Primary-Junior or Junior-Intermediate sections at the Faculty of

Education. As noted, the students registered in the course as an elective, so although

most students have an interest in ecological education, their primary learning focus is on

other aspects of education. Elective students typically come from a variety of educational

backgrounds. Approximately 25% of elective students are registered in the concurrent

education program, while the other 75% are "one-year" education students. All of the

students are between 22 and 30 years of age. There are equal numbers of males and

females in the classes. As well, there is a range of personal interests within the class,

from some students who have little knowledge and experience in the outdoors to a few

who are highly skilled and knowledgeable with respect to ecology and the environment.

The OE3 specialization class.

ED 4284, the specialization "teachable" course, provides student teachers with a

core specialization subject in outdoor ecological and experiential education. They

receive an environmental science teachable upon graduation. This course is much more

in-depth from a content and time perspective. Specialization students must attend weekly

three-hour lessons, participate in a three immersion weekends and design and carry out a

variety of projects and lessons. This course is the only one selected for study that is held

over two semesters. Specialization OE3 students must also take part in two additional

half-credit classes that deal with community service and environmental/ecological action.

For the community ecological service course, students are required to participate,

individually or in small groups, in local ecological or environmental initiatives. Students

volunteered in a variety of roles with a number of community ecological agencies, park

systems, and naturalist clubs. For their ecological group action course, students are required to decide upon, then design, implement and evaluate a specific group ecological initiative in which they all participate. For this class the entire group of students receives one mark.

All of the students in the specialization OE3 program are enrolled as "Intermediate-Senior" preservice teachers at the faculty of education. The majority of the students are between 22 and 30 years of age, with the exception of two individuals that are registered as adult students. There are approximately equal numbers of males and females in the class. These students will receive core subject certification in Environmental Science as well as another subject, usually Geography, but also in other subject areas. Most have university credits in subjects such as geography, environmental studies, natural sciences and outdoor recreation. Along with their educational experiences, the majority of preservice students also have relatively extensive interests and experiences related to ecology and the outdoors. Specialization students generally choose to come to this specific university to study in the OE3 program.

The masters OE3 class.

The Masters of Education OE3 course examines theory and critical perspectives in Outdoor Ecological and Experiential education. Students at the masters level take part in lessons and discussions for three hours per week for twelve weeks. Graduate students are required to take an active roll in on-line and in-class discussions, complete one major project and attend part of an immersion weekend in an outdoor setting with the preservice class.

Students enrolled in the masters OE3 course have the widest range of personal, educational, and vocational backgrounds. Students range in age from 25 to 45 years of age. Twice as many women than men are registered in the course. Since the class may be taken as an elective or primary core course, student knowledge, skills and interests varies widely. Students may range from having extensive knowledge of ecological curriculum development, teaching methodologies and natural history skills to having little awareness of the subject. There are also significant differences between educational levels as some individuals may just be starting their masters coursework, while others may be very close to graduation. While the other OE3 courses in this study are relatively homogenous with respect to culture, there are usually a number of international students in the masters program. In recent years, students from Singapore, China and Hong Kong have taken part in the course. English is a second language for all of the foreign students. With the range of experiences and knowledge, personal levels of ecological literacy also vary within the group. Some students may be highly ecologically literate while others may have little to no awareness of their place in the ecological world.

The interview sample population.

For the interview process, participants from all three courses were chosen through purposeful sampling; thus individuals were chosen based on their ability to provide responses in congruence with the developing theory (Bogdan and Biklen, 1998). Interview participants voluntarily selected themselves based on their personal interest in the research and their potential to provide responses that effectively support the data gathered in the survey research. Eight subjects volunteered from the greater sample to provide in-depth observations about the nature of their class' sense of community, and a

personal perspective regarding the relationship between ecological literacy and community. Interview participants proportionally represented the numbers of students for the three classes. Four individuals from the specialization class, three from the elective class, and one from the masters class participated in the semi-structured interviews.

Sample summary.

Across the program, the greatest difference between the courses (beyond curriculum) is the amount of time students spend together as a group. The specialized class spends a greater amount of time together (over 4.5 hours per week plus community service and group project time, plus three full weekends for a total of approximately 250 hours) over two semesters. The master's class spends 3 hours together each week (for a total of 36 hours) for one semester. And the elective class spends 6 hours of class time and one full weekend (for about 30 hours of class time) together.

Analyzing the three classes helped the researcher to compare the effects of time, academic commitment, student backgrounds and outdoor activities on the development of sense of community. Classes were also analyzed to determine differences in attainment of ecological literacy.

Data Collection

The primary method of data collection was through the generation of field notes gathered in the course of participant observation in the OE3 program. Initial and post-course surveys and semi-structured interviews also were conducted to add to the base of data, serve as a means of triangulation, and assist with data saturation. Field notes were generated during activities and from regular interactions with students throughout the

research period. Participants completed surveys at the beginning and end of the courses. The researcher interviewed and audio taped selected respondents. A record of important informal conversations with participants was kept as additional data. Some individuals who participated in the interview also provided access to narrative reflection papers submitted at the end of the course. This use of multiple data sources served to validate and crosscheck findings and the strengths of one approach can compensate for the weaknesses of another approach (Patton, 1990). Bogdan and Biklen (1998) state "many sources of data were better in a study than a single source because multiple sources lead to a fuller understanding of the phenomena the researcher was studying" (p.104).

Field notes and observations.

The researcher, working as a graduate assistant, participated as a "Teacher's Assistant" in the OE3 program. During the semester the researcher gathered field notes detailing course activities, class participation, student interactions, and discussions related to environmental issues and ethics. The purpose of accumulating observational data was to "describe the setting that was observed, the activities that took place in the setting, the people who participated in those activities, and the meanings of what was observed from the perspective of those observed" (Patton, 1990, p.202). These notes assisted the reader in "entering into and understanding the situation described" (p.203). Most notes were chronicled during and immediately after class sessions. As many classes were held outside, notes were often written in the science lab classroom or another university classroom following the outdoor activities. Informal conversations and interviews were occasionally conducted and added in with the course notes. Many student lessons were videotaped, which occasionally provided the researcher with additional data that was later

included into course notes. Observations will be referred to as (PO 1, 2) which means Participant Observation #1, page 2.

Open ended surveys.

Initial and post-course surveys were distributed to all research participants. Leedy and Ormrod (2001) explain the use of a survey as to summarize participant responses to draw inferences from the responses of the sample. Initial surveys helped determine participant's knowledge level, expectations and experiences regarding sense of community in OE3. The initial survey is found in Appendix A. Post-course surveys further examined participant's attitudes and experiences during course activities to determine their feelings regarding: (1) effective methods for development of sense of community, (2) characteristics of experiential learning groups that evolve as they develop sense of community and (3) effects of sense of community on the development of ecological literacy. The post-course survey is found in Appendix B. Participants completed in-class surveys at the beginning and end of the courses. Surveys were filled out both in the science lab classroom and at the environmental learning center classroom depending on time and course availability. References made to survey responses are referred to as (IS5, 4284, p.4) which refers to the Initial Survey, class Ed 4284, page four.

Interviews.

Participant interviews consisted of nine basic questions accompanied by probes, as necessary, to elicit greater description in responses, therein "filling out the descriptive picture" (Patton, 1990, p.294). Interviews were based on Patton's model of a general interview guide, used as a means of ensuring that the same information is elicited from

each person by covering the same material. Patton suggests the advantages to using this type of interview format include:

1. It ensures the best use of limited time available.

2. The approach helps make interviewing across a number of different people more systematic and comprehensive by delimiting in advance the issues to be explored.

3. It keeps the interactions focused but allows individual perspectives and experiences to emerge. (p.283).

Each interview was audio-taped and lasted for approximately 45 minutes. Appendix C contains the interview instrument. The researcher chose participants for the interviews through purposeful sampling; thus, individuals were selectively chosen for interviews "to facilitate the expansion to the developing theory" (Bogdan and Biklen, 1998, p.65). Subjects selected purposefully from the greater sample were selected by three criteria: they represented a characteristic example of each class group, they were interested in the research project, and they were able to provide a detailed and comprehensive analysis of their views regarding class sense of community and ecological literacy. Information gathered through selectively sampled interviews enabled the researcher to further refine developing theory and provide greater depth to the theoretical background already produced through the survey research (Bogdan and Biklen, 1998).

Eight taped interviews were collected during the course of the study. Each lasted from one half hour to one hour in length. All interviews were conducted on a one-to-one basis with the participant. Extensive consideration was given to participant's convenience and comfort. Semi-formal interviews were conducted primarily in classrooms at the faculty of education building, although some were conducted outside

on campus. Arrangements for time and place were determined according to participant preference; with schedules ranging from 9 a.m. to 9:30 p.m.. Pseudonyms were used to preserve student anonymity. Specific course participation (elective, preservice, masters) was identified. Interviews are referred to as (Interview #2, Nick), which simply infers a reference to Nick's interview notes.

Ethical Considerations

All research was conducted in accordance with the ethics procedures and guidelines developed by the research ethics board at Lakehead University. Before the commencement of data collection, the purpose of the study was explained verbally to the participants. They were also informed verbally, and in writing, of their rights as participants prior to involvement in the interview session. See Appendix D for Letter of Consent. The following information was explained to the participants.

1.   Risks/Benefits. There are no risks to the participants. Personal benefits may include opportunities for personal reflection to further develop an awareness of the significance of sense of community in experiential, ecological learning situations.

2.   Anonymity and Confidentiality. The names of all individuals are changed on all transcripts and in this thesis. All data is considered to be confidential and information that may personally identify the participant is excluded from the report.

3.   Right to Withdraw. Participants had a right to withdraw from the study at any time.

4.   Data Storage. In accordance with Lakehead University Research Guidelines, all data will be stored at the university for seven years.

5.   Results. Results from the research are available as the thesis is produced.

Data Analysis

An inductive approach was used to analyze the various data sources, to help answer the key question – *how can attainment of ecological literacy through experiential learning be enhanced with the development of a sense of community?* This approach is characterized by, "theory emerging from the bottom up, from many disparate pieces of collected evidence that are interconnected" (Bogdan and Biklen, 1998, p.6). Organization of the data involved continual analysis of field notes with the collection and organizing of all pre and post-course surveys and interview transcripts. Participant observation field notes and pre-course survey examination assisted the researcher with the initial development of theory in which to 'ground' the research; however, all data sources (survey responses, interview transcripts, researchers' field notes and reflection papers) were helpful in generating codes and developing patterns and themes as they emerged from the analysis of the data.

Bogdan and Biklen (1998) note this idea of analyzing and developing patterns while in the field is known as formal grounded theory. Glaser and Strauss (1967) assert that theories should be 'grounded' in data from the field, especially in the actions, interactions and social processes of people. This research often took the form of a "zigzag process – out to the field to gather information, analyze the data, back to the field to gather more information, analyze the data, and so forth" (Creswell, 1998, p.57). Initial participant observation and pre-course survey examination were key to the early development of theory related to the central questions of the research.

As the data analysis progressed, a constant comparative method of data collection emerged, whereby information taken from data collection was compared to emerging

categories (Creswell, 1998). Glaser's steps in the constant comparative method of

developing theory are as follows:

1.   Begin collecting data.

2.   Look for key issues, recurrent events, or activities in the data that become

      categories of focus.

3.   Collect data that provide many incidents of the categories of focus, with an eye to

      seeing the diversity of the dimensions under the categories.

4.   Write about the categories you are exploring, attempting to describe and account

      for all the incidents you have in your data while continually searching for new

      incidents.

5.   Work with the data and emerging model to discover basic social processes and

      relationships.

6.   Engage in sampling, coding, and writing as the analysis focuses on the core

      categories. (Bogdan and Biklen, 1998, p. 67).

      It can be further noted that although the constant comparative method is organized

in a series of steps, the process "goes on all at once, and the analysis keeps doubling back

to more data collection and coding" (Bogdan and Biklen, 1998, p. 67). The constant

comparative approach seemed appropriate to accommodate the multiple data sources, and

assist with the ongoing analysis.

      Data was collected and analyzed to the point of saturation. Information was

collected that continued to add to the research until no more data could be found, or no

more was deemed necessary (Creswell, 1998). The researcher considered the

accumulation of data sufficient as the information seemed to provide an accurate and

adequate statement of the deciding base of theory. "When the researcher is convinced that his conceptual framework forms a systematic theory, that it is a reasonably accurate statement of the matter studied, that it is couched in a form possible for others to use in studying a similar area, and the he can publish his results with confidence, then he has neared the end of his research..." (Glaser and Strauss, 1967, p.224).

Major patterns and themes that emerged included organized and setting-based contributors to sense of community, student's perceptions of the class culture and the relationship between the concepts of community and ecology.

Summary

Qualitative research methods are used as an appropriate method for determining the nature of sense of community growth among university students, as well as examining the relationship between students' sense of community and the development of ecological literacy. The use of survey data, participant observation methods and semi-structured interviews provides a detailed and complex understanding of the active educational systems and relationships.

The following chapters outline the research findings according to patterns and themes, examine the relationship between community and ecological literacy through development of a conceptual framework, and provide recommendations for educational use and further study.

Chapter Four – Presentation of Research Findings

Introduction

This chapter contains a description and analysis of the gathered data in order to provide a comprehensive depiction of the nature of community development and its relationship with ecological literacy. The post-course surveys served as the primary focus for data collection, although information gathered from participant observation, interviews and narrative papers were all significant contributors in the development of the conceptual framework.

Major categories and themes that emerged from data collection are summarized and explained within the framework of the original research questions. The themes of shared commitment and action were commonly represented through the majority of the data collection. Therefore, both themes of action and shared commitment are employed throughout chapter four as headings to describe and categorize the information collected throughout the research process.

Through ongoing data analysis, the following sections were organized to represent the original research questions:

1. What are student's perceptions of their sense of community?

2. Which determinants play a significant role in the development of sense of community?

3. What is the nature of the community's development over time?

4.   What are the effects of sense of community on the development of ecological

literacy?

The four research questions are reflected back into the presentation of research

findings through the major headings in this chapter. The section, "A Perception of Sense

of Community" is used to reveal students' feelings regarding their communities as well

as to explain prevalent themes uncovered in the research.   "Community Determinants"

examines a list of the eight primary components that contribute to community as they fit

into the categories of shared commitment and action. "Community Development"

explores the growth and attainment sense of community for the three sample classes.

Finally, student perceptions regarding the association between community and ecology

are exposed in the section, "Community's Relationship with Ecology".

Research findings are presented according to the above topics. Where applicable,

information is provided for specific course groups in order to compare and contrast the

difference between courses. Significant observations are described along with references

to survey, interview, or participant observation notes collected. The greatest challenge

involved organizing and establishing a relationship linking the above questions into a

comprehensive theoretical framework relating sense of community with ecology.

The Perception of a Sense of Community

One of the prime objectives was to examine the development of a sense of

community for all students participating in the research. This was accomplished by

studying students' perceptions of their own class communities. As well, the themes of

action and shared commitment are developed to organize levels of community

development among the three class groups. Action and shared commitment are also examined in terms of their influence on the remainder of the research project.

Student Observations Regarding Sense of Community

It has been determined through survey data, that among all courses, students felt a strong sense of community within their respective OE3 class. In fact, all 54 survey respondents remarked that some sense of community had developed within the class. A strong majority of students noted that a very strong sense of community had developed. The first Post Course Survey Question was; "Do you feel a sense of community was attained in this course?" A typical answer: "yes, on a personal level we are a lot closer now than we ever were. I think we are more comfortable now in sharing our perspectives and views, no matter how unique/different they may be" (PS1, 4284, p.2). The established community among the students was based on personal comfort, trust and respect.

> Yes, community is about working together to achieve a goal, and I believe
> everyone pulled together to work as a community ... helping each other
> out along the way ... an atmosphere of trust and respect was established
> from the beginning of class, which also demonstrated a sense of
> community (PS1, 4438, p.2).

For many of the students, the development of sense of community carried on outside the course. Students mentioned, "over time a connectiveness developed between all the members of this class to the point where many activities outside of school were organized" (PS1, 4284, p.2).

I do remember on the Saturday night, we all were sitting around the fire

and we just started telling like, kind of like skeletons in our closets, when

was your first kiss. And it went around and everyone said when their first

kiss was. To me that's like, definitely a sense of community because

pretty much everyone was there, and everyone was sharing personal things

... that was outside of the group, like later on, at night (Interview #2,

Sara).

Students in all classes saw the community as growing over time, "evolving as

time increases" (PS7, 4284, p.2). "Over time the bonding of the group became only

stronger" (PS7, 4284, p.2). "It definitely became stronger throughout the year; towards

the end I felt it was more like a true community in that we all weren't just trying to please

each other or gain status in the group" (PS7, 4284, p.1-2). "Everyone became more

comfortable with each other ... friendships formed, walls broke down ... inhibitions

deteriorated ..." (PS7, 4438, p.3). Many students in the shorter elective course felt that

increased course time would have allowed for further evolution of community.

Maybe I'd have a couple of classes afterwards too. You are almost

a little like, cut off. As soon as the class is over you are cut off a little bit

from the rest of the class. You don't really see them ... but if you had a

couple of more classes afterwards something more might come of it.

(Interview #6, Nick).

We began with really no sense of community, as we didn't know each

other. Over class time, we got more comfortable around each other and a

loose sort of community was formed. By the end of the weekend, lots of

people were comfortable with everyone else in the group … it would have

been interesting to see how these would have developed had we had a

longer period of time (PS7, 4438, p.2-3).

Shared Commitment

Shared commitment serves as a recurring theme that prevails throughout the

course of the data collection. For the purposes of this research project the term "shared

commitment" is used in reference to feelings of autonomy and personal connectedness

within one's community. Shared commitment can symbolize students' willingness to

work collectively with a greater likelihood of learning motivation as well as a positive

view of personal and educational processes (Schaps, Lewis & Watson, 1997). As noted

earlier, all students involved in the research stated that a significant sense of community

had developed within their class. This means all classes reached some stage of shared

commitment. However, the level of shared commitment was notably stronger for those

in the specialization class based on students' perceptions of autonomy and external nature

of the group. This will be discussed further in the section on the topic of community

development.

The theme of shared commitment is also present in data collection as a type of

community determinant. The concepts of Shared Common Goals/Purpose, Intimacy, and

Focus on Community all serve to develop shared commitments within a community.

These concepts will be discussed in detail further in the chapter.

Finally, the term shared commitment may also be used in reference to the relationship between community and ecology. Commitment is a term widely used to denote individuals' relationships with ecological systems. Using the term in reference to community development further explains the relationship between community and ecology.

Action

The term action occurs frequently as a prevalent theme in the research. Action can be regarded as an advanced level of community development. Once students reach a significant level of shared commitment they may be able let go of preconceived personal goals and ideas to collectively act within their learning environment. For members of the specialization course, participation in an authentic group ecological action project allowed for further development of sense of community as well as an opportunity to exercise community action. Details and observations regarding the specialization course's authentic group project will be expanded upon in the upcoming section on community development. The theme of action also occurs within the context of ecological education, as effective ecological education promotes some personal or group change. Finally, action is listed as a component of community determinants. Cooperative activities, varied sub-groups of students, physical challenges and shared living activities are all determinants that contain an active focus. It was noted that students among all three classes felt that there was an active or physical component to the formation of their communities. A significant number of students mentioned that course activities encouraged them to actively work together. "The activities we participated in

required teamwork, co-operation, and close interpersonal learning strategies" (PS2, 4338, p.1). "It brought us all together through the trips and activities; by making us rely on one another for support ... it developed our team building skills" (PS2, 4284, p.1). "Learning together by doing always bonds people" (PS5, 5634, p.1).

Experiential learning, as a form of action, played a large role in the perception of an active class community. "Experiential learning, in its truest sense, begs for people to come together and share talents and resources to make things happen. By nature, experiential learning creates community in a group that is consistently learning together" (PS5, 4284, p.1). Evidently, many students felt "doing things together was a faster way to build community ..." (PS5, 4338, p.1). "Because it was experience by doing, not by writing/researching we physically and mentally had to work with our group; learning and sharing together as a group ... helped form a community" (PS5, 4338, p.3).

Community Determinants

The following community determinants were uncovered as important aspects in the development of a sense of community for students in all three class groups. All of the determinants were used by the instructor with each class. The first four, cooperative activities, varied sub-groups of students, physical challenges and shared living activities fit as components of the recurring theme of action. These determinants relied on action or activity to develop community. The following four determinants, common purpose/goals, intimacy, focus on community and time used the theme of shared commitment as a community development tool. Each determinant will be examined in further detail.

Cooperative Activities

A significant majority of students from all classes felt that the many cooperative activities used by the instructor played a large role in the development of community. Forty-five of fifty-three survey responses mentioned cooperative activity or specific cooperative activities as important in the development of their sense of community.

One example of a cooperative activity used by each of the three course groups is the student creation and use of a "low-ropes course". After receiving instruction regarding a variety of simple knots, the students were required to tie a length of one-inch thick rope, at about chest height, between two trees. The students were then required to assist each other with a series of physical maneuvers on the rope. Each group of students needed to work together to complete each task while providing safety and support for each other. Many of the "on-rope" challenges were physically demanding, yet with teamwork and perseverance everyone was able to complete all of the tasks (PO, 4284, p.7).

"The games and group activities helped us to get to know each other, relying on others in a group builds up trust" (PS2, 4284, p.2). "The activities we participated in required teamwork, cooperation, and close interpersonal learning strategies" (PS2, 4338, p.2). One respondent mentioned the importance of cooperative games in the initial development of the community.

So all the cooperative games, the name stuff at the very beginning; to me that's crucial... The name stuff is so important because that's your most

personal thing. ... that sort of hooks you in right away and doing all of the

cooperative stuff and learning from each other. ... It was a good co-

learning co-constructing kind of thing (Interview #8, Kelly).

It can be noted that the use of cooperative learning exercises encouraged

teamwork, trust, and full participation within all class groups. Sense of community was

established by "everyone's participation in all events together and the level of support

offered by individuals in the group" (PS2, 4338, p.2).

Varied Sub-groups of Students

One important community-building strategy implemented in the cooperative

activities as well as other course assignments was the constant mixing of group

participants for each exercise. Engaging varied sub-groups of students encouraged

everyone to work with each other, and thus all class members become acquainted on a

personal and academic level. Constant variation of sub-groups allowed individuals to get

to know one another quickly. This seemed especially effective for the elective groups, in

courses that ran for only four weeks.

The constant switching of groups, like whenever we were doing activities,

you meet all sorts of people and get closer to them. I liked that a lot. It's

almost so you couldn't form a clique. You would always be switched. It

would be good if you could find a way to interact with everybody in class,

but that would be tough. No, I think he did it pretty good; just counting

everyone up and switching groups all of the time. It was fun (Interview

#6, Nick).

I liked how the groups were always rotated so you were never with the

same people at the same times. So you wouldn't form, like a clique

because you were always mixing and matching different groups. You got

to know all different kinds of people, which was good (Interview #2,

Sara).

Constant group variation seemed very effective as a means of establishing or

initiating sense of community among classmates. The group work "allowed everyone to

work with everyone else at least once in the class" (PS2, 4284, p.2).

Physical Challenges

Physical challenges, as another component of "action", encouraged individuals in

the classes to participate in more that just a "cerebral" manner. Many of the experiential

lessons, such as the low-ropes course, required physical problem solving. One example

of an interesting physical endeavor was a climbing wall activity that was used by the

elective classes and the specialization group. On the weekend outing, students were

separated into groups to work as a team to get everyone to climb over a seven-foot high

wall. The activity first took place on the Saturday morning of the immersion weekend,

then again on Sunday afternoon just before the ride back to campus. Before each

attempt, the groups were provided with time to strategize. On the Sunday attempt, the

groups were encouraged to complete the climbing wall task in less time. Some students

needed a great deal of assistance to climb the wall, while others were self-sufficient.

However, everyone needed to work together as a team to physically complete the task in

the most efficient manner. The physical nature of this challenge greatly encouraged communication, trust, physical action and support among the participants.

Practically all of the outdoor and cooperative activities involved an adventure component that required movements such as climbing, hiking, running, skiing, or physically acting. Often the physical movement was accomplished in conjunction with other members of a group. "Each individual pulled together to accomplish different tasks" (PS2, 4338, p.2). The help and support necessary for a group to achieve a physically demanding task encouraged members to communicate, build trust and work together. "Physical problem solving challenges required us to work together at all times" (PS2, 4284, p.3).

Shared Living Activities

This is the fourth and final source of action that acted as a community determinant. Students who participated in the elective OE3 courses and the specialization class were required to participate in "immersion weekends", held at a local environmental learning center. Participants traveled by bus to the center, leaving the university campus around 4:00pm Friday afternoon and returning on Sunday around 4:00pm. Over the course of these weekends students participated in a variety of outdoor, experiential and ecological activities. Along with academic activities, course participants were required as a group to participate in regular activities of daily living. This activity of living together served as an act of sharing "food, clothing, experiences, personal thoughts and values" (PS2, 4338, p.3). Sharing and working together with activities of daily living, in turn, built teamwork skills and brought the group together as a whole.

"There was a lot of teamwork skills. We cooked, ate, slept, and helped each other out. We needed a good system to function properly" (PS2, 4338, p.1). A significant number of survey respondents noted that the weekend trips were integral in the building of a sense of community. Community was built "by spending time together, especially on the overnight trips; caring for people and knowing and working with each other" (PS2, 4284, p.2).

Although students in the master's level OE3 class did not participate on overnight excursions, one participant noted, in interview, the importance of an activity that had a different person bring food to each class. "The giving of your resources to others ... is the ultimate act of altruism. Food is a big thing. People resort to familial actions when you put food in from of them" (Interview #4, Lauren). As an activity of daily living, the sharing of food also served as an important component to the building of community.

Common Purpose/Goals

The concept of common goals represented the first community determinant that was based around community shared commitment. As all of the students enrolled in the faculty of education are aspiring teachers, there is a commonality running among all members of the three course groups. Beyond teaching aspirations though, a large majority of students signed up for OE3 classes because of a personal interest in the outdoors and specifically, ecological education. This commonality was very apparent with the specialization class. One survey respondent noted the "sharing of common views (and) sense of mission in the world for ecological action" (PS2, 4284, p.2) as an important feature that brought the class community together. Many students felt the

course content, ecological education, provided an important focus for development of sense of community. "I think that all of the members of this community already possessed similar/strong feelings about ecological education ... that's why we are all here. Of course this is a unifying factor" (PS3, 4284, p.3). The fact that the majority of students enrolled in the specialization course chose to come to Lakehead to study in the OE3 program guaranteed the common focus. "It provided a common theme that everyone was interested in" (PS3, 4284, p.2). "We all came with apriori knowledge and backgrounds that were very similar. We have a common cause that may not be mainstream (yet) so it fosters a degree of unity" (PS3, 4284, p.1). "The 'course' played the role of bringing a fantastic group of ecologically concerned and knowledgeable folks together and we ran with it from there" (PS3, 4284, p.1).

Although not as prevalent as the specialization group, students in the other OE3 classes also mentioned the role of common goals/interests as important in building class community. More often though, students at the elective and masters level felt that a similar educational focus for a course of study, as though it could be any course like educational psychology or math, brought them together rather than a vested interest in the subject matter of the course (involving personal values regarding ecology and the natural world) itself. "It made us think the same things (take into consideration the same aspects)" (PS3, 4338, p.2). "I do feel that content did somewhat improve the sense of community as it provided a common interest amongst us all" (PS3, 4338, p.3). "The course content ensured we all had a common ground" (PS3, 5764, p.1). It appears the common focus among the elective and masters groups was based more on the idea of a similar course content rather than a vested interest in ecology and nature (as that with the

specialization class). However, the presence of a common goal or focus was important for each class to establish a sense of autonomy in their community.

Intimacy

Another determinant that helped to create a feeling of shared commitment among all course participants was intimacy. "Immersion" weekends served to bring students away from their usual learning environment to a more personal setting. Groups spent the weekend alone as a class, without interruption from daily academic routines and the distracting nature of city and university life. Even while attending OE3 classes at the university, the majority of classes took place outdoors in more intimate areas away from other classes of students. The "Outdoor Classroom" was located in a wooded area alongside a small river. Students from all three course groups took part in cooperative and educational activities in the forested area. Course activities in this secluded wilderness area increased the level of group intimacy, allowing students from all groups to focus only on the learning at hand and their interactions with the class community. "It took us away from all the distractions and forced us to get along together" (PS2, 4338, p.1). Sense of community was achieved "by removing us from our 'normal' environment, putting us all on an equal plane, having us engage in activities where we had to rely on one another, and providing no human contact outside of our group" (PS2, 4338, p.3). Intimacy promoted a shared sense of commitment to community by allowing individuals to work together, build trust, and focus on common goals without interruptions from outside sources.

Focus on Community

Although many communities are built "spontaneously", a focus on community building was helpful to assist in the development of a sense of community for the classes within a short period of time by creating an understanding of the shared commitments within each class group. This seemed especially useful in educational settings where students only worked together for one or two semesters. For all course groups, the instructor made it known early in the course that one goal was for all of the students in the class to come together to work as a community (PO, 4284, p.5). All students recognized the importance of working together as a cohesive group and responded accordingly. "Community development started with strong prompting from instructor and then continued under our own volition" (PS2, 4284, p.1). Many students felt the instructor "made it very clear that a strong community was one of the primary objectives of the course" (PS4, 4284, p.1).

For the specialization class, one activity that was instrumental in the establishment of community was the presentation and signing of a "Swan". The swan was an oath or declaration of how students and the instructor would act within their class group. A number of students from the specialization group explained how the use of the swan focused their full attention on the building of community.

I think it's interesting because when I was writing my personal narrative it kind of came to me that it all really started with the swan, at least for me, and I don't think I'm wrong that that's what really started everything because we were really given a framework by which we

needed to conduct ourselves. That framework really gives a lot of the

cornerstones to community in terms of respecting individual differences,

always trying your best, have integrity, look out for others, expect from

others what you expect from yourself. ... and I even wrote in my personal

narrative that I think it's interesting that a small piece of paper could have

spawned such a larger thing (Interview #3, Sylvie).

Time

As noted earlier, the community determinant of time represents a component

within the theme of shared commitment. Moreover, the concept of time served to

differentiate the acquired level of community for each course group. Overall, each

course group spent different amounts of time together. The specialization class spent the

largest amount of time together as group, approximately 100 course hours plus three

weekend "immersion" trips. The elective classes spent six hours in course time with one

"immersion" weekend. The masters level class was together for approximately 36 hours

of class time plus one weekend session. As expected, the specialization class reached a

higher stage of community than the others "by spending higher than average (for school

groups/classes) amounts of time together" (PS2, 4284, p.3). "Time. I think that the sheer

amount of time spent with this group (the majority of our classes, common interests and

thus extra curricular and social interactions, etc.) was the predominant force that brought

us to this point (PS2, 4284, p.3). Students in the specialization class also organized and

attended many activities outside the faculty of education (for example, slideshows,

potlucks, hiking trips, etc.) for themselves as a class group, allowing them to spend even

more time together as a community. It will be noted later that specialization students

spent so much time together in academic and social settings that they also developed their own external social community.

Students who participated in the elective courses recognized that the time spent together on "immersion" weekends greatly assisted in the development of sense of community. "The activities in the earlier class allowed me to become familiar with the classmates, but when we got together on the weekend, the relationships were solidified" (PS2, 4338, p.3). However, it was also mentioned that additional time together might have further strengthened the sense of community for students in the elective classes.

> The trips are always fun. You always want to stay more. So maybe try to
>
> stretch it out for a day or two more. ... maybe I'd have a couple of classes
>
> afterwards too. You are almost a little like cut off ... but if you had a
>
> couple of more classes afterwards something more might come of it
>
> (Interview #6, Nick).

Although students from the master's course did not mention the concept of time as a determinant of their sense of community, their expressed level of community (based on the concept of shared commitment) seemed equivalent to that of the elective group. This is expected considering the masters and elective classes spent approximately the same amount of total hours together.

Community Development

Shared Commitment

The level of shared commitment, as applied to community development, was assessed through two methods: by determining the classes' perceptions of autonomy through the role of the instructor in the community and by examining the external nature of each course group. The following sections contain observations regarding each course's level of shared commitment achieved during the study.

External nature of the group.

The amount of time that the class groups spent together in activities based outside of the Faculty of Education had an impact on student perceptions of shared commitment in the class community. As expected, students in the specialization class spent more time in activities external to the university setting than the elective classes and the master's group. Specialization students took part in a variety of external activities including: potluck suppers at student's homes, camping trips to local wilderness areas, slide shows, and other forms of local entertainment. Specialization students saw their community as more than an academic class.

> Our community, or most of it, extends beyond the walls of our classroom
> and has become an integral part of our lives on the whole. The instructor
> cannot see the way we interact outside of class, or on a social level, or
> with whom, because he doesn't participate in that aspect. Much of what

goes on outside affects the way the community functions as a whole and within the classroom (PS12, 4284, p.3).

While not everyone participated in all activities, there was a general feeling of inclusion in any activity that was being planned.

> I didn't really participate in the social aspects of the community, to be honest with you. That was difficult for me because I've always been participating in the social aspects of any community. This is the first time that I haven't really been able to ... It didn't impact my role in the community at all. I thought it was interesting, I guess because I have an outside view of it, that was outside of the faculty of education, in the first semester there was a lot of all inclusive group activities and then after Christmas people really began to develop relationships ... I though it was great. The whole year, such an interesting group, people continuing to develop relationships with one another. ... there was never a closed-door feeling to any of it. Because, I think the first time I went out with everybody was last week; and, I continued the whole year to be invited. ... this is the whole community significance, that they never gave up (Interview #3, Sylvie).

Besides one noted occurrence, students from elective and masters groups did not seem to partake in any significant activities together outside of the academic environment. However, individuals from both groups did note the desire to spend more non-academic time with classmates. "I thought we would meet outside of class – a good

way to create the sense of community is to meet at the professor's house for/after last

class" (PS7, 5634, p.1). "On the bus ride home we were talking, like, why don't we go

on a hiking trip and stuff; but then we haven't really talked since so ..." (Interview #6,

Nick). During interviews, two elective students did mention an occasion at night around

a fire, on an immersion weekend where most of the class members were interacting

outside of the academic setting. "Most of the class stayed up and we just talked and

played ... we had lots of good conversation. We didn't have to do that, but we wanted

to" (Interview #6 Nick).

Perhaps, with more time together, students from elective and masters classes may

have been able to develop external social activities, and thus further develop their sense

of community.

Autonomy.

Each course was carried out in a manner that attempted to have students develop

their own sense of community. Participants in each course were asked about the role of

the instructor as a determinant of their level of autonomy in the class community.

Individuals in class communities that experienced a greater shared commitment tended to

view the instructor as willing to share the development of sense of community by

relinquishing direct control of the group. This was a common theme among survey

respondents in the OE3 specialization course. A significant percentage of students in the

specialization class noted that the instructor played a supportive rather than authoritative

role in their community. In fact, many students considered the instructor's supportive

role as an important feature in the formation of their community. "A passive role – very

important to creating a community" (PS4, 4284, p.1). The instructor "prescribed assignments that allowed us each to play our role. By taking a step back from us, we became more involved and took greater ownership over our projects and towards one another" (PS4, 4284, p.1). "His role ... may have assisted the group in becoming a community on our own terms. I believe this community was developed by the people in it ..." (PS4, 4284, p.2). For the specialization class, that perception of the instructor being a supportive facilitator in their group indicated advanced student autonomy within their class community. The greater sense of shared commitment developed by the specialization class facilitated the creation of action within the community

Students in the elective and master's level courses had varied perceptions of the role and participation of the instructor. For both classes, approximately equal numbers of students remarked that the professor either controlled or facilitated the class community. Elective students provided the following comments. "He was a facilitator, showed some emotion occasionally, but usually sat back and watched which I liked. The community was created on its own" (PS4, 4338, p.2). The instructor "gave structure, coherence, common goals ... brought new activities and assignments to students" (PS4, 4338, p.2). "The instructor was a part of the community as well, which helped to develop a greater sense of community" (PS12, 4338, p.2). Masters students provided similarly varied comments. "The instructor was very persuasive and powerful in helping us realize the problems and encouraging us to arouse our own responsibility towards the outside world" (PS4, 5634, p.1). "He seemed to remain outside of the community. Perhaps this encouraged us to move closer together" (PS4, 5634, p.1). As well, many students in the elective and masters courses were also unsure about the level of the instructor's

involvement. This infers that those students did not reach the same perception of autonomy as those in the specialization class.

In truth, the professor's role was similar for all classes; yet, it was confined differently in each class by time (the specialization class spent much more time together). Time, as a community determinant, became the structure that impacted the instructor's role among the three classes. This scattered perception of the instructor's role shows the impact of time as students in both the elective classes and the masters class did not quite reach the level of community autonomy and shared commitment for their communities. Students in the specialization class, however, with much more time together developed an increased level of autonomy, which indicates a stronger level of shared commitment. This, in turn, enabled students in the specialization class to harness their cooperative energies and progress to a state of collective action.

Action

As previously noted, action was instrumental in the creation of sense of community for all course groups through its use as a community determinant (with respect to cooperative activities, varied sub-groups of students, physical challenges and shared living activities). This section is concerned with how individuals in a class used their sense of community for the purposes of action. The specialization OE3 class was the only course that reached a stage of community development where full group action was attainable. This action was accomplished through development of two activities: a course "EcoSwan" and a Community Ecological Action Project.

Development of an ecoswan.

As previously noted, students in the specialization class were asked to sign a "SWAN, an oath or declaration describing a set of course values. The swan exercise provided students with an initial framework for respectful action to create their class community. Near the end of the course, students in the specialization class partook in an exercise to develop their own personal class "EcoSwan", a declaration of the class's ecological values. This was perceived as a serious activity as the ecoswan's details were to represent important ecological goals for all of the students in the community. Class consensus was necessary for an item to be included in the list. Creation of the ecoswan assisted in moving the class members as a group from a learning community to a learning community focused on action.

> The [original] swan gave us very specific points to focus on ... like a
>
> commonality. It was interesting starting with the swan and ending with
>
> the [eco]swan. Bringing the swans around. You are given a swan and
>
> then you develop your own. I like it. I think those were the most
>
> important aspects... (Interview #8, Kelly).

The nature of development of an ecological swan required a student class community that was focused and unified with individuals that were able to act for the greater community.

Community ecological action project.

Although for all classes, action seems to be an important contributor to the sense of community, for the specialization course, the students used the development of their community to create a form of group action. As previously noted, all students enrolled in ED 4284, the specialization OE3 course, were also enrolled in a course titled "Authentic Ecological Group Project". The purpose of this single semester course was for students to decide upon, then design, implement and evaluate a group ecological project. The specialization class decided to develop a one-day experiential ecological education program for children and adults. A program, called "EcoFest" was held at Old Fort William, a provincially funded historic site operated by the Ontario Ministry of Tourism, Culture and Recreation. Individuals who participated in EcoFest had the opportunity to take part in a variety of experiential and ecological lessons and activities such as low impact wilderness travel, maple sugaring and vermicomposting. The specialization students needed to act together to develop educational programs, fundraise, market their event and organize transportation to the site.

Regularly scheduled student organization meetings were held prior to the project. Meetings were governed through the use of a "rotating facilitator", whereby a different student coordinated the session each week. During the meetings, sub-groups reported to the class, people made recommendations concerning the event's progress and the class body voted on issues that arose (such as bus versus car transportation). Approximately twelve one-hour meetings were held at the university prior to the event. Students also organized three "pot-luck" supper meetings at selected houses to discuss specific aspects of the authentic group project.

Students remarked that the authentic group project provided a sense of community growth. "As we developed community, pairs, then larger groups converged to come to a final goal. Ultimately the last group project would only be possible if a total community sense is achieved" (PS7, 4284, p.2).

I noticed a change too, I guess as we got into the group authentic project, where people actually started bitching about other people ... When we first all came together we didn't know each other at all ... People would get this welling up of emotion, I guess, because they are comfortable enough with everybody. They just let it all out ... I think that helps to jell everybody more ... I liked how people were maybe not initially, but eventually willing to try new things (Interview #8, Kelly).

Moreover, it appears the authentic group ecological project provided a forum for action within the community. Students used the common theme of ecology and the creation of their own community to accomplish their set goal. "I think that this helped the community building process along in that it linked all the group members together as a common interest" (PS3, 4284, p.1). The focused effort on the group project had been noted as a component in the creation of community (PS1, 4284, p.1); however the community action of the group project also indicates that students in the class had moved from a superficial community to one that was able to deal with important issues and come together to actively tackle a large and intricate group project with minimal available resources and time.

The Relationship Between Community and Ecology

Overall there was an overwhelming response from individuals in all student groups emphasizing the importance of a sense of community and it's value to outdoor ecological learning experiences. Indeed, of the fifty-three survey respondents, only one did not feel that the creation of a sense of community was valuable to the development of ecological literacy; however that respondent did, in fact, note instances where community would be helpful. Thus, it appears that individuals in all classes were able to personalize their positive community experiences and seek applications of an ecological nature. "If we are to reconceptualize the way we think, treat, relate and be with the earth, we must do that within ourselves or else there is no harmony" (PS11, 4284, p.1). "Its very comfortable to know that others are working towards the same goals" (PS11, 4284, p.1). One respondent noted that development of community provides support and "strength in numbers [to] prevent feelings of isolation and helplessness in the face of large [ecological] problems" (PS11, 5634, p.1). Basically, all of the students involved in the project felt that sense of community was important for ecological learning situations. It is interesting to note, however, that there was a range of explanations regarding the significance of sense of community. Shared commitment and action were, again, prevalent themes when looking at student explanations of the relationship between ecological learning and community.

Shared Commitment

Feelings of shared commitment were based on student's perceptions of how their community (or the creation of their community) forged a personal relationship with the

ecological goals of the program. Many students from all course groups noticed there was a bond between sense of community and ecological literacy based on the idea of relationships and shared commitment. Ecological education "is seeking a compassionate caring relationship with all things not human that we dominate … the community aspect attempts to address the human side of things" (PS10, 4284, p.1). "It reflects the larger theme of all things being interconnected" (PS10, 4284, p.2). "In promoting connections with other people, some people feel a stronger connection, or caring, for the environment" (PS10, 4338, p.3).

Another important association to the theme of shared commitment was made by students who felt that creation of a community allows individuals to share beliefs and values, and trust one another to adequately address ecological issues. "If a sense of community is developed, the value is enormous. People learn how to interact with each other, learn different perspectives" (PS10, 4338, p.1). Indeed, development of a group's collective values and beliefs regarding ecological issues is an important goal of the OE3 program.

> A sense of community means that people are more comfortable sharing
> thoughts and ideas. This sharing may often lead to synergistic outcomes,
> where ideas are expanded and built upon to create bigger and better idea.
> Ecology teaches us that everything is connected to everything else. It is
> often discouraging when one tries to affect change around him/herself, but
> is alone. Having a community of people also working to affect change
> makes one's efforts seem worthwhile (PS10, 4338, p.3).

Action

Some students, mostly from the specialization class, indicated that a sense of community is important in terms of ecological action because it provides feelings of hope, support and rejuvenation for individuals. "Community instills hope in a field that can be defeating. We need hope, before we can do anything" (PS10, 4284, p.1). "It inspires the group to participate, share, trust and continue with the theme of OE3 for the rest of their lives" (PS10, 4284. p.2). Some felt that development of the community played a rejuvenating role with respect to ecological action. "Feeling comfortable and nurtured by a group of unique individuals from different places is a nice feeling" (PS10, 4284, p.2). Many students in the specialization class possessed significant ecological experiences prior to community development (IS2c, 4284, p.1-2). Therefore, formation and development of their class community was likely accelerated by student backgrounds as well as accompanying initial rejuvenating factors.

Community is Reflective of Ecology

It is interesting to note that in post-course surveys and interviews many students expressed feelings that the concept of community (or communities) is actually an ecological notion. Again, students from the specialization course (which had more time to build community as well as focus on ecological matters) noted that both ecology and community are based on relationships; and therefore, there is an inherent fundamental connection between the two concepts. "That's what ecology is, communities" (Interview #5, Mark).

There's just such an intrinsic relationship. I almost feel that the whole

purpose behind ecological literacy is to try to develop a compassionate

relationship with the non-human environment. To create a relationship

based on mutual trust and mutual satisfaction. Realistically we don't even

carry those relationships between each other. So how do we carry that

towards something we can't even visually relate to? That doesn't look

like me so why should I create a compassionate relationship with it if I

don't even want to create one with you, and you look like me. So, I think

that we need to be developing these relationships with ourselves in order

to be able to develop it with something that doesn't look like us. And then,

… I just think that the two are intrinsically related … there's no separation

between ecology and people (Interview #3 Sylvie).

Well, ecology to me is about everything being interconnected, so to me

community is just a natural part of that. Because, to me community is

about bringing people together and connecting people or you can look at

animal communities or whatever … all different parts of communities.

They are all about connections. So I think in order for globally, everyone

to have more ecological, more of a sense of ecology, or more ecological

literacy there has to be a coming together. So that means there has to be a

building of community. I mean, I just think it's an attitude, a mindset

thing where you are willing to view everyone as brothers and sisters. And

by doing that, you can work together to find some solutions (Interview #8,

Kelly).

If, in fact, ecology is based simply on communities and connections, perhaps the most fundamental and experiential educational methodology should include a "community of learners".

Summary

The themes of shared commitment and action were prevalent throughout the data collection process. A list of eight community determinants that fit into the categories of shared commitment and action were listed and examined. Community development in each of the three sample classes was explored. Studying individual and group levels of shared commitment as well as one class' action projects helped to determine the level of each class' sense of community. Finally, perceptions regarding the relationship between community and ecology are examined. Data collection supports a theoretical framework that explains the relationship linking sense of community and ecological literacy.

Chapter Five: Analysis and Conclusion

Introduction

The primary purpose of this chapter is to discuss the OE3 community, outline the conceptual framework linking sense of community and ecological literacy and present recommendations regarding ecological education. The concept of a distinct relationship between sense of community and ecology frequently occurs as a theme throughout the chapter.

The Building of Community

Rewards

Students entering into the OE3 program were not aware of the impact that the development of a community would have on their academic and personal lives. However, survey responses regarding the formation and benefits of community were overwhelmingly positive. Students from all class groups provided survey responses exhibiting the presence of membership, influence, integration and fulfillment of needs, and shared emotional connection (Chavis and McMillan, 1986). The development of a community serves to build trust, communication and teamwork skills, and full and active class participation with a commitment to the class' educational goals. Achievement of community leads to a more enriching learning experience for all. For students in the specialization class, the creation of community provided a sense of belonging and a culture of learning that emphasized work toward shared goals in a safe and positive learning environment (Manning and Saddlemire, 1996). Community, for the specialization class, was extended outside the classroom whereby positive social roles were developed based on common interests and values set forth from the OE3 program.

Moreover, participants in the building of community should be able to recognize opportunities for the growth of additional communities as well as act as catalysts in the development of new communities of ecological learning or other less formal community groups. The idea of community development not only promotes new communities but also effectively provides a foundation for advancement of interpersonal relationships, regional understanding, and ultimately, ecological literacy and beyond.

Community and Ecology

A sense of community development in educational settings can be exemplified as an experiential form of ecological education. Interconnection (Puk, 2002c), interrelationships (Roth, 1992) and deeper understandings (Capra, 1996) are widely considered as important components of ecological education. These three concepts are also vital in the formation of a community of learners. The eight determinants (cooperative activities, common purpose/goal, varied sub-groups of students, physical challenges, intimacy, shared living activities, focus on community, time) identified in the formation of the OE3 community promote ecological literacy in the sense that they encourage a shared commitment, interrelationships among all, and a deeper understanding.

A Conceptual Framework

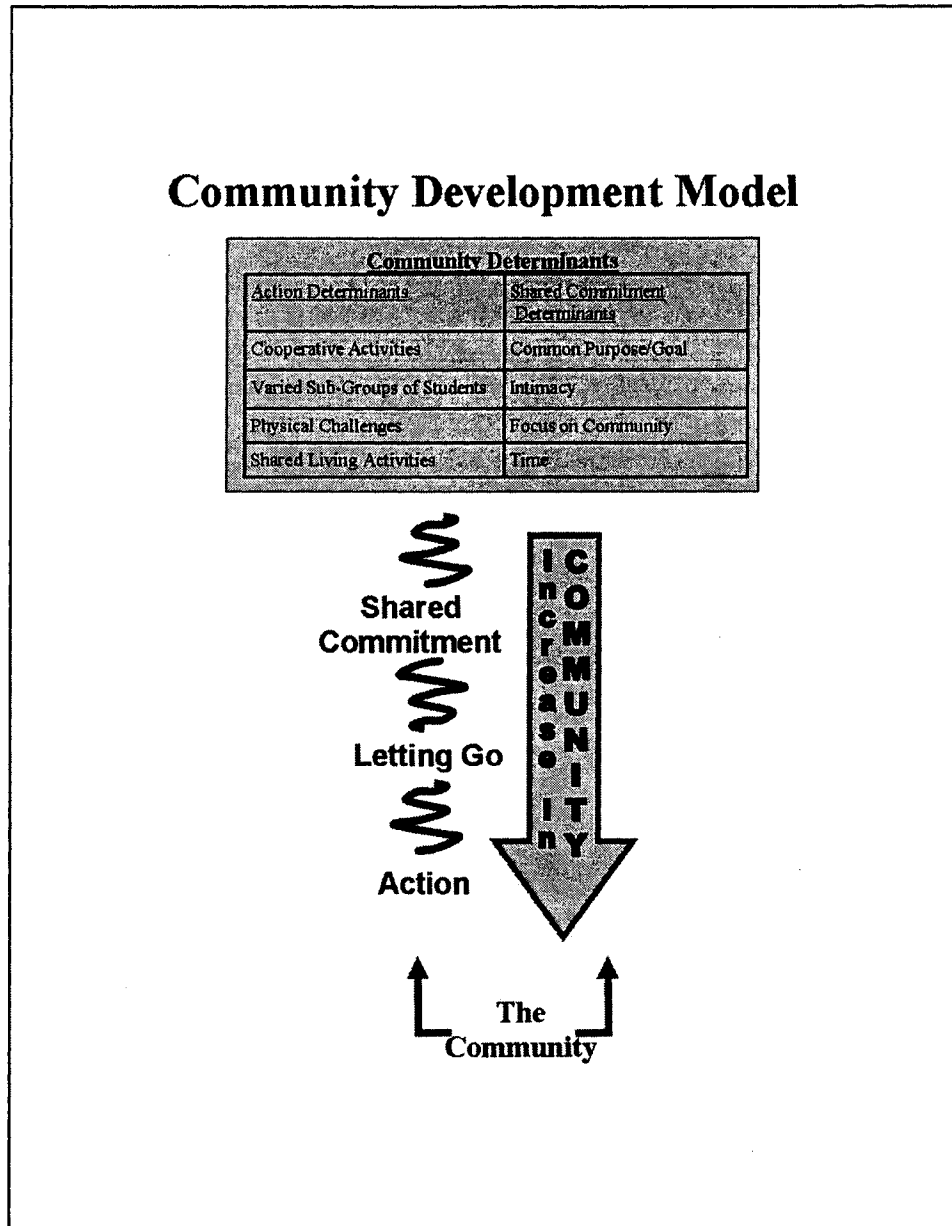The conceptual framework (see Figure 4) represents a comprehensive spatial analysis of the relationship between development of both sense of community and ecological literacy within the context of the OE3 program. As expected, the prevalent themes of shared commitment and action are widely represented within the framework. The framework is based on the concept of a similar progression of acquisition for both a

sense of community and ecological literacy. Another important characteristic involves the educational role of outdoor activities, experiential lessons and an ecological focus. These three components are integral to the philosophy of the OE3 program. As well, ecological literacy and the enhancement of community spirit can be patterned in a reciprocal fashion with respect to development of connections and reconnection/rejuvenation. The following four sections contain a full explanation of the conceptual framework as divided into the three primary sections of the framework itself: the community, the learning and the individual and development of ecological literacy. Each section contains a model explaining the component with respect to the overall conceptual framework.

The Community

The framework examines the idea of community as a group concept (see Figure 1). Community for the OE3 program was developed through the use of a series of determinants that were all essential in the initial formation and development for each class group. Cooperative activities, varied sub-groups of students, physical challenges and shared living activities can all be considered community determinants that are based on the principle of action. Indeed, all involve roles or activities where individuals are required to interact on a personal and educational level. This interaction encourages individuals to cultivate personal understanding, build trust, communicate and develop a culture of positive interactions among classmates. Action determinants were especially effective in the initiation and early development of a sense of community.

Figure 1: Community development model

Community Development Model

Community Determinants	
Action Determinants	Shared Commitment Determinants
Cooperative Activities	Common Purpose/Goal
Varied Sub-Groups of Students	Intimacy
Physical Challenges	Focus on Community
Shared Living Activities	Time

Shared Commitment

Letting Go

Action

Increasing COMMUNITY

The Community

Common purpose/goals, intimacy, a focus on community and time assist in the

formation of community by encouraging the formation of shared commitment. All four

shared commitment determinants are either based on or dependent on the creation of

commonalities among all group members. With the promotion of class commonalities,

individuals are able to assert a class and community commitment. As well, time serves

an additional purpose as it directly affects the community levels that student groups achieve. Class groups that spent the most time together reached the greatest development of community with respect to growth of shared commitment and ability to create effective group action.

For students in the OE3 program, community was developed through use of the stated determinants. Although students in all classes felt that a sense of community was present, it was noticed that the different class groups achieved different stages of community. Feelings of both shared commitment and autonomy were reached by many students in the various groups, although, a greater level of shared commitment within the community was achieved by the specialization class. This was exhibited by students' perceptions of autonomy within their class structure. Students in both the elective and masters groups did not reach an absolute stage of shared commitment.

From the stage of shared commitment, students in the specialization group were able to engage the group's energy to progress to a stage characterized by the ability to create community action. To reach this action stage, it was necessary for individuals in the class community to "let go" of their personal egos in order for the group action to proceed in a positive fashion. The concept of 'letting go' was demonstrated by students through the progression of the authentic group ecological project. For the specialization class, there was a great deal of controversy surrounding the decision making process for the authentic group project. The class was polarized over whether to create an ecological learning conference or develop a scholarship for local elementary students. The controversy lasted over three weeks before a decision was made. Many students expressed feelings of frustration. "That was a lot of intensive time together, and there
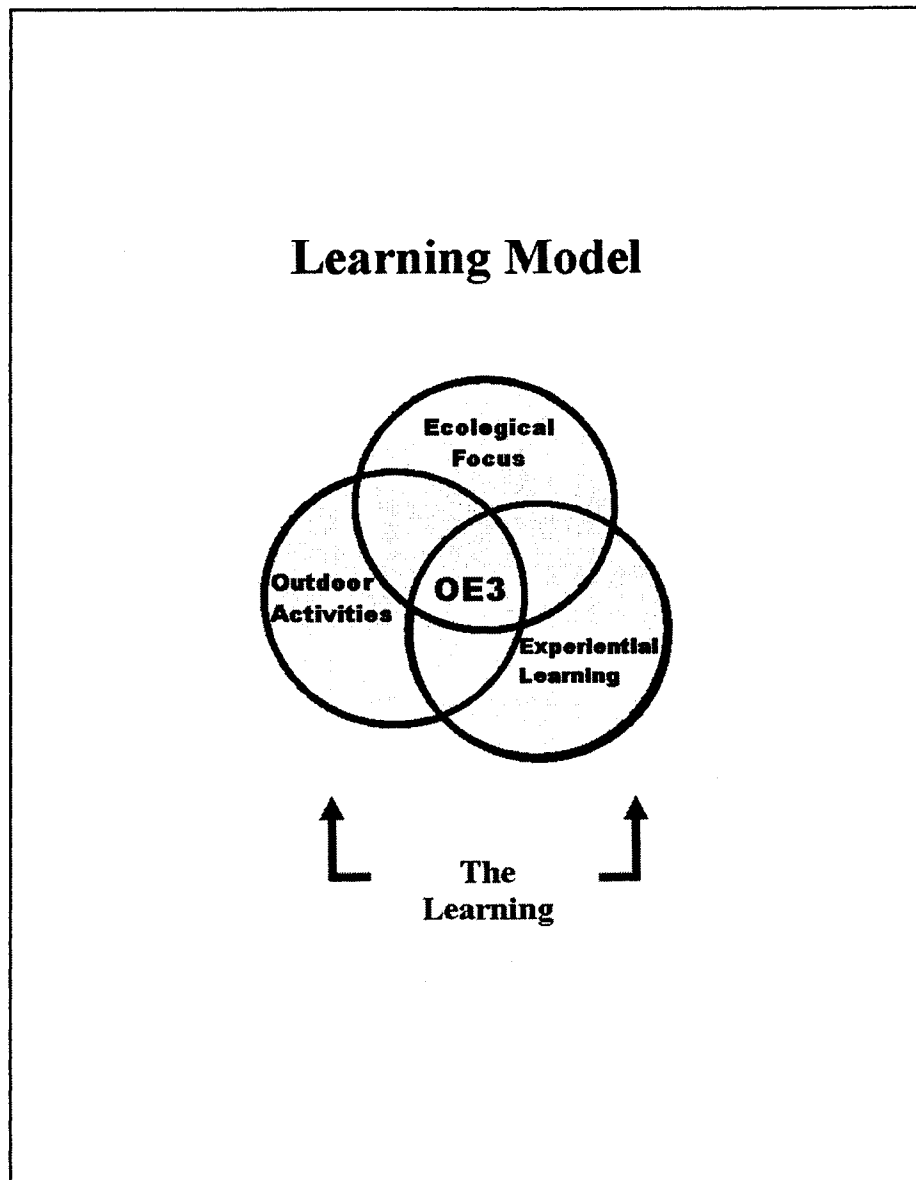
were people who were chomping at the bit all the time, like come on, lets get this thing going" (Interview #8, Kelly). However, after a decision was reached, the class community effectively and efficiently worked together to design and implement a successful environmental learning conference. Although it apparently wasn't easy for some members to "let go", once that was achieved it was possible for the class community to act quickly and efficiently as a collective.

This stage of action was demonstrated by the specialization class through the development of the authentic group ecological project. As well, specialization students worked together to design their own class "ecoswan", a declaration of how they would all act with respect and concern for the earth. For students in the OE3 program, the ability to act as a collective is the crowning stage in the development of class community.

The Learning

Three of the primary components of the OE3 program are an ecological focus, outdoor activities and the implementation of experiential learning. For all class groups, the three components were important for both development of community and the acquisition of ecological literacy (see Figure 2). Ecology and the development of ecological literacy are significant educational objectives within the OE3 program. Ecological education provides the primary focus for curriculum in the OE3 program. Activities are designed to provide education related to the boundaries of life on earth, the ecological functions of life and how they work, how these functions impact on each person and society as a whole and the changes each person and society as a whole need to undertake to protect these functions (Puk, 2002a).

Figure 2: The learning model

Topics related to functions and interconnections not only relate to ecology but also to

community development.

    The majority of OE3 course time takes place in the outdoors. Outdoor activities

are used for both building community and learning about specific environments. "The

outdoor learning environment allowed us to create a sense of community free of most

distractions of every day (community/city) living while at the same time allowing us (me)

to focus on nature exclusively" (PS6, 4338, p.2). "The outdoors brings people together in a positive way. I think as human beings we tend to get caught up in our indoor communities and forget about how much we can thrive and survive in the outdoors. I love it!" (PS6, 4338, p.2).

In the OE3 program, all of the course material is taught in an experiential manner. Teamwork and interaction with the environment is encouraged as the primary method of learning. Many cooperative and experiential activities are included in the immersion weekends. Immersion weekend activities focused on building community as well as providing the foundations of ecological education.

> Experiential learning is what allowed us to interact and get to know one
> another. From having challenges and goals to work towards, people were
> forced to draw on and expose a number of their skills, strengths, and
> weaknesses. This exposure was much greater than that seen in normal
> every day interactions accelerating the speed at which a sense of
> community was formed (PS5, 4338, p.2-3).

As well, students in the specialization class took part in, and were responsible for the development of a number of experiential lessons that depended upon exploration of regional and global ecological systems. Experiential lessons provided for an in depth, focused educational contact with the natural world. One survey comment explained, experiential "interaction with our environment and each other strengthened our sense of community" (PS5, 4284, p.2). "It gave us a place in this community, by doing it gave us a sense of belonging" (PS5, 4284, p.2).

The outdoor ecological and experiential program is outlined in the conceptual framework as three interwoven circles. This illustration denotes an approximately equal level of contribution from the three components interconnecting to become the OE3 program. Education, in the form of curriculum and instruction in the OE3 program is identified within the conceptual framework as the educational catalyst for both community building and the development of ecological literacy.

The Individual and Development of Ecological Literacy

Over time, the building of a community of learners focused within an academic theme of outdoor ecological experiential education enables individuals from that community to develop their own ecological literacy. As previously mentioned, Roth (1992) identified three levels of environmental literacy (appropriate to ecological literacy), nominal, functional and operational. Nominal refers to the acquisition of basic knowledge regarding ecological definitions and processes. Functional ecological literacy is explained as an understanding of the interactions between humans and the earth. Operational environmental literacy is a further progression beyond functional literacy. "Persons at the operational level routinely evaluate the impacts and consequences of actions, gathering and synthesizing pertinent information, choosing among alternatives, advocating action positions, and taking actions that work to sustain or enhance a healthy environment" (Roth, 1992, p.2). Furthermore, Roth (1992) identifies four strands (knowledge, skills, affect, and behavior) as important in the design and implementation of educational programs for environmental literacy.
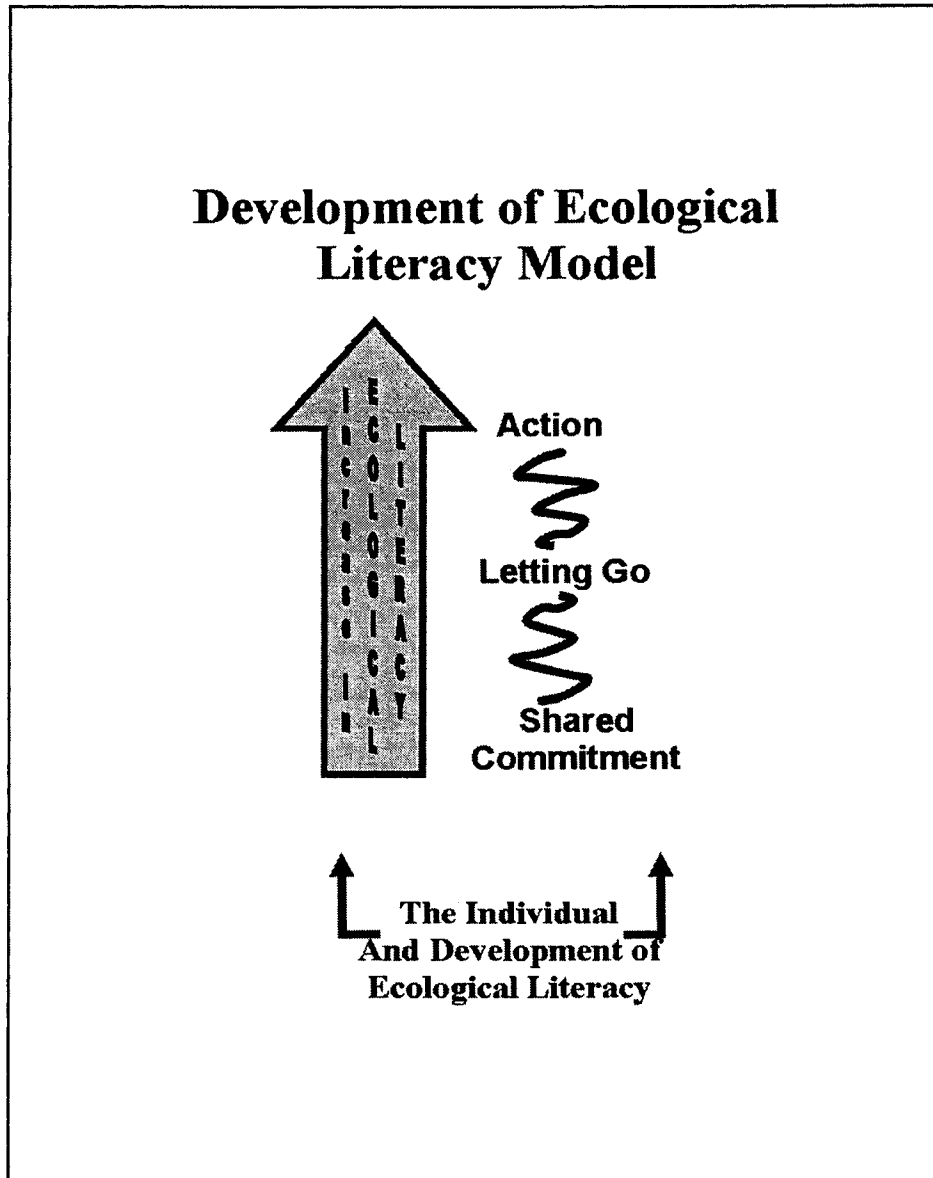
In a similar fashion, Stables (1998) discusses environmental literacy in terms of functional, cultural and critical literacy. Functional environmental literacy is based in

scientific knowledge as it involves concepts directly related to specific ecological

systems. Cultural environmental literacy enables us to explain natural systems within the

backdrop of human intervention, values and norms. Critical literacy allows for individual

action. Stables (1998) explains critical environmental literacy as,

> ... the ability to understand the text on a deeper and more creative level:
>
> the ability to discuss the use of genre in context, to question the motives
>
> and ideology of the text, and to explore and develop personal (and broader
>
> social) response to it. Critical environmental literacy must then imply the
>
> power to develop an understanding of the factors that contribute to
>
> environmental change and to have a view on how to further to oppose that
>
> change in a way which can be translated into action. (p. 160).

When looking at ecological literacy within the OE3 program, common themes of

shared commitment and action are integral components of that progression (see Figure 3).

Shared commitment can be explained as the advanced development and understanding of

the vested personal and ecological connections that allow an individual to form an

ecological "sense of place" both regionally and globally. The stage of shared

commitment is similar to Stables (1998) view of cultural literacy or Roth's (1992)

depiction of functional literacy (see Table 1). Within the OE3 program, specialization

students did enter the course with a moderate background of ecological knowledge (IS1b,

4284). This background places the students at a level similar to Stables' (1998)

functional literacy or Roth's (1992) level of nominal literacy. The stage of "action",

through ecological literacy, in the OE3 conceptual framework refers to how the

individual will use and translate ecological knowledge and skill gained with respect to

Figure 3: Development of ecological literacy model

**Development of Ecological
Literacy Model**

how they conduct their own lives. With development of the ecoswan, the specialization

class community created a framework of ecological action for each individual. This stage

of action signifies that students have "let go" of many preconceived cultural and personal

notions (for example, the concept of infinite economic growth as an important value)

related to negative ecological behaviours.

Table 1: A comparison of theories related to the acquisition of ecological literacy

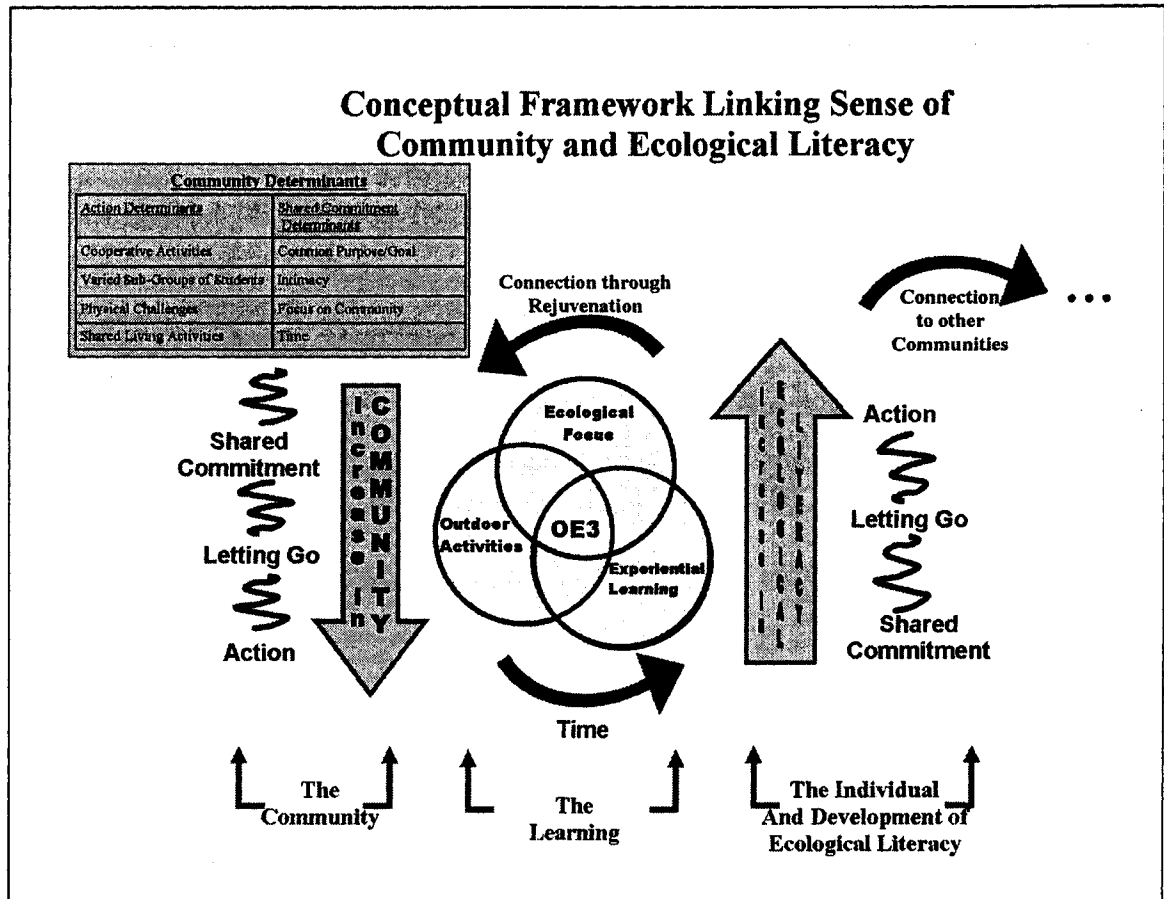| Development	Stables (1998)	Roth (1992)	OE3 Program (Puk, 2003)
Initial Stage	Functional	Nominal	Acquisition of basic knowledge, skills, and values.
Secondary Stage	Cultural	Functional	Shared Commitment
Culminating Stage	Critical	Operational	Action

Connections

It was noted through observation and survey responses that certain participants in the specialization class were instrumental to the development of a class community. As described in the complete conceptual framework (Figure 4), a few individuals who originally possessed personal vested interests in ecological values were rejuvenated through participation in the community. These specific individuals were also noted to have played integral roles in the formation of the OE3 community. Perhaps the rejuvenating factors present allowed these students to more easily connect and assist in the development of the OE3 community.

More generally, as a participant observer, one gets the belief that the experience of development of sense of community through the course helped students rejuvenate a lost faith that the earth can be protected for future generations. The formation of an ecological learning community may act as a rejuvenating factor.

It is assumed, although it is beyond the scope of this study, that individuals that are able to develop ecological literacy through the sense of community model may also find an ease of connection with other communities of a similar nature.

Figure 4: Conceptual framework linking a sense of community and ecological literacy

Recommendations for Ecological Education

Research

Further research regarding the effects of community development on ecological

literacy is necessary to provide for a comprehensive picture of the benefits of outdoor

ecological and experiential education in a variety of academic settings. Complete

understanding of the concepts and theories surrounding connections for individuals that

join educational groups based in the community model was beyond the scope of this

research project. An examination of the process of connection and possibly rejuvenation

through community and ecology could be of significant value to the field of ecological

education.

There is a need to examine the role of all levels of government in promoting education for ecological literacy. Removal of environmental science from the Ontario secondary school curriculum should serve as a political warning to all individuals concerned with future ecological protection that government policy regarding the environment needs to be investigated. Puk and Behm (2003) suggest, "Governments at various levels need to fund research into the best practices for teaching ecological literacy ... to determine what works best to create knowledgeable, active, and caring citizens" (p. 231).

Additional funding should be available for further research regarding ecological literacy; this includes the concept of community development as well as other practices for teaching.

Leadership

Although the instructor's leadership style was not significantly detailed in this thesis, the instructor and his style of leadership played an integral role in the development of a sense of community among all OE3 groups. The instructor demonstrated leadership based on a guided discovery approach. He set the foundation for activities and responsibilities and then allowed the student community to come together to learn and grow. "He guided us giving us simple rules and letting us figure things out, but he was still there if we needed him" (PS4, 4338, p.1). The instructor also taught the course in an experiential manner that implied students must interact with each other and the natural world to learn about ecology. Experiential education provided students with their own responsibility for learning; community development made possible a positive culture encouraging development of ecological literacy. The guided discovery approach to

creation of community and development of ecological literacy was shown to be very effective for students in the OE3 program. It may also be suitable for other learning groups, most specifically other university programs that educate for ecological literacy, integrated high school environmental learning programs or perhaps within Puk's (2002a) meta-discipline "Ecological Education" (Puk 2002a; Puk and Behm, 2003).

Curriculum

As community and ecology are fundamentally interconnected, ecological experiential education should always consider the development of community as a vital program component. Thus, school programs that educate for ecological literacy should follow a focused, sequenced curriculum that promotes and allows for the development of a sense of community. Puk (2002a) and Puk and Behm (2003) recommend that a new Meta-Discipline "Ecological Education" should be developed to create ecological literacy in both schools and through lifelong learning. The focus of this form of ecological education should remain on ecology rather that disjointed interactions with environment that characterize some present forms of environmental education (Jardine, LaGrange and Everest, 1998; Puk and Behm, 2001; Van Matre, 1999).

A majority of students felt that the cooperative activities were the primary method of class community development (PS2, 4284, 4338, 5634). This signifies the importance of experiential education as a significant community development tool. Experiential education is vital for any program educating for ecological literacy, as it is imperative for individuals to interact with natural systems to allow for deep personal ecological understandings.

Although this study focused on the impact of a sense of community on the development of ecological literacy, it can also be noted that ecological education is an excellent method of developing communities of learners. Perhaps an increased focus on successful, sequentially based ecological programs would assist in the development of positive school communities, in effect promoting a more pleasant and effective overall learning environment. Ecological literacy might serve as the focal point of a positive school culture.

Personal Reflections

As a graduate assistant, it was interesting yet challenging to observe and study each group's sense of community. Carrying out research as a participant observer made me keenly aware of my presence among the research participants. Although at times I would have much rather assumed a student role with the adjoining sense of community that I was recording, I feel incredibly fortunate to have taken part in such a positive and interesting research project. It was a true pleasure to spend eighth months with others so committed to learning about the natural world. Perhaps my greatest personal benefit was observing the nurturing and growth of three communities of learning whereby students developed trust, support, acceptance and communication skills.

For this study, qualitative methodologies of research, specifically grounded theory seemed most appropriate in developing a deeper understanding of the systems active in the lives of individuals as they progress from student to teacher. My greatest challenge dealt directly with this mode of research. Personally, it was difficult to maintain the patience to allow theory to emerge from the daily stream of participant observation.

In essence, I feel I have learned much more than simply the inherent relationship between ecological literacy and sense of community. The variety of methods to promote the creation of community provided for continual interest and learning opportunities. I, like many of the students, maintained a keen focus on what activities and concepts worked to create sense of community and a compassionate relationship among students. Many of the concepts will be useful in future educational endeavours.

I have further developed an awareness of the true benefits of experiential education. For me, the benefits involve opportunities for personal growth and ecological awareness through interactions with others and the natural world, as accompanied by a reflective process. This reflects the overall importance of ecological literacy in our every day lives. If we open our lives and minds to the systems around us we will always be growing.

Finally, the significance of our human innate desires to belong and be part of a community became readily apparent throughout the study. Development of a sense of community is something that humans, in general, crave. It provides a sense of safety, security and comfort. Sense of community provides the security that is integral to personal growth. Perhaps, the bond is instinctual, based on primal needs for humans to work together for survival. Perhaps, development of a sense of community can now work towards the ecosphere's survival.

Conclusion

In this thesis, the researcher has examined students in three Outdoor Ecological and Experiential Education classes of preservice students to study the nature of sense of community and its relationship with the acquisition of ecological literacy. Qualitative

research methods (grounded theory and constant comparative techniques) were used as the researcher collected information through participant observation, survey collection, and selected interviews. The research uncovered similarities and differences between the three classes to determine:

- determinants that assisted in the development of community,

- levels of sense of community developed by students in each class,

- the nature of sense of community development over time, and

- the effects of sense of community on the acquisition of ecological literacy.

Analysis of the gathered data led to the creation of a conceptual framework linking sense of community with ecological literacy. The framework has been divided into three components, the community, the learning and the individual and development of ecological literacy. Relationships among all components explained the overall connection experienced by the students in the study. The prevalent themes of shared commitment and action were well represented within the framework. Most importantly, action and shared commitment were observed as important stages for growth for both sense of community and ecological literacy. This indicated a significant conceptual linkage between both concepts. Indeed, some participants remarked that community and ecology were inherently related.

In conclusion, the findings reveal the significance of the development of a sense of community with respect to attainment of ecological literacy. Findings also highlight the inherent relationship between concepts of community and ecology and the overall importance of education for ecological literacy.

Ecological literacy should be viewed as being the first imperative in schooling and society. If we don't have clean water, air and soil, then jobs, family, trade and everything else, become redundant. Without a liveable ecosphere, all other priorities of life become moot. Love and concern for the environment is love and concern for all else. The school curriculum should be revamped in order to reflect these current realities (Puk and Behm, 2003).

Appendix A: Initial Survey Instrument   Community and Ecological Literacy

1. How would you define the concept of sense of community?

2. How would you describe your previous involvement with: (circle one)
 	
    a. experiential learning,
none very little   moderate   significant amount   a great deal
 	
    b. ecological education,
none very little   moderate   significant amount   a great deal
 	
    c. outdoor/adventure learning,
none very little   moderate   significant amount   a great deal
 	
    d. groups that successfully achieve a sense of community,
none very little   moderate   significant amount   a great deal

3. What do you feel is necessary for a group to develop sense of community?
4. What do you feel are the common traits of groups that posses a strong sense of community?
5. What expectations are you placing on yourself regarding your own role in the OE3 class?

Appendix B: Post-Course Survey Instrument   Community and Ecological Literacy

1. Do you feel a sense of community was attained in this course?

2. How do you feel this course achieved sense of community?

3. What role did course content, ie. ecological education, play in helping to develop sense of community?

4. What role did the instructor play in helping to develop sense of community?

5. How do you feel the experiential learning component contributed to the achievement of sense of community?

6. How do you feel the outdoor learning environment contributed to the achievement of sense of community

7. Over time, how did you see sense of community changing for the learning group?

8. What do you feel are the primary personal and group factors (such as age level, interests, physical abilities, personality traits, etc) that have affected the development of sense of community?

9. Can a formula be developed to educate for sense of community? (Can this formula be generalized to include other learning groups?)

10. What do you feel is the value of sense of community development in outdoor ecological education?

11. Do you see sense of community as valuable to outdoor ecological learning experiences?

12. Are there significant differences in instructor versus participant perceptions of overall group sense of community? If so, why?

Appendix C: The General Interview Guide Instrument (questions)

Group Characteristics

1. What do you see as the primary characteristics of outdoor ecological education groups that have attained sense of community? (role of personal risk, dialogue, support)
2. Over time, how do you see sense of community changing for the learning group? (Idea of a lifespan, end of school year)
3. What do you feel are the primary personal and group factors (such as age level, interests, physical abilities, personality traits, etc) that have affected the development of sense of community?

Development of Sense of Community

4. What do you feel are the primary components responsible for the formation of a sense of community in outdoor ecological education classes? (personal/group factors, role of the teacher)
5. Can a formula be developed to educate for sense of community? (Can this formula be generalized to include other learning groups?)

How Sense of Community affects Ecological Literacy

6. What do you feel is the value of sense of community development in outdoor ecological education?
7. How may the development of sense of community hinder outdoor ecological learning experiences?
8. Do you see sense of community as valuable to outdoor ecological learning experiences?

9. Are there significant differences in instructor versus participant perceptions of overall group sense of community? If so, why?

Appendix D: Letter of Consent

Dear Participants,

I am graduate student currently enrolled The Master of Education Program at Lakehead University. The Professor in acting as my thesis supervisor is Dr. Tom Puk. As one of the requirements for completion of my program, I am conducting a research study. I have elected to examine how sense of community in experiential learning situations contributes to the attainment of ecological literacy.

To collect data, I will, during the course year 2002-2003, observe and interview preservice teachers from three OE3 classes: ED 4338, ED 4284 and ED5634. I would like to invite you to participate in this study. Field observations will include notes detailing course activities, class participation, student interactions, and discussions related to environmental issues and ethics. An interview will be scheduled for the end of the semester. There will be a short written narrative component to the interview, in which preservice teachers will respond, in writing, to a simulated OE3 learning experience. The interview and written response will take approximately 45 minutes.

Participants will be granted anonymity during the reporting of the data. In accordance with university policy, all data will be stored for seven years following the study. Findings will be incorporated into a masters thesis and possibly a published project report.

Participation may allow individuals to further develop an awareness of the significance of sense of community in experiential, ecological learning situations. This, in turn, may provide participants with the knowledge and skills related to development of sense of community allowing further development as effective educators.

If you give your consent, it is important for you to understand the following:

- There are no risks involved to individuals participating in the study.
- You have the right to withdraw your consent at any time.
- Your anonymity and confidentiality will be protected.
- The data will be stored for seven years following completion of the research project.
- You will receive a summary of the project, upon request, following the completion of the project.

If you are willing to participate this research study, please sign the attached form. If you have any questions or concerns regarding the study, please contact Darrell Makin at 683-3266 or Dr. Tom Puk at Lakehead University at 343-8710.

Very sincerely,

Darrell Makin

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