The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal Knowledge with Respect to Science

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Abstract

The nexus that exists between Aboriginal ways of knowing and Western modern science provided the setting for this research project. It investigated the process of using digital film as a learning tool in the documentation and reflection of Aboriginal knowledge with respect to science. It used Participatory Action Research (PAR) as the research methodology, specifically students engaged in creating films on topics of their choice with respect to Aboriginal knowledge and science. The findings emerged into two themes; one focused on the traits of Aboriginal knowledge and its knowledge transfer systems; the other on the traits that encompass the use of digital film in the learning process, and the capacity development that accompanies it.

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PREFACE

Gila'kasla, nugwa'am Mupenkin, gayutlan lax Gwa'yasdams, gayutlan laxa Musgamgw Dzawada'neux. Greeting's, my name is John Lyall from the Coon Family of Gilford Island of the four tribes of the Musgamgw of the Kwakwaka'wakw (Kwakwala speaking peoples). Our family crest is the Kulus, a relation of the Thunderbird. I ground myself with these statements of identity, as my relationship with my surroundings starts from within. Nugwa'am means "I am" in Kwakwala. It is a word to introduce who we are and where we are from. As I have become more aware of who I am, of being Kwakwaka'wakw living in a modern world, I have developed a greater sense of my place in the world.

Indigenous knowledge sees awareness of oneself as the beginning of learning (Bouvier and Karlenzig, 2006). Consciousness is defined as awareness, an awakening (Kawagley, 1995). As I become more aware of who I am as a Kwakwaka'wakw person, I sense a developing personal consciousness. I know who I am, where I am from, and know of the origin stories of my ancestors. This has given me strength and the confidence to be in this world. I was not born with this confidence; I had a confused upbringing with my identity. I was certainly aware of it, my mother was proud, yet we were unsure of where we fit in. The scars of a chaotic past for our peoples were still too close.

A sense of awareness and learning of self has developed into a sense of responsibility. This has coincided and more likely been prompted by a developing relationship with my culture and environment, my progression as an Aboriginal teacher and the birth of my three daughters. I see the world differently now than I did just five years ago. This was a gradual change for me; I did not awake one day seeing everything differently. I noticed this at a summer 2004 University of Victoria three-day course on Qualitative Analysis. As we pondered questions such as *what is knowledge?*

And how do we transfer knowledge? I immediately recognized that my answers were very different from my classmates. My answers focused on how knowledge transfer is a critical and necessary step for the continued existence of our people. We as learners have the social responsibility to accept our teachings and transfer these to our children, and that this transfer and retention of our Aboriginal knowledge to our children and children yet unborn is the essence of our very survival.

My time as a teacher within our communities has coincided with a personal stronger relationship with self, with being Kwakwaka'wakw. I have been teaching since the fall of 1999, the majority of which has been with Aboriginal students and programs. My first two years were spent teaching in Kingcome Inlet in a K-10 school. The following were in Victoria, six years as the teacher-coordinator in a program entitled, the First Nations Graduation Program (FNGP) in the Sooke School District. I am currently (2009) a Vice – Principal at Spencer Middle school in the Sooke School District. I have been a graduate student in the Aboriginal science research project since the summer of 2004.

In the spring of 2002, while conducting community research into First Nation educational programs throughout the city, I met Dr. Ted Riecken of UVic working with the First Nations Leadership class at Esquimalt Secondary school. Dr. Riecken and his graduate assistant were working on a project entitled the Traditional Pathways to Health (TPTH), a research project that investigated the use of digital films to research questions on health and wellness with respect to Aboriginal youth. This off chance encounter formed a budding relationship between Dr. Riecken and his TPTH team and the FNGP that resulted in a three year partnership producing many student films, the intellectual and physical capacity for continued digital films production and the starting point for this research project.

I have found the use of digital film a positive learning tool in addressing the questions of health and wellness. Of particular interest was the recurring theme of local Aboriginal knowledge or cultural practices (such as singing, drumming or participating in healing circles), and how this kept our Aboriginal youth healthy and well. It seemed a natural and innovative step to bring the medium of digital film to the nexus of Aboriginal knowledge and western science.

It is the responsibility of transferring knowledge that will guide my involvement in the Aboriginal Science Education Research project, initiated by the Aboriginal Enhancements Branch of the British Columbia Ministry of Education. I have seen the twinkle in our students' eyes when engaged in learning relevant to them. It is that twinkle that will guide me through the daunting and exciting task of Aboriginal science research.

CHAPTER ONE

Research Design

The fundamental design of the research project *The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal Knowledge with Respect to Science* was student participants creating films with respect to Aboriginal knowledge and science. Participatory Action Research (PAR) guided the students as they investigated this exciting nexus of knowledge.

Rationale

Statistics present a bleak picture for Aboriginal student participation in BC schools. In their annual report, *How are we Doing* (2005), the BC Ministry of Education reports Aboriginal participation rates in courses Biology 11-12, Chemistry 11-12 and Physics 11-12 in the 5 - 40% range. However, these reports also clearly demonstrate that students who do participate generally succeed. The report continues that Aboriginal students entering grade 8 are graduating at a rate of 47% in 6 years (BC Ministry of Education, 2008). Subsequently, Aboriginal students are not entering post secondary institutions in large numbers, only 34 out of 3800 First Nation graduates from the class of 2002 entered University the following year (Lorna Williams, personal communication, EDCI, University of Victoria, July 2004). Of Aboriginal students in post-secondary, only 3.2% of the 27,000 Aboriginal students enrolled in science programs (Berkowitz, 2001).

Across the country, Aboriginal students face an increased number of social factors that contribute to their lower participation rates in school and university, including poorer health standards, single parent families, housing needs and the lingering effects of the residential school system (Johnson, 2004). Aboriginal students in the Sooke School District reflect this national picture. The BC Ministry of Education reported graduation rates in the Sooke School District for

Aboriginal males at slightly greater than 45%, while Aboriginal females were as low as 30% (BC Ministry of Education, 2005).

As an Aboriginal educator, I am aware of and celebrate specific and personal success stories. However, it is clear that on the whole, Aboriginal students are not participating and thus not succeeding in BC schools or post-secondary institutions. It is the above statistics that provide the rationale, in part for this research project.

It is important for our Aboriginal youth to participate and succeed in science for many reasons. Science education has been promoted by the Science Council of Canada (1991) as a critical aspect of every student's education. It contributes to intellectual growth, facilitates informed decision making, provides a foundation for further scientific and technological growth, and prepares students for employment in an increasingly technological world. Physicist Art Hobson echoes these sentiments through "without a scientifically literate population, the outlook for a better world is not promising" (Hobson, 2003, p. 111). In her paper, *Why Aboriginal Students are not taking Science*, Mullens (2001) mirrors these conclusions and states:

> Science should be a critical aspect of every Canadian student's education. For educators and society to be unconcerned that almost an entire population of people, for whatever reason, is alienated from this form of intellectual development, is simple morally wrong (Mullens, 2001, p. 154).

The need for science education amongst our Aboriginal peoples has never been greater for the technical literacy and skill required to bring about self determination in band resource management, health and economic development (MacIvor, 1995). Many bands are small communities living in isolation and they do not have the personal or monetary resources to address the economic and environmental troubles that face them. An example is my home community, the Kwicksutaineuk band on Gilford Island. Forestry practices have contaminated their well system,

leaving no drinking water. Strict Department of Fisheries regulations have limited their access to traditional resources such as clams and halibuts, and most recently, a plight of fish farms has encroached on their traditional territories, importing unknown environmental damage while the profits are exported.

A look at the present science education system and its failing with respect to our relationship with our environment finds:

> If today is a typical day on the planet Earth, we will lose 116 square miles of rainforest, or about an acre a second. We will lose another 72 square miles to encroaching deserts… we will lose 40 – 100 species… today the human population will increase by 250,000, and today, we will add 2700 human chlorofluorocarbons and 15 million tons of carbon to the atmosphere (Orr, 1993, p. 7).

These are staggering statistics, and surely provide the impetus and motivation for change. The world is not whispering to us, it is has been screaming to us for the past two hundred years (Crease, 1992). Orr notes that our present world is not the work of ignorant people; rather it is the work of university graduates, the work of our brightest people (Orr, 1993). Orr concludes that all education is environmental education. Snively furthers this by linking First Nations and Environmental education as two inseparable disciplines, stating "you cannot talk about one without talking of the other" (Gloria Snively, personal communication, EDCI, University of Victoria, July 2004).

One of the goals of the Aboriginal Science Education Research project is the integration of Aboriginal knowledge into the science curricula. Schools, colleges and universities base their scientific programs in Western Modern Science (WMS). Our students exist in an educational model that tells them that their language, their traditional knowledge is not valid, that western methods are the solution (Snively, 1995). Traditionally, this can be linked to assimilation policies,

that Aboriginal youth not succeeding in Western educational models was further proof that assimilation was the answer. If we turned this around and validated Aboriginal knowledge through curriculum integration, we may tackle the important point of relevance. Snively (1995) promotes the approach of a broader perspective in our educational system, to incorporate Aboriginal contributions and knowledge. A harmonious mutual relationship with our natural surroundings and knowledge of how to maintain this relationship is of the utmost importance (Cajete, 1999). It is imperative that our science education program changes in order to face these challenges.

Incorporating Aboriginal knowledge into our education system would present relevant and meaningful curriculum for our students. Significant learning is directly related to the perceived personal relevance of the material presented (Cajete, 1999). This learning may directly apply to Aboriginal educational concepts of knowledge transfer. Knowledge transfer is a new name for a concept that is essential to who we are as Aboriginal peoples. Oral histories determined that knowledge must be transferred from generation to generation. It is because of the transfer of knowledge by our ancestors that we will continue to exist. It is our responsibility as a people to honor our ancestors, to acknowledge their sufferings and pass on this knowledge to our children.

Purpose of Research

This research project is one of several case studies comprising the Aboriginal Science Research Project. The Aboriginal Science Project is a collaborative venture between the Aboriginal Enhancement Branch of the Ministry of Education and the University of Victoria to address the under-representation of Aboriginal students in science classes in British Columbia, and the under-representation of Aboriginal people in science related careers. The main purpose of the

Aboriginal Science Research project is to determine why this is so, and to find ways to significantly improve their participation and achievement in science. The results of this larger study will be used to inform the Ministry, superintendents and parents with important information; and to guide teachers, curriculum developers, and program planners to develop culturally sensitive learning experiences (Snively, Williams, 2006). Snively and Williams recently published a concise description of the project, its history and vision entitled "The Aboriginal knowledge and Science Education Research Project" in the *Canadian Journal of Native Education* (Snively, Williams, 2006).

This research, *The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal Knowledge with Respect to Science* is encased within the larger Aboriginal knowledge and Science Education Research Project. It investigated the process of using digital film as a learning tool in the documentation and reflection of Aboriginal knowledge with respect to science. Student participants created films with respect to Aboriginal knowledge and science as a learning tool in their science class.

The purpose of my research investigated whether using digital film in the documentation and reflection of Aboriginal knowledge with respect to science was a positive learning tool. In conjunction with the other research projects within the larger Aboriginal knowledge and Science Education Research Project, I anticipated that it anticipated to add to the understanding and aid in providing an impetus for positive change in addressing Aboriginal knowledge and Science education in British Columbia's schools.

Research Questions

The intention and purpose of this research investigated how the use of digital video contributed to:

- Developing a positive learning environment in the science classroom
- Reflecting and documenting Aboriginal knowledge
- Developing students' understanding of Aboriginal knowledge
- Development of students' research, leadership and technological capacities
- A developed sense of pride and self efficacy in the accomplishment of film
- Development of a bridge of understanding between Aboriginal and Western Modern Science worldviews

Specifically, this research project attempted to answer the following questions:

1. What are local examples of Aboriginal knowledge as it relates to science?
2. What are students' understandings of and experiences of science as instructed in school?
    a) In what ways do those understandings change after being involved in the video project?
3. What are students' understandings of and experiences of Aboriginal knowledge?
    a) In what ways do those understandings change after being involved in the video project?
4. What are students' perceptions of using video as a tool for learning Aboriginal knowledge?
5. In what ways do students use video as a tool for transferring Aboriginal knowledge?
6. What are students' perceptions of using Participatory Action Research (PAR) methodologies as an effective learning tool?
    a) In what ways were student capacities enhanced through the involvement in a PAR based project focusing on Aboriginal knowledge and science?

Ownership

The production of digital videos on Aboriginal knowledge and science requires a discussion on the concept of ownership. Riecken (2006) recognized that the capturing of Aboriginal knowledge on film immediately brought the ownership question to the forefront. Thus, it had to be very clear to the researcher, student researcher and community participants on the concept of ownership. The intention of this research project with respect to ownership was that the digital films created by the students would be owned by the students. The knowledge would stay within the community to disseminate as they see appropriate. Films to be shown publicly were done so with the students expressed consent. "This approach to ownership control and access represents a blending of the interests of the academic, knowledge protection and transfer, with the interests of the students as members of their Aboriginal community, protection, preservation, and control of Aboriginal knowledge" (Riecken, 2006, p. 271).

Limitations

There were several limitations that faced this research project. I will break these into three themes: the systemic challenges facing Aboriginal education, the limitations of research within Aboriginal communities, and the specific limitations of this research project itself.

This research project investigated a model of instruction (using digital video) for Aboriginal knowledge within the science program that was framed within the bigger picture of Aboriginal education. The systemic challenges facing Aboriginal education in today's public school system are immense and beyond the scope of this research project, yet the key point is that the limitations of this research project were encapsulated within the greater limitations of the current plight of Aboriginal education. My experience within Aboriginal education has garnered common themes

that the community would like to see: more Aboriginal teachers, Aboriginal language and culture curricula, a welcoming and understanding environment, and healthier relationships or understanding between schools, teachers and local Aboriginal communities and their students. How to integrate and implement these themes in a respectful manner is the underlying challenge.

A recent challenge facing Aboriginal education is the recent push for more 'accountability' in the public school system through the introduction (or re-introduction) of standardized exams (Bouvier and Karlenzig, 2006). The 2004 graduation program is now a three year 80 credit plan with standardized provincial exams that are requirements in Language Arts 10 and 12, Science 10, Social Studies 11 or BC First Nation Studies 12, and Mathematics 10 (BC Ministry of Education, 2006). This model moves us towards defining student success in narrow terms that ranks and categorizes individuals; counter to the values of Aboriginal cultures (Bouvier and Karlenzig, 2006). There are enormous challenges facing Aboriginal education that are furthered by the re-introduction of standardized exams that disregard Aboriginal knowledge.

The subject matter, Aboriginal knowledge and science itself presented a challenging subject for high school students to discern. This may have been the first time that Aboriginal students, particularly in a diverse urban setting such as Sooke school district, were introduced to terms such as Aboriginal knowledge or worldview, or asked to even consider that Aboriginal knowledge is valid in a school setting.

Beyond the plight of Aboriginal education, and the issue of introducing Aboriginal knowledge into that system, a limitation arose at the current state of severely diminished Aboriginal languages. There is currently an epidemic situation facing Aboriginal languages across North America. These include the following frightening statistics:

- 80% of North American native languages are moribund,

- Over the next century, 2 languages will die each month,
- A quarter of the world's languages are spoken by fewer than 1000 people (each),
- Over 90% of the world's languages may be extinct in the next century (Cantoni, 1996).

This is a significant challenge for numerous factors. Drawing upon my own heritage, Kwakwaka'wakw literally translates to Kwakwala speaking peoples. The language is not a part of us as a people. It is who we are as a people. Knowledge is embedded into language. Our way of viewing the world, comprehending and communicating are expressed in our language. Additionally, the conservation of language promotes a sense of place amongst peoples. Thus, the dire situation facing our language directly affects the ability of a people to document and reflect Aboriginal knowledge.

There are also considerable challenges on the topic of research and Aboriginal communities. The question of ownership of knowledge is a particularly challenging aspect of the proposed research. "Because knowledge carries power to do good or ill will, many elders decline to have their knowledge recorded in writing or electronic media" (Castellano, 2004, p.104). The negative perception of researchers amongst Aboriginal communities is directly related to the ownership question. There is a perception amongst Aboriginal communities that "we have been researched to death" (Castellano, 2004, p. 104). Deloria (1991) furthers that researchers derive all the benefits while bearing no responsibility for the use of their findings, that this relationship is not reciprocal.

Participatory Action Research (PAR) is meant to address these questions of ownership through direct participant involvement in the research. However, PAR itself has many challenges it must face. Dickson and Green (2001) report a number of tensions beyond ownership and negative perceptions of researchers including: the capacity of participants to be co-researchers and engage in critical analysis, and balancing the self reliance of the participants onto the principal researchers.

Colorado (1988) furthers by asking whether PAR forces Aboriginal peoples to conduct research based on Western scientific methods which may be to the detriment of their Aboriginal worldviews.

The specific limitations of this research project itself included the challenges of a new form of technology as a research tool, the use of PAR as a teaching tool and the consideration that the principal researcher (myself) was also the teacher and curriculum developer.

The first challenge faced by using digital video as a research tool is exactly that, the use of a digital video camera. Many of our elders and community members are wary of being recorded digitally. The digital camcorder is an obtrusive beast to many of our elders, who are reluctant to be recorded for infinitum on film. Thus, the advantage of using current technology will also present a challenge. The general public; in particular, our elders will be wary of that technology. Above the reluctance of people to be recorded on tape is the consideration that our cultures have traditionally have been oral cultures. It was the responsibility of our learners to pay attention, to learn and to remember. Hence, elders may see the electronic recording of their teachings as counter to the traditions of our teachings.

The use of PAR research methodologies also presented challenges in the classroom. The concept of researching what you want to research and studying what you want to study seems simple in its concept. However, it is much more straightforward to assign a student a topic and instruct them to write upon that given subject, than to hand them a blank piece of paper, instructing them to write upon what 'interests them'. This is certainly not a challenge that cannot be overcome, but it is present. Students become programmed through their schooling to do their assignments and projects as instructed, adhering to subject criteria. The challenge was to rekindle the sense of urgency and ownership within our students.

Fundamental with PAR methodologies is the voluntary participation of the student participants. As principal researcher and also the teacher, there may have been a perception that some students were coerced into participating by the dual roles that I adopted. I strove to address this challenge through my experiences with the Traditional Pathways to Health (TPTH) research project. The First Nations Graduation Program (FNGP) has partnered with University of Victoria researchers and our Aboriginal students in producing digital videos on themes of health and wellness. This project had achieved considerable successes by placing PAR methodologies into what was an elective and student centered classroom.

In addition to the perception of coercion, there existed the perception of bias as the principal researcher is also the teacher. This indeed did provide a challenging aspect of the research project, one which I will address in chapter three on methodology.

Thus, there are considerable challenges facing Aboriginal education and as a consequence, any project situated within it, as well as this specific research project itself. However, our histories as a people are strife with challenges and we are still here, and will always be here as Aboriginal peoples. This resolute responsibility to our ancestors, coupled with optimism shall provide the direction through the challenges.

Significance

There are a number of significant outcomes associated with *The Use of Digital Video as a Learning Tool for Reflecting and Documenting Aboriginal Knowledge Project.* Indeed, it is the positive and empowering process of producing digital videos on Aboriginal knowledge which attracted me to the project initially. It is anticipated that the project may increase students' personal capacities, address the current situation amongst Aboriginal students and science

education, be a tool for retention and transfer of Aboriginal knowledge, and act as a bridge between worldviews of Aboriginal and Western science.

The significance for students' capacity building is inherent throughout the project, and is a key fundamental of the PAR methodologies used throughout. It was anticipated that the students would benefit through the production of the films through:

- the development of leadership skills and research expertise through participation in conducting research,
- the development of capacities in the use of digital video technologies as tools for organizing and presenting information on the subject matter of Aboriginal knowledge and science as it relates to First Nations youth and their communities,
- the development of an understanding of the manner in which PAR can be used to develop school and community based initiatives for promotion of knowledge retention and transfer,
- A developed sense of pride and self efficacy in the accomplishment of film.

Introduced in the rationale were numerous significant reasons why is it important for our Aboriginal youth to participate and succeed in science. To summarize, these include: addressing the environmental predicament our Earth currently is in; addressing the social, environmental and economic plight our communities are in; and the need for educated and trained people to cope with this; and the fundamental fact that science education is of critical importance for all people.

It is anticipated that this research project may facilitate and address Aboriginal knowledge incorporation and student participation in science through: allowing our students an avenue to express their personal stories with respect to Aboriginal knowledge; provide intrinsic motivation to the students from the use of technology in learning; increase the relevance of learning by incorporating Aboriginal knowledge into the science classroom; re-invigorate a traditional learning

model by formalizing relationships between students and elders; and the formation of a cultural archive of knowledge which may have significant effects on the transfer of Aboriginal knowledge.

It was hoped that a complementary worldview, presented through the lens of Aboriginal knowledge and Western modern science would provide a more balanced, sustainable view of our world and our relationship with it. The use of digital video through the paradigm of PAR methodologies provided a beneficial tool in this incorporation. As this project was one of several associated with the Ministry of Education's Aboriginal knowledge and Science Education Research Project, it was anticipated that it may act as model and inspiration for Aboriginal knowledge and Science projects throughout the province.

CHAPTER TWO: LITERATURE REVIEW

The review of related literature will focus on the following five themes: Aboriginal knowledge and Western modern science; science education; sense of place / identity; participatory action research; and the use of digital film as a learning tool.

Aboriginal Knowledge and Western Modern Science

A review of related literature presents the challenging aspect of defining the two disciplines of Aboriginal knowledge (AK) and Western modern science (WMS). A fundamental principle of qualitative research is the involvement of the researcher in the process, that it is impossible to be completely objective. As such, as an Aboriginal educator with a background in WMS (B.Sc. in Physics), I will present a review of related literature on definitions of AK and WMS as they relate to me. This will begin with the concept of a worldview.

Kawagley defines a worldview as the special lenses ground by our ancestors that determine how we view the world (Kawagley, 1995). It is the invisible set of rules, behaviors and experiences that help us understand how the world works (Campbell, Menzies, and Peacock, 2003).

WMS can trace its origins to the early 17th century that was led by scientists and philosophers such as Newton and Descartes. Newtonian mechanics were able to successfully predict orbital periods of astronomical objects such as planets or comets. This was a very empowering process that allowed human intellect to replace prophecy by scientific prediction (Kounosu, 1986). Kounosu (1986) furthers that western science liberated European minds from the fear of the unknown and nature and thus placed humans at the highest level in a hierarchy of nature.

The worldview of WMS is often guided by the process known as the scientific method. The scientific method is generally agreed to have four principle steps: observation, formulation of

hypothesis, testing of hypothesis and conclusion or analysis of the test (Lederman, 2002). This method would allow one to observe the mass of an astronomical object such as a planet (through its gravitational interactions with other astronomical objects), formulate a equation to predict the orbit of the planet, test the validity of the hypothesis, and reach conclusions on the validity of the hypothesis. A principle of the scientific method is a belief in the complete objectivity of the scientists conducting the experiments or formulating the hypothesis that is intended to produce value free, universally applicable scientific knowledge (Hayward, 1984). It is the scientific method that is referred as the 'nature of science' that is the WMS' worldview (Doyle, 1985; Lederman, 2002).

It should be noted that the nature of science and its philosophies and worldviews are beyond the scope and reach of this paper. Indeed, the nature of science within WMS is one of intense philosophical debate amongst the WMS community. The method presented here is one of "positivism". Inherent within the underlying principle of the paradigm of positivism is that there is a truth out there that is waiting to be discovered or understood by humankind. A fundamental belief of the scientific method is, if followed explicitly, all mysteries of nature can be solved or discovered (Cajete, 1999; Hayward, 1984).

In its efforts to understand nature, WMS breaks down and classifies knowledge into discrete disciplines such as Physics and Chemistry. In this classification of scientific knowledge, volumes of knowledge are stored in textbooks that are prevalent with science instruction in BC schools.

Aboriginal knowledge (AK) has been defined as "an ancient, communal, holistic and spiritual knowledge that encompasses every aspect of our existence" (Brascoupe and Mann, 1999, p. 4). AK is specific to each nation and their natural adoption to their natural environment. There exists no word for science in any North American Aboriginal language. However, if science is an

interaction with and understanding of our natural surroundings, it is evident that every culture has its own science, an Indigenous science (Cajete, 1999; Ogawa, 1995; Snively and Corsiglia, 2001).

While WMS tends to break down and classify areas of knowledge, AK is holistic, integrating their scientific processes within whole bodies of knowledge. WMS rejects the claim that Aboriginal knowledge is science, claiming oral histories are illiterate, and that quantitative methods are the only way (Cajete, 1999; Peat, 1996). AK is transferred orally through the generations through storytelling, song and dance. AK teachings are value laden of maintaining a positive reciprocal relationship with the self, family, community and the natural surroundings (Brascoupe and Mann, 1999; Snively 1995).

Oscar Kawagley (1995) presents three concepts that have characteristics of AK: consciousness, morphology and self-discipline. The consciousness is our awareness of ourselves and relationship with our environment, morphology is our invisible connection to our ancestors and ancestral homelands, and self discipline is the trait of showing gentleness and respect to all things around us.

A commonly used term to define AK is the term Traditional ecological knowledge (TEK). It is defined as "a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations of cultural transmission, about the relationship of living things (including humans) with one another and with their environment" (Berkes, 1999, p. 8). For the purposes of this proposed research project, I will continue to use the term Aboriginal (AK) in place of the perhaps more commonly used term, TEK. While TEK is an extremely important discipline, I consider it to be a component of AK.

Spirituality is a divergent point for WMS and AK. "For centuries, philosophers have debated the existence of a spiritual world; in Aboriginal culture, there is no debate, the spiritual and physical

worlds both exist, and it is in the former that our creative insights originate" (Dyck, 1996, p. 97). Spirituality is a base of Aboriginal knowledge. Hampton states that "the first standard of Indian education is spirituality, at its center is respect, for the spiritual relationships that exist between all living things" (Hampton, 1998, p.42). That AK bases its teaching with spirituality has been a factor in its discredit by Western scholars deeming it primitive and heathen (Deloria, 1973; Walker, 2001).

An example of spirituality in Aboriginal ways of knowing is the term 'Aweena'kola". Aweena'kola in Kwakwala translates in harmony with nature. It illustrates our spiritual and deep connection to our natural environment. At a funeral in Kingcome Inlet, one of our chiefs, Bobby Joseph stated that the deceased elder and our people, the Kwakwaka'wakw, are as much a part of this valley as the trees, river and mountains, that we are aweena'kola. (Bobby Joseph, personal communication, Kingcome Inlet, March, 2000).

The Medicine Wheel, a starting point for many Aboriginal philosophies has the Emotional, Physical, Mental and Spiritual as the four aspects of the human. These four aspects are encased within a circle, symbolic of the interconnectedness of Aboriginal ways of knowing. The colors of the medicine are representative of the four races of the world: white for Caucasian, black for African, red for Aboriginal and yellow for Asian. Four is the base number, a special number for Aboriginal peoples; there are four seasons, four directions, four posts in our bighouse, four times a dancer must circle the fire. The teachings encompassed within the Medicine Wheel are a symbolic guide for Aboriginal ways of knowing.

The Aboriginal Learning Knowledge Centre (Aboriginal Learning Knowledge Centre, 2009), coordinated by respected Aboriginal scholar Marie Battiste has developed learning models of Aboriginal learning. The First Nations holistic lifelong learning model explicitly lays out the many aspects of Aboriginal lifelong learning. The lifelong learning models are a comprehensive look at

Aboriginal learning and hence knowledge. It uses a tree as its model, starting with the learning rings of individuals, western and Indigenous knowledge encompassed inside the four aspects of the human: mental, physical, spiritual and emotional. It moves the learner from early to intergenerational learning, and formal to informal learning. It also looks at ten sources and domains of knowledge, five aspects of collective well- being, and nurturing guides for the learner. The Aboriginal Learning Knowledge Centre is an extensive learning hub, based in University of Regina, Saskatchewan, that is essentially practicing its title; it is a centre of Aboriginal learning.

A fundamental aspect of Aboriginal knowledge is language. AK is embedded into the Aboriginal language. This poses a significant issue as the current situation or plight of Aboriginal languages. The Royal Commission on Aboriginal Peoples (1996), in their 1991 census found that over a million people claimed Aboriginal ancestry. Of this number, approximately 190,000 claimed an Aboriginal language to be their mother tongue, of which 130,000 claimed to be speaking this at home. Thus, approximately 10 – 13 % of Aboriginal peoples spoke their Aboriginal language at home; a language not spoken at home cannot be transferred through to the generations.

One could look to Aboriginal knowledge and find Western science parallels of scientific methods. Oscar Kawagley writes:

> Science is the quest for knowledge to the Yupiaq, as well as a means to live a long and prosperous life. By assessing the physical phenomena of the present and juxtaposing it against past experience, we gain an idea of what the future holds. The Yupiaq ancestors would use their past experiences as examples of how life was lived and as lessons to be learned (Kawagley, 1995, p. 58).

The scientific methodologies from this view include the search for patterns, using these patterns to predict the future, a cause and effect model. It is evident that Aboriginal worldviews included many

of the same principles of the Western scientific method. Cajete cautions on defining AK by asserting:

> The fact is that Indigenous people are, they do exist and do not need an external measure to validate their existence in the world. Attempts to define Indigenous science, which is by its nature alive, dynamic and ever changing throughout the generations, fall short, as this science is a high context inclusive system of knowledge (Cajete, 1999, p. 81, 82).

The worldviews of AK and WMS are significantly different. Cajete proposes that conflict between worldviews exists only when one worldview is emphasized over another, that a balanced approach between the two worldviews can "show a bridge of understanding between two such strikingly different cultural mindsets as those in Native American ethno sciences and modern Western Science" (Cajete, 1999, p. 182). A complimentary presentation of these worldviews may present a balanced and more complete picture of our natural environment and our relationship with it (Cajete, 1999; Michie, 2002).

A complimentary worldview is now being investigated through the study of Quantum physics and the study of the subatomic particle (Peat, 1996). An examination of the objective observer presents the paradox of observing sub atomic particles. To measure a sub atomic particle is to shine a light upon it which subsequently influences the particle. Thus, the observer is not completely objective as their presence influences the experiment, resulting in inconsistencies of the principles of positivism. A further investigation may show the paradox tying WMS and AK. Heisenberg's principle states you can never be certain of the exact location or speed of a particle. The Heisenberg principle may be a tie into a holistic universe by disproving the linear cause and effect models of WMS.

David Peat, in his book *Blackfoot Physics* investigates the connection between Quantum physics and Indigenous ways of knowing. Peat compares WMS and AK:

> Indigenous knowing is a vision of the world that encompasses the heart and the head, the soul and the spirit. It could no more deal with matter in isolation than the theory of relativity could fragment space from time. Indigenous science does not seek to found its knowledge, as we do, at the level of some most ultimate elementary particle or theory, rather it is a science of harmony and compassion, of dream and vision, of earth and cosmos, of hunting and of growing, of technology and of spirit, of song and dance, of color and number, of harmony and balance, of death and renewal (Peat, 1996, retrieved April 12, 2005 from http://www.fdavidpeat.com/bibliography/books/ blackfoot.htm).

Definitions of Aboriginal knowledge are still challenging. So, what is Aboriginal knowledge to me? Primarily, it is a way of viewing the world. It includes *maya'ghila* (respect): respect for yourself, respect for your family, respect for your community, respect for your local surroundings and environment. It includes knowledge transfer; the readiness to accept teachings from your elders and environment and willingness to pass this on through the generations. It includes knowledge; knowledge of your local environment, knowledge of the language, songs, dance, and culture of your peoples. It includes modern dynamics; a capacity to recognize that we are a dynamic people, that we exist in a world different from our ancestors, a capacity to recognize that we must co-exist and survive in a multicultural world. It includes the simple fact that we must recognize how critical it is to keep our teachings alive, that this is our very survival.

Science Education

How science is taught in the classroom is often fundamentally different than the nature of science itself. Students are often indoctrinated with the body of knowledge about science and not the process of discovery of science. Science as instructed is 'often taught in the transmission model of teaching, in which students are bombarded with vast quantities of information produced by experts" (Kellogg, 1998, p. 213). Blades (2001) furthers this by labeling science education as a

'bulimic pedagogy' in which students are forced to assimilate facts from the textbooks throughout their science education.

Aboriginal knowledge and science are distinct subjects in the present BC public education process. Science as instructed in school is primarily WMS, dominated by subjects in secondary science such as Physics, Chemistry and Biology. The holistic nature of Aboriginal knowledge does not easily break down into disciplined based forms of knowledge such as Biology or Chemistry. This classification of knowledge has broken the world and the universe into disciplines and sub-disciplines so that students graduate "without any broad integrated sense of the unity of things" (Orr, 1993).

Aikenhead (1996) presents the terms, enculturation and assimilation to describe science instruction with respect to the learner. Enculturation is the result when the science instruction is generally supportive of the students' worldview. Assimilation is the result when science instruction is a disruption of the student's worldview, this being the present situation in science education with respect to our Aboriginal students. Battiste (2000) furthers this concept by labeling the present education as cognitive imperialism:

> Cognitive imperialism is a form of cognitive manipulation used to disclaim other knowledge bases and values. Validated through one's own knowledge base and empowered through public education, it has been the means by which whole groups of people have been denied existence and have had their wealth confiscated. Cognitive imperialism denies people their language and cultural integrity by maintaining the legitimacy of only one language, one culture and one frame of reference (Battiste, 1999, p. 12).

The present science education system presents a model driven on the memorization of facts derived from a body of knowledge that does not acknowledge or recognize AK as scientific knowledge (Blades, 2001; Kellogg, 1998; Swallow, 2005). WMS is communicated through the

written text, instructed in lectures and theories. The textbook and lecture model learning are the dominant form of instruction in the present science education model (Austin, 1982; Cajete, 1999).

AK has traditionally been communicated orally, instructed through observation and experience (Bracsoupe and Mann1999; Cajete, 1999; Campbell, Menzies, and Peacock, 2003). The Assembly of First Nations presents the holistic view of First Nations education by:

> First Nation education is one that focuses on the well-being of the student through a holistic approach that incorporates a deep respect for the natural world with the physical, moral, spiritual, intellectual and life skills of the student. First Nations education develops qualities and values in students such as respect for elders and cultural tradition, modesty, leadership, generosity, resourcefulness, integrity, courage, wisdom, compassion for others, and living harmoniously with the environment (Assembly of First Nations, 1988, p. 6).

Education has often been touted as the 'answer' to many of the social and environmental issues that our communities face (Castellano, Davis and Lahache, 2001). The present science educational model in school and universities are based in WMS worldviews which produced the present situation of our world (Aikenhead, 1996; Simpson, 2002). How does a student who is educated in the present WMS educational model address the present picture that our world and Aboriginal communities face? How can Aboriginal students learn WMS methods without losing their own cultural teachings (Aikenhead, 1996; Colorado, 1988)?

The answer to these questions may start with the simple step of incorporating AK into the science curriculum. "The aim of science curriculum should be to promote considerations of differing worldviews, not solely to enrich Western science, but to facilitate a two way exchange of knowledge and understanding" (Michie, 2002, p. 37). Olugbemiro and Aikenhead (1999) describe these opportunities as border crossings where the teacher of the class may act as a cultural broker. It is essential that our present science education model recognizes and incorporates knowledge from a multicultural base.

Sense of Place and Identity

A sense of place and a sense of identity are concepts that are embedded within Aboriginal peoples. One of the first teachings we learn is to state who we are and where we are from. As I opened my ears these past years, I have learned and heard the same question from our community members. They ask me, "who are your parents? Where are you from?" As I tell them, you see in their eyes as they place my spot in our world. 'Ohh,' they say, content and satisfied. I find myself doing that now, happy when I know where relations fit in, where people are from. As a teacher, I constantly drill this into my students, *who are you? Where are you from*? These are simple teachings; we do not need to overcomplicate things.

Our strength as Aboriginal peoples is derived from our sense of place, our connections to our origins. Cajete writes:

> That Indigenous culture is oriented to a place, a sacred bound place that we feel a profound connection to place, a place that Indians talk about (Cajete, 1999, p. 84).

Colorado furthers:

> Our teachings are based in the natural world; you have to know your roots, where you are coming from. You see a tree that is weak, about to give up. Sometimes you find people that are like that. Why is that tree barely making it? Because the roots are not strong. If the roots are solid and strong, then you a see a strong and pretty tree (Colorado, 1988, p. 50).

A healthy tree is deeply connected to its sense of place, a place where it belongs. This is akin to our Aboriginal populations. Our people are healthy Aboriginal peoples when they know who they are and know where they come from. The Dzawada'neux people of Kingcome Inlet possess this strong sense of place. They are fortunate to still live in the valleys of their origin stories. They are a people who know who they are and where they come from. It is this knowledge and experience that gives them strength. Logging companies have come and gone from this valley, for

it is no longer economically viable for them to stay in the Kingcome Valley. Logging company contractors see their sense of place solely in economic terms, or that this valley is an asset, not as their home. By contrast, a sense of place amongst peoples living in a home community ensures a sustainable relationship with our natural surroundings.

Hampton identified spirituality as his first standard of Aboriginal education and identifies place as another standard. "Indian education recognizes the importance of an Indian sense of place, land and territory" (Hampton 1995, p. 81). However, the present educational system, even under the pretense of environmental education teaches students that a 'relationship with place is marginal, uninteresting and unimportant" (Sanger, 1997, p. 4). Our present educational system presents theories, ideas and places in textbooks, a sense of individual over community; it disconnects us from a sense of place (Orr, 1999; Sanger, 1997).

Sense of place, a concept long held by Aboriginal peoples is emerging as a concept amongst science educators (Lutts, 1985; Sanger, 1997; Swallow, 2005). Environmental educator Lutts defines a sense of place as the "multitude of factors, including its physical, biological, ecological, cultural features, as well as the history and psychological state of the person who experiences it, which combine to give each location its unique spirit" (Lutts, 1985, p. 35). "Learning about your sense of place has significant potential for meaningful and relevant science curriculum and instruction" (Swallow, 2005, p. 8).

A sense of place lends oneself to a sustainable relationship with our local surroundings. As "we work in our own particular place… we work to protect the integrity of habitats and life forms, we experience a personal integrity and a sense of genuine accomplishment" (Snively, 2002, p.4). A sense of place is particularly relevant to this proposed project as the digital films produced will be based through the investigation of our local surroundings.

A sense of place and sense of identity form a reciprocal relationship; a sense of place forms a sense of identity and a sense of identity forms a sense of place. A critical and often overlooked matter is the diversity of the Aboriginal population across the country. British Columbia itself is considered one of the most diverse language regions in the world, being home to 27 – 34 languages representing 8 distinct language families. "Our linguistic and cultural diversity is further complicated by post contact categories such as Metis, status and non-status, treaty and non-treaty, on and off-reserve, urban and most recently Bill C-31" (MacIvor, 1995, p. 12). Urban Aboriginal populations living in such environments find that they are often isolated, scattered and mixed so that they can identify with many nations (Voyle and Simmons, 1999).

Aboriginal students exist in two worlds; they exist in a Western world that predominates us and their own personal Aboriginal world. Such an existence provides a tremendous amount of inner tension, of inner resistance. This inner resistance and tension is unique to each child and their story, their family origins and background. Williams proposes that successful Aboriginal students often exist at the polar ends of this spectrum (Lorna Williams, personal communication, EDCI, University of Victoria, July 2004). They can live in an immersion within their culture or at a complete disconnect. Immersion within their own culture provides students with the self confidence to succeed, a disconnect with their roots allows youth to live and succeed according to Western criteria. However, the majority of our youth exist somewhere in the tense middle ground of these two very different worlds. Aboriginal youth are forced to face this tension and choose which world to live in. They are often forced to value one world over another (Lorna Williams, personal communication, EDCI, University of Victoria, July 2004).

A sense of identity is a concept that our Aboriginal students all face. One tool for enabling our students an avenue to communicate, to present and share their stories is through the use of digital

videos. Sharing our stories develops a sense of personal identity, develops a sense of pride, of locating our place in the world. Through his involvement with the Traditional Pathways to Health Project (described in next section), filmmaker Alvin Dick shares:

> It (the experience of doing a video project) did sort of bring my conscience back about some of the things I just sort of left behind. I know that I've gone through a lot myself and sometimes it doesn't really seem like something that's worth holding onto. I don't know. There's always a reason. I figured I came back for some reason. Just trying to hold my family honor, cuz that's what it's all about (Dick, 2004. p. 4).

On April 7th, 2009, the Sooke School District (SD 62) signed their Aboriginal Education Enhancement Agreement (EA), an agreement between the school district and the Aboriginal community (Sooke School District, 2009). An EA is a working agreement between a school district, all local Aboriginal communities, and the Ministry of Education. EA's are designed to enhance the educational achievement of Aboriginal students (BC Ministry of Education, 2008). SD 62's EA defines factors of Aboriginal student success as:

- When students feel welcomed and supported in their school environment, and their historical and contemporary realities are reflected in the academic curriculum and extra-curricular activities,
- Students possess an increased sense of self esteem, sense of self – identity and a belief that the future offers them hope and opportunities (Sooke School District, 2009).

As such, SD 62's first goal in their EA is*:*

1. To increase Aboriginal students' sense of place, belonging and caring in School district 62 (Sooke School District, 2009).

The rationale to increase Aboriginal students' sense of belonging in SD 62 is that when Aboriginal students and their families are welcome, respected and included, through seeing aspects of their culture included in the environment and curriculum of the school, they become

inspired to become successful (Sooke School District, 2009). A survey on the BC Ministry of Education's Aboriginal Education website illustrates that 'a sense of belonging' is one of the common goals amongst school districts (BC Ministry of Education, 2009).

Thus, a sense of place amongst people has many positive aspects. This includes a sense of developing a sustainable relationship with the local environment. In a world where we are losing an acre of rainforest a second, it is clear that a sense of place on a global scale is required. A sense of place in a school environment increases the chance for students' to become successful in school. Through incorporating Aboriginal knowledge into our science curricula through digital films, we may motivate our students to learn science as it directly relates to their heritage, their sense of identity.

Participatory Action Research

This research project, through its delivery and goals aligns itself with the principles of Participatory Action Research (PAR). Dr. Budd Hall outlines six principles of PAR as: its alignment with marginalized participants; it involves partners in research; its questions originate in community; its goal is to change, not just understand; it is a tool for mobilization; and the researcher is a co-learner engaged in the process (Hall, 2000).

Hall was an architect of PAR methodologies, through his research work in Tanzania in the early 1970's. The alignment of marginalized participants in Tanzania correlates to our marginalized Aboriginal populations in Canada. This includes the facts that:

- Aboriginal students are more likely to be from single parent families, have poorer health status, higher rates of homelessness and greater housing need;

- Aboriginal people tend to have lower educational levels, lower labor force participation rates, higher unemployment rates and lower income levels;
- Aboriginal people received lesser education through the residential school systems of the past, are over represented in the child welfare and criminal justice systems and are more likely to experience domestic violence (Johnson, 2004).

It is essential that the researcher understand the worldview and beliefs of the community before a positive relationship begins (Ibrahim, 1985). Subsequently, questions that originate in the community will develop from concepts of sense of place. As such, digital videos on Aboriginal knowledge and science will primarily develop from the local community.

A goal of PAR is to change, as a tool for mobilization has many meanings in relation to this concept. The use of digital video may provide the avenue for students to make personal changes in a journey of self identity. It is anticipated that PAR may act as a tool to mobilize and change Aboriginal student performance and participation in science and as a bridging tool for Aboriginal and Western worldviews (Colorado, 1988). It may also induce personal change through the student's personal capacity building through their involvement in research, community leadership and learning to use digital video hardware and software (Riecken, 2004).

Hall's sixth principal is that the participant is a co-researcher, engaged in the process of the project. This addresses the question posed earlier with respect to relevance; student's learning is directly related to the relevance that they associate with material presented (Cajete, 1999). Student as researchers on topics of their choice provides a collaborative and positive learning process (Colorado, 1988; Curry and Bloome, 1998; Riecken, 2004). Students actively involved in learning of direct relevance to them will become independent thinkers and responsible human

beings (Wells, 1994). It is anticipated that students will choose subject matter relevant to them and relevant to their personal heritage.

Colorado (1988) proposes that PAR may be the tool to help bridge that gap between Aboriginal and Western worldviews:

> Synthesizing diverse systems of thought require an infrastructure to provide opportunities for cross-cultural scientific exchange, consultation, co-operation and collaboration. Both the framework and methods of PAR suggest its suitability as a bicultural scientific synthesizer (Colorado, 1988, p. 62).

Aikenhead complements this by adding "clearly, community based participatory research is one way to develop an appropriate subculture for school science" (Aikenehead, 1996, p. 229). Castellano developed eight principles of Aboriginal research, the first principle being: Aboriginal peoples have an inherent right to participate as principals or partners in research that generates knowledge affecting their culture, identity and well being (Castellano, 2004, p. 109).

The PAR methodology process may also re-invigorate a traditional knowledge transfer system. Traditionally, knowledge was transferred from elders to the youth. Presently, youth are programmed to seek their knowledge from schools, from written texts. I observed this phenomena in First Nation art classes, where students will search for art ideas and tips from the books on the shelves, or websites on the internet, and not the artist (in residence) in the front of the class. By interviewing elders and community members for films on AK, a more formal relationship of knowledge transfer may develop as students recognize that the knowledge that they and their families know is important.

The Use of Digital Video as a Learning Tool

The use of digital video as a learning tool is a core component of this research project. The majority of students enrolled in school today are well versed in computers and their multitude of software applications (Riecken, 2004; Tapscott, 1988). Our youth are raised in a digital world, music videos, email, and television; hence students are well versed in viewing the expression and transfer of ideas and knowledge electronically. Riecken (2004) in his work with First Nations students and the use of digital video proposes that digital video is producing a new format of literacy, a digital literacy. Within this new literacy, video production is to viewing as writing is to reading. The use of digital film allows today's students to pursue academic content in their own language (Ohler, 2008).

In his work with elementary students, Michael Apple (1991) offers three reasons as to why he chose film-making as his medium. Firstly, it engages the class as soon as possible and offers them an opportunity to reflect. Secondly, it allows cross-curricular integration of subject matter seamlessly. Thirdly, to demonstrate how using technology in the classroom is "more than a way to get from point A to point B, but inherently offers more ethical, aesthetic, and political possibilities than can go well beyond what now exists in so many classrooms" (Apple, 1991, p. 215).

Apple's study was in 1991 using 16 and 8 mm film. The production of desktop video in recent years has made it relatively straightforward through the advent of computer and software technologies to create films. Using interfaces that promote a drag and drop editing process, students may quickly pick up editing film, and develop still and audio clips into movie productions. The expression of their ideas is enhanced through the many options provided by multi-media. The concept is that students of a digital age will be able to fully express their ideas and concepts through digital media more so than through media limited to text only forms of representation. This

has initiated a swing towards students as producers of, and not just consumers of media (Goldfarb, 2002).

Aronowitz and Giroux (1990) propose a pedagogical model that acknowledges the value that marginalized communities place on mass media. Sites or schools that promote the use of mass media are seen as relevant meaningful places for students. "The use of mass media reaches down to the inner dimensions of human character, allowing for a kind of cultural expression that is otherwise oppressed" (Aronowitz and Giroux, 1990, p. 59).

Jason Ohler has recently authored a book, *Digital Storytelling in the Classroom* (2008) where he provides twenty revelations about digital storytelling in education, many directly relevant to this research project. Three of these revelations are related to the student, teacher and classroom delivery.

"It is the special responsibility of teachers to ensure that students use technology to serve the story and not the other was around "(Ohler, 2008, p. 6). Essentially, Ohler is saying that if you don't have a good story to tell, the technology will not make the story any better. He uses the metaphor a guitarist, whereas the tool of an amplifier will not make the guitar player any better, just louder.

"The attitude is the aptitude" (Ohler, 2008, p. 7) is Ohler's second revelation. Ohler refers to attitude in reference to lifelong learning; that in today's digital world, the notion of lifelong learning is applicable as ever. Our students live in an informational digital age where "your attitude towards learning new things plays an important role in determining your aptitude and intelligence" (Ohler, 2008, p. 7). That is, teachers' or students' attitudes towards using digital technologies in their classroom is of critical importance. An attitude not geared towards being open to digital learning and its use will be a "confusing waste of time" (Ohler, 2008, p. 7).

"Technology doesn't make teachers obsolete. Quite the opposite. More than ever, students need the guidance and wisdom teachers offer to help them use technology with care to tell stories wit clarity and wisdom" (Ohler, 2008, p. 13). Often, teachers are reluctant or feel a sense of trepidation towards the use of technology is their classroom. However, the teacher in the classroom is an invaluable necessity guiding the class onwards throughout the film project. Ohler stresses that the teacher need not be an advanced technician, the students of today are proficient enough in that regard. What they need to be is "the guide on the side rather than the technician magician" (Ohler, 2008, p. 13).

Ohler focuses many of his revelations on the 'story', and how digital technologies may assist in that manner. These include:

1. The digital revolution in a sentence: Finally, we all get to tell our own story in our own way.
2. Stories help us make sense out of the chaos of life.
3. Stories are more than just good for us, they are essential for our survival.
4. Stories help us remember.
5. Digital stories combine traditional and emerging literacies, engaging otherwise reluctant students in literacy development (Ohler, 2008).

These five revelations above clearly link to this research project, of allowing our Aboriginal youth an avenue to share their stories. An unfortunate truth in Canada's history is that our Aboriginal history is one filled with conflict and chaotic stories. It is also true that the heartbeat of every good story is conflict resolution (Ohler, 2008). Thus our Aboriginal history should provide the subject matter for good stories.

Storytelling is a traditional and effective method of learning in Aboriginal communities (Cajete, 1999; Campbell, Menzies, and Peacock, 2003; MacIvor, 1995). The production of digital videos allows the student to be the storyteller, the messenger:

> Story telling was often used amongst native peoples, not only for moral teaching, but for practical instruction. One advantage for telling a story to a person rather than preaching at him is that the listener is free to make his own interpretation. Perhaps the distance between the two interpretations is the distance between the two human lives bound by the same basic laws of nature illustrated by the outline of the story (Manuel, 1974).

The paradigm of creativity does not fit easily into our present science education model. However, it is embedded into the process of creating digital videos. Creativity is an essential component of Aboriginal and cultural knowledge. Ohler offers that art and the creative aspects it entails should be considered the fourth R (Ohler, 2008). Aboriginal knowledge may be looked at as a creative process in which to describe our natural environment (Cajete, 1999).

There can be some direct relations between the use of digital video and traditional methods and philosophies of Aboriginal learning and knowledge: experiential learning, storytelling, and creativity. "Experiential learning is the most basic and holistic type of human learning" (Cajete, 1999, p. 55). Cajete furthers by "experiencing through watching, listening, feeling and doing gives reality and meaning. By combining story with experience, Native Americans are able to achieve a highly effective approach to basic education" (Cajete, 1999, p. 128). Through students producing their own videos on topics of their own choice, they engage in experiential learning; they are learning by doing.

I have been involved with the Traditional Pathways to Health (TPTH) as a community partner since the fall of 2002. This project teams up university researchers and Aboriginal students

through the production of digital videos on themes of Health and Wellness. In a submission for the Canadian Journal of Education, TPTH is described as:

> The TPTH project is notably different from health curriculum typically found in North American high schools. Using the medium of digital video as a tool for research and communication, it focuses on topics that emerge from the students themselves rather than preconceived, externally generated ideas of health and wellness. Within the classroom context, students as co-researchers choose a health topic or issue that interests them; plan, videotape and create a video with their message; and present it to their community. Rooted in Indigenous pedagogy, there is a strong emphasis on connecting with the community and listening to Elders and learning from them as a rich source of information (Riecken, 2004, p. 1).

The production of digital videos allows our students an avenue to communicate, to present and share their stories. Sharing our stories develops a sense of personal identity, develops a sense of pride, of locating our place in the world. Students often chose topics that connect themselves to their culture, or their community's way of life. TPTH goals or themes are health and wellness. Students aligned themselves with their involvement with culture or community in an approach to producing films on themes of 'what is keeping me healthy'. This is counter to producing films of "what is not healthy or not well for me?" Thus, many students took a holistic approach that their involvement in cultural practices such as drumming or talking circles, staying in school or being involved in sports was keeping them healthy. Films on unhealthy activities such as drugs and alcohol misuse were still produced, but were in the minority.

It has been through the success of this model that lends itself to the project of *The Use of Digital Video as a Learning Tool for Reflecting and Documenting Aboriginal Knowledge with Respect to Science*. The production of digital videos that allows our students an avenue to communicate their personal stories may also be a tool to present a complimentary worldview, one that may help bridge an Aboriginal and western worldview.

Summary

A journey through a review of the related literature examined five related areas with respect to the proposed research, *The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal knowledge with Respect to Science*. As an Aboriginal educator, I am drawn to the topic of the proposed research as I envision an educational model that respects and incorporates Aboriginal knowledge into the curricula; that transfers this knowledge to our students in a traditional and effective manner; that allows them an avenue to explore and strengthen their sense of identity and place, that allows the students the opportunity to initiate the learning; and to learn and present their research in a creative and technological method. Admittedly, the present literature presents only selected aspects of the broad areas of which this research draws from.

However, it is anticipated that the research will provide a fresh and innovative approach to learning and documenting Aboriginal knowledge, in particular as it places the onus on the students to be the producers of the knowledge transfer. The significance of the proposed research was deep within me; that the transfer and retention of our Aboriginal knowledge to our children and children yet unborn is the essence of our very survival.

CHAPTER THREE: METHODOLOGY

Background

This research project, being one of several case studies comprising the Aboriginal Science Research Project purpose was to address the under-representation of Aboriginal students in science classes in British Columbia, and the under - representation of Aboriginal people in science related careers. The main purpose of my proposed research was to investigate whether using digital film in the documentation and reflection of Aboriginal knowledge with respect to science is a positive learning tool.

I chose the methodology of Participatory Action Research (PAR) to guide my research project. My decision to do so was based on two primary reasons, my positive personal experiences with PAR, and the relevant literature supporting its use, particularly amongst Aboriginal communities. The first reason was my experience with PAR as a community partner with the Traditional Pathways to Health (TPTH) research project. The TPTH project overview and rationale for PAR was described as follows:

> Using a model of participatory research, the project engages students in an exploration of the meaning of health and wellness. It places student interests and their identities as Aboriginal learners' front and center in the investigation of what it means to be healthy in the context of First Nations communities and cultures in this time. By working with the university research team, the students learn to use digital video technologies and the processes of documentary and ethnographic film making to put together their narratives about health and wellness. (Riecken, Tanaka, and Scott, 2006, p. 30).

The positive experience with TPTH was coupled with literature that demonstrated that PAR is gaining a positive reception amongst Aboriginal communities as a research tool (Castellano, 2004). The benefits of PAR research are clear: students identify the issue they want to research, and

through their active involvement, they initiate the research and study the findings. The subject material and process of research can be empowering for students and community.

This project, through the guidance of PAR will yield data that will consist of two forms. First, the films produced by the students comprised a cultural archive of local Aboriginal knowledge generated through the students' own research efforts. A second data source consisted of the students' and participants own reflections of what they learned through the process of planning their research projects and creating their films. The data for this second part of the project was derived from the following sources: reflective logbook journals (attached in appendix C) and student and community participants' responses to a recorded interview on their participation and reflections of the project (attached in appendix B). To protect the anonymity of all participants involved, I coded and labeled all participants in a table, which is presented in table 1 in this chapter.

Setting

The FNGP is a sixteen and over education program for Aboriginal students in the Sooke School District, located just outside Victoria, BC. It is a small, alternative program, or program of choice enrolling approximately twenty-five students, at the Westshore Centre for Learning and Training. The FNGP shares the Westshore Annex, a school site of the Westshore Centre with the Fast Forward to Graduation (FF) program, another alternative or program of choice for students sixteen and over. The FF program targets students similar in background to the FNGP; however is not focused upon Aboriginal students. This research project took place within the FNGP's grade 11 Science and Media Arts (elective course for both FF and FNGP students) classes.

The FNGP originated in September of 2002 as an alternative option for school aged and adult Aboriginal students continuing or returning to their schooling. Its goals are to:

- Provide a safe, caring, open and exciting community for learning,
- Integrate First Nation culture and language,
- Involve the local community through the involvement of Aboriginal artists, cultural instructors, and Elders, and getting out to interact and meet with the community,
- Acknowledge the emotional pain that many of our youth and communities carry. It is hoped that if we can provide the above learning environment, academic success will follow (with patience).

The Sooke School District is one of three school districts in the Greater Victoria, Southern Vancouver Island region. This region, lying in traditional Coast Salish territory is home to three First Nations, including: Beecher Bay, Pacheedaht and T'sou-ke. The Sooke School district presently enrolls approximately 800 Aboriginal students, of which approximately 150 are from the three local nations (Sooke School District, 2008). Thus, the majority population of students and hence Aboriginal community in the Sooke school district region is off reserve.

A unique factor of the FNGP has been its consistent involvement with digital filmmaking. Through the school years of 2002 – 2005, the FNGP partnered with the TPTH creating over twenty films on themes of health and wellness. These film projects were offered as a voluntary research project with respect to the University research team within the Career and Personal Planning or First Nations Leadership class of the FNGP. This partnership allowed the FNGP to develop the experience and capacity to offer filmmaking classes through Media Arts 11 and 12 the school years of 2005 through to present. It has created a dynamic and reciprocal learning environment whereas the Media arts class documents and creates films on projects that the class may be working upon.

An example is the Irwin park restoration project which the FNGP and FF classes undertook in the school year of 2006-07, which the Media Arts class documented and created a film, “Irwin Park Community Project.”

Participants

This research project included four pools of participants: twenty - one First Nation students (FN), eight Fast Forward students (FF), six Staff members (STA) and nineteen community members (COMM). Each participant’s specific involvement is included in the participant matrix in the coded participants table, specifically under the topics of: produced film, did not complete film, appeared in film, submitted journals, and completed post project interview. The primary research group was the FNGP students who completed a film on the subject matter of Aboriginal knowledge and science, submitted their journals and completed a post project interview. The FF students’ involvement with films may have had subject matter that dealt Aboriginal knowledge and science (group films); however their involvement was more focused on their reflections on the use of digital film as a learning tool or as film participants (being interviewed). Community participant involvement focused exclusively on their role of being interviewed for the films. Many students (FNGP and FF) were also involved on camera for their own or other students’ films. Staff involvement focused on the assisting or facilitating the project, as well as being interviewed for the films.

Of particular interest were the twenty – one FNGP students. Of this group, fourteen were registered in the Science 11 class. Of this group of fourteen students, eleven completed films, while twelve submitted journal entries. Three FNGP students were not registered in the science course, and whose contribution was being filmed on camera. Four students were FNGP alumni

students who volunteered to submit their films, two from 2004, “Evolution of a People, “People of the Seafoam”, while another pair submitted their joint film from 2006, “Youth and the Environment”. Three Fast – Forward students submitted their film from the year 2006, “Irwin Park Community Project”.

All participants were categorized into their respective categories of First Nation students (FN), Fast Forward students (FF), Staff members (STA), community members (COMM), and coded numerically. I will refer to all participants through their coding to provide anonymity.

Table 1: The following twenty – five participants contributed to more than one aspect.

Participant	Produced film	Did not finish film	Appeared in film	Submitted journals	Completed post project interview
1. FN1	Y			Y	
2. FN2	Y			Y	Y
3. FN3	Y			Y	
4. FN4	Y		Y	Y	
5. FN5	Y		Y	Y	
6. FN6	Y		Y	Y	Y
7. FN7	Y		Y		
8. FN8	Y			Y	Y
9. FN9	Y			Y	
10. FN10	Y		Y	Y	Y
11. FN11	Y		Y		Y
12. FN12	Y		Y		

13. FN13	Y		Y		
Participant	**Produced film**	**Did not finish film**	**Appeared in film**	**Submitted journals**	**Completed post project interview**
14. FN14	Y				Y
15. FN15	Y		Y		
16. FN16		Y		Y	
17. FN17		Y		Y	
18. FN18		Y		Y	
19. FF1	Y		Y		Y
20. FF2	Y		Y		Y
21. FF3	Y		Y		Y
22. Staff1	Y(assist)		Y		Y
23. Staff 2	Y(assist)				Y
24. Staff3	Y(assist)				Y
25. Staff4	Y(assist)		Y		

Table 2: The following twenty – nine participants' contribution was their appearance on camera in a film.

First Nation Students	FN 19, FN 20, FN 21
Fast Forward Students	FF4, FF 5, FF 6, FF7, FF 8,
Staff	Staff 5, Staff 6
Community Members	Comm 1, Comm 2, Comm 3, Comm 4, Comm 5, Comm 6, Comm 7, Comm 8, Comm 9, Comm 10, Comm 11, Comm 12, Comm 13, Comm 14, Comm 15, Comm 16, Comm 17, Comm 18, Comm 19

Ethical Considerations

In Chapter One, I discussed the limitations of the research project, specifically the systemic challenges facing Aboriginal education, the limitations of research within Aboriginal communities, and the specific limitations of this research project itself. The specific limitations of this research project itself include the challenges of a new form of technology as a research tool, the use of PAR as a teaching tool and the consideration that the principal researcher (myself) is also the teacher.

While the majority of the limitations provide the setting for this research project, the challenge of being the principal researcher and teacher and the perception of bias and coercion was potentially a significant obstacle to overcome. Involvement in research projects must be completely voluntary, which runs counter to the mandatory assignments and due dates of teachers and projects in their classrooms.

I endeavored to meet this challenge through assigning students in Science 11 class with the project of creating films on Aboriginal knowledge with respect to science, and keeping journal reflections. If students agreed to voluntarily participate in the research project, their participation included:

- submitting of their completed film that they produced in class on Aboriginal knowledge with respect to science into the data collection pool
- submitting their journal reflections into the data collection pool
- Consenting to an interview once the research is completed.

As I was the teacher and also the principal researcher, certain safeguards were put in place in order to prevent power-over or coercion situations. These included a third party recruiter (FNGP alumni known as FN 11) who presented students with an opportunity to consent to participate in this research project. At any time, students could choose to withdraw from the project, although

none did. Once the course was complete (of which the creation of films and journal reflections were a component of), grades were submitted. Third party recruiter FN 11 provided students again with an opportunity to continue in the research project, of submitting their films and journal reflections into the data pool and consenting to a recorded interview reflecting their involvement in the project. Thus the students' participation in the project was not known to the principal researcher until after the grades were submitted.

It should be noted that four films were submitted from years 2004 - 2006. I had not originally considered doing so, but came to include them in the data set through the following rationale. The University of Victoria's Human Research Ethics Board suggested strategies for accepting submitted films and journals into the data pool once they were completed in order to prevent coercion or bias. As the FNGP had been creating films through the TPTH research project, I approached Dr. Riecken, my thesis advisor and principal investigator of the TPTH project in regards to the submission of data from this body of work. With his approval, four films, "Evolution of a People", "People of the Seafoam", "Youth and the Environment" and the "Irwin Park Community Project" were selected for inclusion because their subject matter was of direct relevance to this research topic. These student filmmakers were contacted and they consented that their films be entered into the data pool.

Research Stages

This research project consisted of three distinct stages: development, implementation and evaluation.

Development

The emergent stages of the research initiated through my early involvement with the TPTH in 2002 and a collaborative approach to research between the FNGP and the University of Victoria's TPTH team, using digital film as a research tool with Aboriginal youth on themes of Health and Wellness. It seemed a natural step to bring the medium of digital film to investigate the nexus of Aboriginal knowledge and western science. I enrolled in the University of Victoria's Graduate program entitled the Aboriginal Science Education Research project in the summer of 2004, spending a summer in Alert Bay, the cultural center of the Kwakwaka'wakw. My proposal, titled *The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal Knowledge with Respect to Science* was accepted by my graduate supervising team in the spring of 2006. I submitted an ethics of application for human research in November 2006 and was accepted in February 2007.

The research project was presented as a cross curricular school project in the subjects of Media Arts and Science 11 in the First Nations Graduation Program. Students registered in Media Arts 11 to learn the process of creating films. In their Science 11 class, the students were presented with a digital film project on the theme of Aboriginal knowledge with respect to science. It was a semester long project commencing February through to June 2007.

I was thus paralleling the class project with my research project. Third party recruiter FN 11 presented the research project to the class, outlining that their involvement in the project would be the submitting of their completed film into the data collection pool, submitting their journal reflections into the data collection pool and consenting to an interview once the research is completed. Third party recruiter FN 11 was selected as she was an FNGP alumni, familiar with the

FNGP and the process of creating films, and whom in the Spring of 2007 was an Media Arts teacher assistant.

The Science 11 (Science and Technology 11) enrolled fourteen students in February 2007. All fourteen students initially agreed to participate in the research project, paralleling their class project of creating a film on Aboriginal knowledge with respect to science. I had hoped that the enrollment for Science 11 would be greater. However, Science 11 was not a pre-requisite for graduation amongst the adult students at the FNGP, and thus five of these students chose not to register in the Science 11 class and focus their studies on their Math and English courses.

Implementation of Film Instruction

I used the overview in the BC First Nations 12 Digital Video Project Teacher Resource (BC Ministry of Education, 2004, p. 5) as a classroom model to follow, presenting five units of: exploration, pre-production, production, post production, and sharing and reflecting. It should be noted that film making projects are dynamic, creative and non-linear process where the art of filmmaking takes on a life of its own. Indeed, its attraction to students may be the unconventional approach it takes. However, these five units allowed for broad direction for the research project.

Class time for the Science and Technology 11 was in the Monday, Tuesday and Thursday afternoon class, from 12:30 – 2:45 pm. Wednesdays and Friday mornings were elective days at the Westshore Annex. Students could enroll in courses such as Media Arts, Construction, Career and Personal Planning, or Foods.

The FNGP attempted to deliver its classes based in Aboriginal pedagogies, many of which were expanded upon in chapter two. A simple example is to start classes with a talking circle, where the students introduced themselves and where they are from. Students go one at a time,

demonstrating respect for their classmates by standing and introducing themselves and where they are from. This grounding exercise can be expanded to furthering your introduction to parents or grandparents, or other topics such as, what are you thankful for, or subjects specific to classroom material.

In the ***exploration*** unit: students were introduced to the research project, started to develop their camera and film – making skills, explored themes on Aboriginal knowledge and science, and developed a research question to guide their path through the research project.

Through third party recruiter FN 11, the Aboriginal Knowledge and Science Research Project and this research project, *The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal Knowledge with Respect to Science* was presented to the students. Students were introduced to concepts of research such as ethics of research, consent, volunteer participation, and the ownership of research and films produced.

With respect to creating films, the students learned or built upon their technological capacities on the process of creating films. These included the development of technological skills through the use of digital camcorder and digital camera, and the development of technological skills through the introduction of movie and music making software, how to transfer film, how to edit film, and numerous software applications. Appendix C includes camera and equipment and video editing "checklists" to guide the teacher and students through the numerous hardware and software applications. For example, students would demonstrate their ability to insert and eject a DV tape, or transfer raw footage from the camera to the computer and their skills checked off by a teacher.

Classroom units started with themes of WMS, definitions of science, its history and the scientific method. The scientific method, discussed in chapter two is generally agreed to have four principle steps: observation, formulation of hypothesis, testing of hypothesis and conclusion or

analysis of the test (Lederman, 2002). I attempted and presented a student friendly introduction to the scientific method by guiding the students through its implementation in a social context of asking someone on a 'date'.

Fundamental within this unit on WMS was to guide the students in developing a clear understanding on the definition of science. We used the Merriam - Webster dictionary (2003) as a starting point and moved as a class definition to science as an "way of understating the world around us". I hoped to keep the definition as generic and simple to understand as possible. The first of ten free writing journals was introduced as a method to prompt student learning, one of the first topics being "science to me is". A full listing of journal topics is included in appendix C.

After we completed a class unit on WMS, the class covered 'science units' on the health and nutrition topics of: diabetes, sexually transmitted diseases, drugs and alcohol and nutrition. It was hoped that this subject matter would be directly relevant to the Aboriginal students in the class. For example, it was presented that diabetes is two to three times more common in First Nation populations than the general population (Assembly of First Nations, 2004). Indeed, the majority of the students in the class knew many family members directly affected by diabetes. It was anticipated that these subject materials may provide the topics for the students' digital films.

Students were introduced to the theme of Aboriginal knowledge and were provided examples of Aboriginal contributions to science and technology. These materials were presented primarily through teacher led discussions and teacher led brainstorming sessions. I used materials referenced from the online site for American Indian Contributions to the World (Porterfield, 2004) to prompt discussion. Chewing gum and rubber are two examples of discoveries or inventions accredited to First Nations of North America. The free writing journal "Aboriginal knowledge to me is" was presented to the students.

However, local Aboriginal contributions to science presented an initial challenge for students to grasp. Aboriginal knowledge and science were and are two dichotomies often not related and students struggled with the concept of their Aboriginal ways of knowing and science being related. If science was understood as a way to understand the world around us, it was anticipated that developing a greater understanding of Aboriginal knowledge would complement that definition.

I presented subject matters such as health and nutrition and strove for connections between WMS and AK. Health Canada (2004) provided invaluable resources on food guides, in particular the Canada Food guide for First Nations, Metis and Inuit families, which provided an enormous amount of information on traditional First Nations nutrition. I had hoped that the subject matters of nutrition or diabetes would have been chosen by students as a possible research topic for their films, and was admittedly slightly disappointed when they were not.

We also investigated fields such as botany, environment, traditional land use as specific examples of Aboriginal knowledge, knowledge best defined within the realms of Traditional ecological knowledge (TEK). Perhaps the best example here was the cedar tree. The cedar tree, known as the "Tree of Life" amongst First Nations people was a subject matter of significant interest to me and familiarity with many of the students. Our First Nations art class participated in annual cedar bark stripping trips throughout the local communities where we learned of the "seasons" of stripping, the history of the cedar tree and culturally modified trees, the process of cedar bark stripping, and the numerous applications that the cedar bark maintained for local First Nations. The book, "Cedar, Tree of Life for First Nations" by Hilary Stewart (1995) provided a valuable class resource. The First Nations art class produced many beautiful cedar pieces, including simple baskets, rope and bracelets, and a graduation hats for Westshore graduates. The book, "Plants of Coastal British Columbia" by Pojar and Mackinnon (1994) provided a valuable

class resource on the uses of cedar traditionally, end ecological information presented through a WMS lens.

It was also of slight disappointment that the subject matter of cedar was not chosen as subject matter for a more in-depth investigation through a research project. It seemed a natural connection for the film criteria, and the opportunity for footage and research (both personal and in textual form) was readily available. However, the methodology of PAR determined that the students choose a research question themselves. An unexpected topic did arise through a student skimming a First Nations art book, "Mythic Beings" by Gary Wyatt (1999) where he came across Moon designs by Nuu–chah–nuulth artist Tim Paul and subsequent oral histories on the moon. This initial interest that paired an Aboriginal and astronomical perspectives on the phases and eclipses of the moon provided the subject material for the film.

The introduction of the themes of AK and science and the formation of the research question were strongly connected, whereas it was anticipated that students may form a research question of interest from the correlation of the themes. It was through these themes and fields in the exploration unit where we worked with the students on the formulation and development of their research question that guided their research project in creating digital films. The student selection of their own idea, their own research question within the parameters of the subject matter, Aboriginal knowledge and science was one of paramount significance.

The selection of the research question was student led with teacher support. Using the definition that science was a way to help us understand the world around us; themes of AK were presented as a starting point for the question. For example, student FN 1 wanted to create a film on Aboriginal language specific to her community. With teacher assistance, we guided her towards

the research question of "How does a greater understanding of Aboriginal languages assist us in a greater understanding of the world?" Thus the formation of the research questions was formalized with teacher assistance. As mentioned, there were five films submitted into data pool that did not originate from the Science 11 class. Two films, "Evolution of a People" and "Seafood for Life" originated through the TPTH project whose research question probed Aboriginal youth on what keeps them healthy and well. As it turned out, what keeps them healthy and well also presented a greater understanding of the world around us as well. Thus, the research questions for these films are based upon the TPTH research project. Research questions are included in the beginning of Chapter Four with film descriptions.

If students were able to choose a subject matter of significant relevance to them, their involvement throughout the rest of the project was much greater. This matter was introduced in the original proposal under limitations and it proved accurate in this research project. In this research project, two new films were created on Aboriginal languages, and two on drugs and alcohol, both subject matters with significant relevance to the students, and this translated into a sense of urgency and ownership within those students involved. Another student chose a topic because "John told me so", which not surprisingly paralleled his involvement with the film project. It was of initial surprise to me that Aboriginal languages were chosen as research topics with respect to science. However, through further contemplation, I believed that the knowledge embedded within language paired with the students' commitment to the subject matter would meet the criteria for the creation of a film.

The formulation of the research question moved the project into the ***pre-production*** unit. This unit focused on the development and production of a project proposal (sample attached in

appendix C). The project proposal guides the students throughout their project and asks the students to formulate their: theme, concept, target audience, resources required and a general description of their proposed film.

The research question and project proposal allowed students to begin their research on their chosen topics. Examples of research questions could be: what traditional knowledge is embedded within the local Aboriginal language? What traditional knowledge is known of the local seashore? Or questions such as what does science mean to you? With the research question formulated, students began their research for their film the Internet, from the library, museums, and archives, planning potential interview sources such as elders, community members, and planning potential scenes with respect to Aboriginal knowledge and science. The scheduled plan or interviews and activities, compiled with still photos, music, and research information was composed into a storyboard or script that guided the filmmaking process.

The pre-production unit completed with the creation of a storyboard or script that guided the students through the filming in the ***production*** unit. The storyboard (sample attached in appendix C) directed students to focus on their film genre (narrative, documentary, still picture collage, role play) and the sequence of the film through the opening, development and conclusion. The production unit brought the storyboard to life with rehearsal, practice shots and interviews, through to the filming of activities and conducting of interviews.

It was important to stress to the students the notion of informed consent that must be transferred through to community participants. All community participants must sign an informed consent form that informed them that they may be filmed on camera and that they may be included

in the student's film. The community participant's participation in the film must be completely voluntary and if at any time, they chose to remove themselves from the data pool, they can do so without any consequence. The community participants were allowed the opportunity to review their on camera footage and were invited to join the students at the movie showing. Copies of the films were made available at no charge for any community participant who requests a copy.

This stage moved into the ***post-production*** unit where the raw footage is transferred onto computers and edited into five - ten minute film features. The computers at the FNGP are Apples (IMacs) and provide numerous editing options. I - Movie is an introductory editing program, and was the film-making software of choice. Final Cut Express is the industry standard of film making software and was used in the film, "Evolution of a People", and the two class projects, "Beecher Bay Cultural Event" and "Irwin Park Community Project". *Garageband* is music compilation software used for creating music for the majority of the films. A full list of software applications is included in appendix C in the Media Arts course outline.

The process of editing the raw footage proved to be the most time consuming. As a general rule of thumb, film production requires sixty minutes (at least) of editing time for every one minute of film (Ted Riecken, personal communication, EDCI, University of Victoria, July 2005). The raw footage was logged in a raw footage log (sample attached in appendix C), and reviewed for a revised video sequence. The production of the final films and the time required to create the final film is dependent upon numerous factors, including: the commitment or sense of ownership the student has to the project, the amount of technological effects a student may want to introduce, and quite often, technological 'good luck' as movie making software has a tendency to freeze or

crash unexpectedly leaving students unsaved works lost. The post production unit closes when the final edited films are then transferred onto the creation of masters on the medium of DVD discs.

The process of creating films can be a rewarding, yet frustrating experience for students. It can also be a challenging project to fit within a Science 11 class as it can be time consuming and contain technological or hardware constraints. Computer time needed to be allocated as more than one project was shared on each computer. Thus, not all students could work on their films in the class time allotted. There was also a significant other curriculum to cover in the Science 11 class that restricted the available class time available. The FNGP aimed to lessen that frustration of the students and make the project feasible for the classroom through sufficient mentor support and computer availability throughout the week.

Media arts instructor Staff 1 made herself available Monday, Tuesday and Thursday mornings starting in April of 2007, which the Westshore School supported. The Media Arts class had scheduled class times all day Wednesday and Friday mornings where some of the students were registered and could work on their Aboriginal knowledge films as a component of that class. FNGP alumnus FN 11 assisted as a support worker in the Media Arts program and ably assisted Staff 1 and students working on films. UVic graduate student and TPTH research assistant Staff 2 were available for assistance two or three times a week, usually in two hour visits. This support was above and beyond what was provided through myself as the FNGP teacher and the Aboriginal support worker Staff 3.

The ***sharing and reflecting*** unit started by first sharing films with other students with personal reflection and class feedback by viewing the films on a 'rough cut' day. The rough cut day was

shown on Wednesday, June 6th, 2007. The rough cut day allowed the students a valuable opportunity to self assess their film in front of their peers, as well as receive peer and staff oral and short note reflection and assessments.

The major component of the sharing and reflecting unit was the planning of the final Movie Day. Inherent within Aboriginal ways of knowing is celebration of achievements with family and community, a celebration that however requires considerable planning. This planning included promoting the school and community film day; planning for the number of guests and subsequent food and drinks; following protocol in proper invitation of elders; preparing newsletters; and practicing public speaking in introducing and answering questions on their films, and the welcoming of guests.

The final Movie Day was shown on Wednesday June 13th, 2007, in conjunction with other student films produced in the Media arts class. The FNGP classroom was transformed into a movie theatre, seating in rows, the finished films shown on large screen via a projector, with bags of popcorn and boxes of juice for the attendees. Students introduced their films, and provided a background or rationale for why they made the film and answered questions afterwards. The students were then recognized for their efforts through a certificate of completion at the end of the Movie Day.

Following the movie day, the students were given master copies of their films in DVD format, complete with box covers and titles. The research project then entered into the evaluation stage.

Evaluation

The evaluation of the project was conducted throughout the research project. I received feedback from students throughout the project orally that guided the research project. For example, students commented on the limited time available on the computer and limited time available with teachers or mentors. Thus, through the support of the Westshore school, Media arts instructor Staff 1 and FNGP alumni and TPTH research assistant Staff 2 increased their available time with students. Media arts instructor Staff 1 made herself available Monday, Tuesday and Thursday mornings starting in April of 2007. UVic graduate student and TPTH research assistant Staff 2 were available for assistance two or three times a week, usually in two hour visits. This support was above and beyond what was provided through myself as the FNGP teacher and the Aboriginal support worker Staff 3. The compilation of the data sources was the first step in the evaluation stage. The analysis of the data comprised the second step.

Data Sources

I gathered data from three distinct sources: weekly student journals, student, staff and community participant interviews, and the films themselves. In effect, there were three parties involved in the research project that formed the data: the student participants, community participants and FNGP and Westshore staff.

Weekly Journals

The student participants completed eleven weekly journals throughout the research project (attached in appendix C) that were submitted and entered into the data pool. These journals strove to mirror the class and project progress, moving from initial topics such as: *Aboriginal knowledge*

to me is…. to *I can get help on my project by…, from…* to reflective prompts such as *The most important thing to me in what I have learned is*…. . Of the fourteen students in the science class, twelve students submitted the majority of their weekly student journals.

Interviews

An interview is defined as a structured oral or possibly written exchange with someone. Its aim is to gather information (Freeman, 1998). They are considered one of the most important sources of information gathering (Yin, 1989). After the final movie day on June 13th, FN 11 and I conducted recorded interviews with students, community participants and staff members involved. A challenge of this process was the short time frame from the movie day on June 13th until the last day of school, June 20th before the provincial exam period began. We conducted thirteen interviews in this time period, consisting of six FNGP students, two community participants (Aboriginal artist and TPTH research assistant), two Westshore staff (instructor and support worker), and three Media Arts students. The three Media Arts students were non – Aboriginal students from the Fast Forward class. I had not originally thought of interviewing them, but I considered their involvement in the process of filmmaking and their work in creating a film rehabilitating a community park project relevant to the data pool.

I had anticipated in interviewing more than six FNGP students, but encountered numerous challenges. The aforementioned challenge of time presented, a one week window provided limited opportunities. The challenge being: had we moved the Movie Day a week earlier, we may have limited the number of completed films. As well, the week of June 13th – 20th in a school setting is very challenging as an unfortunate truth is that during the last month of school, the excitement of the upcoming summer holidays and the majority of school work complete, generally produces

poorly attended classes and unfocused students. There were also two young ladies who agreed to permit their films into the data pool, yet declined a post project interview.

I used three forms of questions, one for the FNGP students, one for the Media Arts students and one for the community participants and staff. These are included in the appendix B. They varied through FNGP students answering questions on Aboriginal knowledge and the process of making films, whereas the Media Arts students had less focus on Aboriginal knowledge and more focus on the process of making films. This was because the Media Arts students were not registered in the Science 11 class. The community participants and staff questions omitted questions with respect to making films.

The interviews took place in a private office at the Westshore Annex, and ranged in length from ten to forty-five minutes. The shortest interview was ten minutes with a particularly reserved FNGP student, FN 2, whereas the forty-five minute interview was conducted with staff member and Media Arts instructor, Staff 1. They were conducted using a digital recorder. I transcribed the interviews in July and August of 2007. There was a sum total of 116 pages of approximately 23,000 words of transcribed interviews.

The Films

There were ten films submitted into the data pool. Of the ten films submitted into the data pool, five originated from the Science 11 class. Two films were films submitted from the Media Arts class with subject material relevant to the topic, and three additional films were submitted from former FNGP students from 2006 and 2004 with subject material relevant to the topic. The films were primarily documentary style, interviews with local elders and community members, interspersed with written information, still pictures, music and skits. The films were transcribed

word for word onto index cards (126 in total). A total of forty - two people, ranging from students to elders and artists were filmed in the ten films. I will present the films and their participants below, and brief descriptions of each film, including their research question in the beginning of Chapter Four.

1. ***Language*, 2007**: produced by a FNGP student. There were four community members interviewed on-camera for the film. This student filmmaker declined a post project interview.
2. ***Nuu-chah-nuulth Language*, 2007**: produced by two FNGP students. There was one community member interviewed on-camera for the film. One student completed a post project interview, while the other student filmmaker was unavailable for a post project interview.
3. ***The Moon*, 2007**: produced by a FNGP student. There was one community member (Aboriginal artist) interviewed on-camera in the film. This student filmmaker completed a post project interview.
4. ***Drugs and Alcohol*, 2007**: produced by three FNGP students. Two FNGP student filmmakers were interviewed on camera in the film; however one declined a post project interview, while the other two student filmmakers were unavailable for a post project interview.
5. ***Pros and Cons of Marijuana Use*, 2007**: produced by two FNGP students. There was one community member and two FNGP students interviewed on camera in the film. One student completed a post project interview, while the other student filmmaker was unavailable for a post project interview.

6. ***Beecher Bay Cultural Event*, 2007**: produced by FNGP and FF students. Three community members were filmed for the finished project. Two students (one FNGP and one Media Arts student) completed a post project interview.
7. ***Youth and the Environment,* 2006**: produced by three FNGP students. One student completed a post project interview, while the other two student filmmakers were unavailable for a post project interview.
8. ***Irwin Park Community Project*, 2006**: produced by FNGP and FF students. This film included two community members, ten students and four staff members interviewed on camera for the film. Two Media Arts students and a Westshore staff member completed a post project interview. This film was in partnership with community partners of Westshore, UVic, Colwood Rotary and the city of Langford
9. ***Evolution of a People*, 2004**: produced by a FNGP student. There were six Aboriginal community members (five of which are artists) interviewed on camera. This student completed a post project interview.
10. ***Seafood for Life, 2004:*** produced by a FNGP student who was unavailable for a post project interview.

Table Three: Films and their participants

Films	FNGP	FF	Staff	Community
Language	FN 1			Comm 1, Comm 2, Comm 3, Comm 4
The Moon	FN 2			Comm 5
Drugs and Alcohol	FN 3, FN 4, FN 5			

Pros and Cons of Marijuana Use	FN 6, FN 7			Comm6
Nuu-chah-nuulth Language	FN 8, FN 9			Comm 7
Beecher Bay Cultural Event	FN 10	FF 1	Staff 1	Comm 8, Comm 9, Comm 10
Youth and the Environment	FN 8, FN 12, FN 13, FN 19			Comm 11
Irwin Park Community Project	FN 8, FN 9, FN 11, FN 14, FN 19, FN 20, FN 21	FF 1, FF 4, FF 5, FF 6, FF 7, FF 8	Staff 1, Staff 4, Staff 5, Staff 6	Comm 20
Evolution of a People	FN14			Comm 14, Comm 15, Comm 16, Comm 17, Comm 18, Comm 19
People of the Seafoam	FN15			Comm 12, Comm 13, Comm 20
Media Arts Films (not submitted, student producers interviewed)		FF 2, FF3,		

Data Analysis

The data sources produced a considerable and diverse data pool. There was a total of twenty-five participants who participated in more than one aspect of the research project, from producing a film, appearing on-camera in film footage, completed a post project interview and submitted their weekly journals. There were twenty-nine participants whose participation with the research project was the knowledge they shared on camera within the films. The data sources consisted of three primary sources

1. The ten films. These films were viewed numerous times and handwritten transcribed onto index cards. I also made notes on setting, mood and themes presented in film.

2. Interviews: I conducted thirteen post-project interviews, ranging from five to forty minutes in length, recording with a digital recorder. I transcribed them for a sum total of 116 pages of approximately 23,000 words of transcribed interviews.
3. Weekly journals: Twelve students submitted eleven weeks of weekly journals.

My initial stages of data analysis started with watching the films and reading the transcriptions of data repeatedly. I dated and numbered the transcriptions sequentially using a code of I for interview, F for film and J for journal. For example, the first interview was *I-1, June 07*. I then started making notes in margins, these notes ranging from observations to possible themes that I started to see emerge.

Notes were then grouped together on the basis of similarity in content and then clustered together to form five "themes". My initial physical process of this was the use of five binders of varying color, placing notes in each binder. Within each of the five emerging themes, I repeated the process again clustering together for themes with a theme, for a completed total of seventeen themes. I dated and cataloged all data sources. As I clustered and catalogued, I formed a sense of irony that in process to examine Aboriginal knowledge, I used the WMS process of breaking down and classifying knowledge to do so. While I found it ironic, this may be the notion that Colorado (1988) brought forth, when she queried whether conducting research based on Western scientific methods may be to the detriment to one's Aboriginal worldviews.

The themes are described in Chapter Four, and are illustrated with sample quotes from interviews, films and journals. The quotes presented are the ones that exemplify the main idea of each theme.

CHAPTER FOUR: ANALYSIS

This chapter addresses the key research question: specifically to investigate whether using digital film in the documentation and reflection of Aboriginal knowledge with respect to science was a positive learning tool. The data through the films, weekly journals and project interviews presented a wide ranging scope of themes, which yielded the following five categories: Aboriginal knowledge; learning and knowledge transfer; capacity; sense of place and identity; and challenges and limitations. The research questions overlapped into all five themes that emerged.

The core component of the data and the underlying principle behind this research project was the production of student films based on Aboriginal knowledge and science. I will present brief descriptions of the ten films with their connections to the research questions. I have presented the student research questions which guided the student process. Using the class definition of science as "a way to understand the world around us", the films present a diverse scope in which to do so, one which may be a complement or a bridge of understanding between two worldviews. The ten films submitted into the data pool included:

***Language*, 2007**: an 11 minute documentary style film on the local Coast Salish language and its significance to the people of Beecher Bay and understanding the world around them. An example of Aboriginal knowledge transfer through understanding the natural world is presented in the film through community participant 4 as he relates his learning as a young boy from his grandmother:

> When I was a young baby, my grandmother used to take me and speak Ditidaht to me, and she would make me understand many things… she would take me 100 yards from our house, and she would say "*Klubasha klee asi* (phonetic), I want you to tell me what that tree does, and when you find out, come and tell me", so that was the beginning, I had to describe the leaves, the roots, and what they did, what birds sat in the tree, and which birds didn't, so I learned about nature first and I got to understand the world around me (Comm 4, 2007).

The student research question for this film was "How does a greater understanding of Aboriginal languages assist us in a greater understanding of the world?"

***Nuu-chah-nuulth Language*, 2007**: A 7 minute film on the Nuu-chah-nuulth language, its historical and present state and its significance to the filmmakers. The student research question for this film was very similar to the film above, with more of a focus on the Nuu-chah-nuulth language: "How does a greater understanding of our Nuu-chah-nuulth language assist us in a greater understanding of the world?"

These two films on language primarily examined the significance of language to AK, and the knowledge embedded within them. Knowledge embedded within language is connected to place, which aids in developing a greater understanding of the environment around us. Language is also seen as a vital strand of AK.

***The Moon*, 2007**: a 5 minute film on the moon, paralleling western science perspectives with a Nuu–chah–nuulth oral history of the thirteen phases (or faces) of the lunar cycle. Pairing the astronomical perspective of the lunar cycle with an Aboriginal perspective adds to the understanding of the moon. A FNGP student narrated Nuu-chah-nulth artist Tim Paul's analysis of the moon, one that influenced the artist considerably as he completed an entire collection of designs of its phases and lunar eclipses:

> The moon told of the arrival of food sources such as salmon and the size of crops, as well as weather conditions and other environmental information. This was linked to the respectful interaction between humans and the environment. Nature would often choose a course that was out of balance, and the human world would assist with that correction. For example, every now and then, the great spirit of the Ling Cod decides to swallow the moon. When this happens, I was told by my grandfather our people would line up on the beach and begin to sing to Nas, the creator, not to allow the moon to be swallowed by the spirit of Ling Cod. But if the moon was swallowed, our people would sing another song to Nas, asking the great Ling Cod to let the moon go. When the Ling Cod released the moon, our

> people would really sing and drum thanking the creator for hearing them and to the Ling Cod for letting the moon go (Paul, 1999, p. 31).

The student research question for this film was "How does an Aboriginal perspective of the moon aid us in developing a greater understanding of it?"

***Drugs and Alcohol*, 2007**: An 8 minute film interviewing Aboriginal youth on their perspectives on drugs and alcohol and its social, family and personal impact. The student research question or goal for this film was "To develop a greater understanding of the impact drugs and alcohol have on Aboriginal youth?"

***Pros and Cons of Marijuana Use*, 2007**: A 6 minute film investigating the pros (medicinal uses) and cons of marijuana use, including an interview with a medicinal marijuana user. The student research question or goal for this film was "To develop a greater understanding of the impacts of marijuana (in particular medicinal marijuana) has on Aboriginal youth?"

These two films on drugs and alcohol included extensive research on the effects and impact they have on the human body. The films are combinations of "facts" presented through a WMS lens and personal narratives from Aboriginal youth and community members. An example of this is a table produced presenting the benefits and the side effects of marijuana use, with respect to its use for medicinal purposes.

***Beecher Bay Cultural Event*, 2007**: A 5 minute Media Arts class documentary piece on a cultural day put on by the local Beecher Bay First Nation. It presents elder and chief teachings, Aboriginal 'places', feasting, traditional storytelling, singing and drumming. This film primarily examined the significance of place to AK and the environment. The "place" of significance in this film the Beecher Bay First Nation, a region rich in marine life and significance to the Beecher Bay First

Nation. Community participant 8 presents the significance of names and Aboriginal places, the challenges facing AK today and a sense of optimism for the future:

> There are reasons for the name and it is always tied to the land of where we are from. Everything we have comes from the land and from our people. Most of our people, our age and younger don't know all of this, they don't have knowledge of this because it was something that was taken away from us many years ago. It is starting to come back now though (Beecher Bay Community Event, Comm 8, 2007).

The research question for this film investigated "How does the opportunity to learn from an Aboriginal place in an experiential opportunity beneficial for students".

***Youth and the Environment,* 2006**: This film presents students and staff's reflections on their personal reflections of why it is important to take care of the environment. It pairs from a WMS perspective some of the many challenges and perils facing the Earth and environment today, and student and community perspectives on that matter. Youth explored ideas and beliefs related to ecosystems, pollution, environmental issues, the importance of place and how all things are inter-connected. The student research question for this film was "How does developing a greater understanding of, and developing a relationship with the environment benefit youth today?"

***Irwin Park Community Project*, 2006**: A Media Arts class documentary on a local park restoration project. This film examined the significance of place to AK and the environment, and the benefits of project based learning. The project is described as "designed to provide students with an alternative form of learning" (Irwin Park Community Project, 2006). The film presents numerous interviews, natural shots and documenting of the naturalization. Naturalization of the park took the form of removing invasive species removal such as broom and alder trees, and planting trees and plants in the park. Students and community members learned "hands on" about the natural environment at Irwin Park, including tree and plant classifications, and Irwin Park habitat

investigations. The local sea otter family prompted an interesting class lesson in Science class, whereas in First Nations Art class, an otter was created for placement at the park on the cedar siding of the informative centre. The research question which guided this film was "whether providing students with an alternative form of learning was a positive learning tool in developing a greater understanding of the environment?"

***Evolution of a People*, 2004**: A twenty-five minute film that is a powerful look at culture, history and the will to survive. It examines the views of contemporary Aboriginals queried on their perspectives on the significance of culture in their histories and today, the challenges facing their Aboriginal cultures and the significance of language and culture for their children and children yet unborn. This film primarily examines AK, its worldview and its knowledge transfer systems. The student research question for this film was "How has Aboriginal culture evolved throughout time, and how does a greater understanding of Aboriginal culture keep our people healthy and well?"

Seafood for Life, 2004: A six minute film on the importance of seafood for her community and culture. The film presented many variations of seafood as the Pacheedaht people harvested from the tide-pools of Botanical Beach. This film primarily examined the significance of place to AK and the environment. Student filmmaker FN 15 introduces herself and the film:

> I am from Pacheedaht, we are people of the seafoam, in Port Renfrew BC, which is along the west coast of Vancouver Island. This film shows some of the traditional foods we have gathered from Botanical beach, which includes mussels, slippers, rock stickers and sea urchins. (Seafood for Life, FN 15, 2004).

The student research question for this film was "How has the significance of seafood kept the people of Paccheedaht healthy and well?"

I will present findings presented through the data grouped into the face themes of Aboriginal knowledge; learning and knowledge transfer; capacity; sense of place and identity; and challenges and limitations.

Aboriginal Knowledge

The wide-ranging theme of Aboriginal knowledge (AK) generated four themes from the data pool. These included participants' beliefs or reflections on the concept of Aboriginal knowledge, AK and science, AK and language and AK formed through resilience and resistance. The data from this section presents students' understanding of Aboriginal knowledge and science.

Concept of Aboriginal Knowledge

The concept of AK and definitions of it were introduced in Chapter Two. The literature reviewed and my personal experiences presented AK as an all encompassing, value laden and living concept. Participant reflections and input reinforced, strengthened and I believe furthered a greater understanding of the concept of AK. Responses through a weekly journal submission, "Aboriginal knowledge to me is" produced the following responses:

> AK is about knowing your family, traditions and their beliefs (FN 18, 2007).
>
> Knowing your history, way of life (FN 8, 2008).
>
> Knowledge and teachings about our environment (FN 17, 2008).

These student responses presented AK as a body of knowledge, a pre-requisite for any knowledge system. AK was expanded upon when the concept of relationship and AK were introduced. Relationship is a key term, developing AK as more than a body of knowledge, but a living concept:

> How all these different things relate to each other, there is a relationship, a very delicate relationship. So if you harm one thing, it is actually like a pebble falling in a puddle, like a ripple effect that can happen in this delicate fabric of life (FN 11, 2007).
>
> There is a deep sense of respect in our Obijway culture for our relationship to the world around us (FN 11, 2007).

Demonstrating respect in a reciprocal manner was presented as examples on how to form a relationship with the environment. This furthered the concept of relationship with respect to AK:

> There is a ceremony before we take a tree, you can't just go down and cut a tree, you have a lot of praying … fasting and being one with the earth, you can't just take something because it doesn't belong to us (Staff 3, 2007).
>
> Don't just save the woods for us humans, there are plants and animals, it is their home too (Irwin Park Community Project, FN 19, 2007).

These two responses demonstrate concepts of AK that diverge significantly from that of a Western perspective. Spirituality is introduced through the concept of praying and fasting, of demonstrating respect for the environment before the use of the tree. Ownership is presented through "It doesn't belong to us". The logging industry clearly believes in the concept of ownership through their past and continued logging practices. The second quotation presents a world where humans are not at the top of the hierarchy, but live in conjunction and in relation with the plants and animals.

"We are all important here on Earth, we all have to take care of it" (Beecher Bay, Comm 9, 2007), demonstrates a key concept of AK that recognizes the contributions of all people. Aboriginal knowledge has existed from the beginning of time (FN 15, 2007) and has passed through the generations to the children:

> When the creator put us on the Earth, he put us on the Earth because we all had something to share, every single one of us had something to share, none any better or worse, … and as responsible people from our culture, we need to pass it onto our children (Evolution of a People, Comm 18, 2004).

The quote above reflects the significance of children in AK. Whereas knowledge transfer to our children seems obvious in any knowledge system, the importance of children is foremost in AK:

> With the birth of my daughters, I recognized and realized the responsibility to keep our Aboriginal ways of knowing alive (Staff 4, 2007).

> If we didn't honor our children, our culture would die, who we are, our very existence would cease, that's why children are the most important thing in our culture. We have huge ceremonies, and give away all of our belongings to honor our children (Evolution of a People, Comm 15, 2004).

> It is for the children and the children yet unborn, that is essentially what the culture is for (Evolution of a People, Comm 17, 2004).

Understanding of Aboriginal knowledge is accurately described as a "big job, a lifetime of a job" (Evolution of a People, Comm 19, 2004). This research project presented findings of AK as a knowledge system that included a knowledge base, a knowledge system that forms relationships with the world around us, a knowledge system that demonstrates these relationships in a respectful and reciprocal manner, and a knowledge system that requires us to take the responsibility to pass this on to our children.

Aboriginal Knowledge and Science

The seemingly divergent themes of AK and Western modern science (WMS) provided the background for the rationale of the research project. The FNGP is a school of choice for Aboriginal students 16 and over. As such, the students generally come from two groups: adults returning to school or younger students in the sixteen – nineteen age range that did not experience success in 'regular' school. As presented in chapter three, teacher led class discussions led to a definition of

science as an “organized way to understand the world around us”. I hoped to keep the definition as generic as possible in order to foster an understanding of a relationship with AK. However, it was evident that in the weekly journals, samples of student responses to the prompt “Science as I know it is” demonstrated a limited knowledge of WMS.:

> Chemistry and inventions (FN 6, 2007).
>
> Where I learn about some cool stuff (FN 1, 2007).
>
> Actions and behaviors of the natural world (FN 14, 2007).

There were student responses that presented science as a body of knowledge:

> A body of knowledge and rules about that body (FN 2, 2007).

There were student responses that grasped the concept of the scientific method:

> Learning to identify the problem, and learning about what is needed to come to a conclusion (FN 17, 2007).
>
> A series of processes that figure out questions to explain the world as we know it (FN 10, 2007).

There were student responses that presented a broader concept of the definition of science:

> Science to me is a way to learn about everything (FN 5, 2007).
>
> Learning about how the world works (FN 8, 2007).

These four sets of comments demonstrate the students’ knowledge of science moves from initial responses such as science is “blowing stuff up” (FN 10, 2007) to understanding how the world works. It probes one to question if there is another way of understanding the world other than WMS. The relationships furthered through AK as a way to understand the world may provide a fuller understanding than the classification of knowledge and subjects offered through WMS.

If we were to implement aspects of AK as a format for a greater understanding of the world around us, the environment and the AK it contains seemed a natural starting point. Responses to the post project interview question, "What are local examples of Aboriginal knowledge as it relates to science?" yielded the following responses:

> Knowing the environment around us: hunting, fishing, use of cedar. Cedar is a big part of our Nuu-chah-nulth people for housing, clothing, transportation. Our people used plants for medicine (Staff 3, 2007).

> Well definitely ethno-botany, people who use plants whether it is for foods, medicine or clothing (Staff 2, 2007).

Whereas there were contributions that presented Aboriginal contributions to science, we must be careful heeding Cajete's words, "The fact is that Indigenous people are, they do exist and do not need an external measure to validate their existence in the world." (Cajete, 1999, p. 81, 82) That is, we do not need to evaluate our Aboriginal knowledge systems by the criteria set by WMS.

An integral factor and component of this research project is the nexus that exists between AK and WMS. The concept of AK demonstrated that the research participants had a broad understanding of concepts and components of AK. The question is whether the world around us is prepared to understand the world around us further than WMS which uses the lens of the scientific method to do so. The staff member (non – Aboriginal) below believes that there is a strong AK – WMS connection:

> AK has a higher inter-connectedness, a philosophy of inter-connectedness. The speakers in the Aboriginal community use this philosophy to guide them to connect them to the world around us, whether it is reference words for the oceans, the forests, the land or the animals. So there is a huge connection to science, to try to understand the world around us (Staff 1, 2007).

Thus, if the lens of AK can assist us to understand the world, to form respectful, reciprocal relationships with the environment around us; it should be explored as a complementary worldview to WMS.

Aboriginal Knowledge and Language

The significance of language and AK cannot be overstated. This is reflected through student reflections "language is a big part of AK", and "it is something that is very sacred to my family" (FN 8, 2007). It is also evident through the number of student films submitted into the data pool, two of which (Language and Nuu-chah-nuulth Language) whose topic is Aboriginal languages, while a third film (Evolution of a People) imparts language as a central theme to the film.

In Chapter One, the current epidemic facing Aboriginal languages was introduced, including the statistics:

- 80% of North American Native languages are moribund,
- Over the next century, 2 languages will die each month,
- A quarter of the world's languages are spoken by fewer than 1000 people (each),
- Over 90% of the world's languages may be extinct in the next century (Cantoni, 1996).

These statistics are further strengthened through the powerful reflection by a community participant 17 in the film, "Evolution of a People":

> For thousands of years, and thousands of generations, people have been speaking our language, and I think there are 350 speakers left. So if you think about it, an analogy you can use is an animal becoming extinct, the language is almost the same. The language has been around since the beginning of time, our beginnings and we are now down to our last 350 speakers, that's really scary (Evolution of a People, Comm 17, 2004).

The above statistics and quotation clearly presents an unhealthy current plight of Aboriginal languages in Canada. Without being too cynical and moving beyond friendly thoughts of "it would be nice", why is language so critical to AK? In chapter one, I drew upon my own heritage, of being Kwakwaka'wakw which translates to Kwakwala speaking peoples. The language is not a part of us as a people. It is who we are as a people. Community participant 17 enforces the necessity of language to AK through:

> It's all well and good to read books, to listen to tapes, and to know how to sing, and to know how to dance. You can attain an understanding of your culture through that. But you need our language to have a true understanding of it…So language is real, real important, it is absolutely essential (Evolution of a People, Comm 17, 2004).

There are numerous reasons validating the significance of language to AK and rationale to keep it alive. I will examine two, the first being the knowledge embedded into Aboriginal languages, the second I will present later, that being the significance of Aboriginal language and sense of place.

Knowledge is embedded into language. Specifically, knowledge of nature and the local environments is embedded into language. Community participant 18 forcefully addresses this through:

> The fact that we look to nature for its answers, and we find them there, they have always been there, they are all there, they have always been there. And as we separate from our language, we separate from nature (Evolution of a People, Comm 18, 2004).

"As we separate from our language, we separate from nature" (Comm 18, 2004). This statement unequivocally connects Aboriginal languages to nature. A connection to nature or the environment connects to a WMS worldview of systematically understanding the world around us. WMS, through its discrete disciplines such as Physics and Biology has a distinct language of its

own. Being able to recall the vast terminology is often an indicator of knowledge, particularly in the subjects such as Biology so rich in vocabulary. Thus, the knowledge embedded within our Aboriginal languages aids us in understanding our environment, of understanding the world around us.

In chapter one, I looked at the present science education system and it's failings with respect to our relationship with our environment. Increasing understanding of Aboriginal languages may address that failing relationship in a positive manner.

Aboriginal Knowledge and Resilience and Resistance

Resilience and resistance are traits that have allowed AK to survive to this present day, being such a powerful factor that it should be considered a vital component of AK. The two devastating aspects of the Indian Act, the Residential schools and the anti-potlatch law were two themes that emerged as undeniable components of our Aboriginal history in Canada. One of the damaging outcomes from this was the loss of Aboriginal languages. It was however also clear that a sense of resilience, a sense of triumph of survival became apparent as the sheer fact that as Aboriginal peoples, we are still here.

Community participant 17 credits the resilience of our ancestors through:

> We are very fortunate that a number of our old people who said no, and saw it as important enough to keep alive, and because of them, we are able to do what we do today (Evolution of a People, Comm 17, 2004).

Community participant 17 speaks of going underground in reference to his ancestors continuing their cultural ways, in spite of the anti–potlatch law. He further explains the effects of the anti-potlatch law legislation (1884-1951) through:

> Sometimes they take the camera on the street, sometimes the opinion is given, well how long, how long are we supposed to pay for stuff that happened a long time ago? And I always think that because of what took place between 1884 – 1951, that anti-potlatch law and all the stuff that went on, a lot of our people don't speak our language, so to hear people say "how long are we supposed to pay for stuff that happened a long time ago?", when a language is gone, it is gone forever, so our people will pay forever. (Evolution of a People, Comm 17, 2004).

An elder who went to residential school clearly demonstrates her resilience, and her will to survive as she recalls her experiences on camera in the film, "Nuu-chah-nulth Language":

> I got kicked out of school for speaking my language, she told me I could not come back until I apologize. I never did… one time in Duncan, I saw her at a conference and she said "Community 4, you still owe me an apology". After thirty years, I said "No, I don't" and I never intended to apologize for something that was rightfully mine (Nuu-chah-nulth language, Comm 7 2007).

In 1931, Duncan Campbell Scott, then Deputy Superintendent General of Indian Affairs, expressed his view concerning the inevitability of Indian assimilation with these words:

> The Government will in time reach the end of its responsibilities as the Indians progress into civilization and finally disappear as a separate and distinct people, not by race extinction but by gradual assimilation with their fellow citizens. (Scott, 1931).

Scott furthered that the residential schools were the direct route to addressing this policy of assimilation:

> I want to get rid of the Indian problem. I do not think as a matter of fact, that the country ought to continuously protect a class of people who are able to stand alone… Our objective is to continue until there is not a single Indian in Canada that has not been absorbed into the body politic and there is no Indian question, and no Indian Department, that is the whole object of this Bill (Scott, 1931).

Community participant 15 shares her story on the drastic effects of the Residential schools:

> People were put into Residential schools and they were made to feel guilty, made to feel ashamed of who we are. A lot of people who went to Residential schools didn't want to be Indian, they did everything in their power not to be Indian, not to be who we are (Evolution of a People, Comm 15, 2004).

Thus, the will to survive in the face of such adversity forms an integral component of an Aboriginal knowledge system. This resilience comes with a price, the task of responsibility:

> It is important to do things the way they are supposed to be done, to honor those people who suffered back in those days (Evolution of a People, Comm 17, 2004).

This resilience and resistance has also formed optimism by the fact that we have survived is a clear indicator that our Aboriginal peoples and our knowledge systems will continue for our generations to come:

> It is my hope that with the revival coming, with everybody's interest coming back to our culture and our roots, and realizing the importance of it, we grow strong again. It might not be what it was before, but it will definitely come to a point where the government is never, ever going to get rid of us, the way we are (Evolution of a People, Comm 15, 2004).

Resilience and resistance are traits of AK as it is an undeniable fact that our ancestors suffered and the lingering effect of those sufferings has a dramatic impact today. The benefits of the digital film research and class projects are that it allowed these community members an invaluable medium to share their stories. The ability to allow our community members to share their stories is a validation of knowledge, allowing our students to confirm that the stories of their families are important and valid in their schooling. Resilience and resistance are traits of AK by the simple fact that as Aboriginal peoples, we and our knowledge systems are still here.

The films presented a diverse investigation aiding to the understanding of our world, primarily through the lens of AK. By presenting a complementary perspective of understanding our world, the research project aimed to be a bridge of understanding between AK and WMS worldviews.

To summarize, this section used the notion that the lens of AK can assist us understand the world, as a complementary worldview to WMS. To do so, we first looked at what we presently knew of AK and how this research project added to our understanding of it. Aboriginal languages

were investigated and their essential significance to AK was confirmed through the research. The final concept of resilience and its connection to AK was introduced, the simple fact here being: had our ancestors not displayed this resilience, this knowledge system may have been lost and the initial notion brought forward at the beginning of this paragraph an opportunity missed.

Learning and Knowledge Transfer

Learning and knowledge transfer (KT) is the second major theme to be presented. Interwoven within this theme are several overlapping themes in other themes, most notably Aboriginal knowledge. That is, for AK to continue, the knowledge must be transferred to the next generations. I will examine four broad concepts within this theme: learning through knowledge transfer; learning by doing; learning through a new technology; and the concept of learning itself.

Learning through Knowledge Transfer

The resilience of our Aboriginal populations to keep their ways of knowing alive was facilitated through a distinct knowledge transfer system. Community participant 14 succinctly articulates the primary concept of the knowledge transfer system as being an oral knowledge transfer, "Everything that I learned today is oral" (Evolution of a People, Comm 14, 2004). The oral knowledge transfer system is a dynamic learning system, one which our Aboriginal ways of knowing are based. Aboriginal cultural ceremonies are often marked through giveaways to persons in attendance. These gifts are not only acknowledgements of recognition for attendance, but more so for accepting the responsibility of remembering what you witnessed. This responsibility is then transferred orally through the generations.

Community participant 14 furthers some of the differences through an Aboriginal knowledge transfer system and the text dominated through a western perspective:

> …there is a big difference. You cannot just rip a page out of a book and go by that. Like if you pick up a book from 1940, and you say that name was given to somebody. The problem is now, that name has been given to someone else (Evolution of a People, Comm 14, 2004).

The fluidity and dynamic nature of knowledge is touched upon; what may have been written in 1940 may not accurately reflect what is reflected upon presently. The oral traditions are passed through storytelling, creation stories, family stories and the singing of songs (FN 14, 2007). Community participant 14 presents aspects of the oral traditions where he specifies oral traditions as learned songs, dances and protocol (Comm 14, 2007).

The notion or concept of responsibility to transfer knowledge and its fluidity as a dynamic knowledge transfer system are explained through community participant 14:

> It never belonged to me, it was something that was passed down, and it was left there for someone to pick up. Anything you learn today doesn't belong to you, you just learn as much as you can and give that to the next generation (Evolution of a People, Comm 14, 2004).

The idea that knowledge doesn't belong to you is significantly distinct from a western perspective that patents ideas and catch-phrases. It should be noted that components of the oral traditions such as songs and dances do have distinct family ownerships. Community participant 14 asserts on the significance to AK ways of knowing as a way of life through:

> My teachers are still alive, when they pass away, my teachings are finished, then I take over and start to be the teacher… I am still learning, learning until the day I die (Evolution of a People, Comm 14, 2004).

Aboriginal knowledge and learning that is passed through the generations orally is a well known truth, with some of its implications discussed above. Aboriginal knowledge as a social responsibility was an interesting assertion through community participant 18:

> People need to lift each other up, that's what the old people used to say. Nobody talks about that any more, and that's something we all need to talk about, and every chance I get to talk about lifting each other up, I do, and the most important people to teach is our young people (Evolution of a People, Comm 18, 2004).

Dlu'gwala is a Kwakwala phrase for 'lifting each other up", a phrase commonplace in the songs of the Kwakwaka'wakw. As the phrase is sung, the dancers on the floor will move their hands in a cradling fashion, simulating lifting or carrying of something. The importance of social responsibility, of community relationships is passed orally and demonstrated through song and dance. In the quote above, Community participant 18 laments on the declining notion of Dlu'gwala, of lifting each other up, a common theme representative of the state of present AK.

Community participant 18 also brings forward children in the notion of learning and KT, a consistent concept within Aboriginal ways of knowing. Children and their importance to the continued existence of Aboriginal peoples is a paramount theme within learning and KT. Community participant 14 and 15 relay the importance of children and the responsibility we face to ensure that AK is transferred to our next generations:

> My responsibility to make sure our kids understand who they are and where they come from…our roots are in Kingcome, my job is to help the kids in Victoria to understand where they come from (Evolution of a People, Comm 14, 2004).

> The key is for our children to learn our language and dances, our art, our way of life and bring that connection to our own territories, the lands that were ours from the beginning of time… the biggest thing is to teach our children (Evolution of a People, Comm 15, 2004).

Compulsory components of KT to our children are the Aboriginal elders who pass that knowledge onto our children. KT is a responsibility, of "passing to my son what I have been taught by my grandparents" (Staff 3, 2007). Responses to the question, "who did you interview and why?" led to responses:

> I interviewed my grandma, she knows a lot about it (AK) and she grew up knowing it (FN 8, 2007).
>
> Interviewing my elders, she was part of my video, and she told us how she learned her language (FN 1, 2007).

The simple notion of asking your elders, your grandparents' questions on AK is an overwhelmingly positive outcome of this research project and projects of like manner. Too often today, our youth seek their knowledge in mediums not congruent with Aboriginal ways of knowing. These are more in line with a Western pedagogy, the textbook, the internet, the library, all sharing the theme of the written form. Sitting with our elders is reduced to coffee table chat, the knowledge that they possess seemingly not important in today's world. However, having students ask their elders questions with respect to AK may assist in re-igniting that knowledge transfer system. The project would formalize a KT between youth and elder, would validate the knowledge our elders possess, and would act as an invaluable archive of knowledge.

> Video is a great tool for learning, maybe an elder who hasn't been sought out by any community members, or never thought that the knowledge that they held was sacred, sharing what you know is important. It lights a fire, bringing alive that AK and applying it to one's life. (FN 11, 2007).
>
> It is a catalyst to re-ignite or to continue our KT systems or our ways of knowing (Staff 4, 2007).

In this section, I presented Aboriginal knowledge and learning and explored the oral knowledge transfer system of Aboriginal peoples, and its distinct differences with a western KT system. It also reflected upon the importance of children in Aboriginal KT system and demonstrated through this quote, "that's why children are the most important thing in our culture" (Evolution of a People, Comm 15, 2004). The significance of elders to an Aboriginal KT system was presented and the hope that the use of digital film may address and re-ignite a formal and traditional knowledge transfer system.

Learning by Doing

This research project touched upon the theme of *learning by doing* as an integral component of its delivery and how learning by doing is another vital strand of an Aboriginal knowledge transfer system. Cajete asserted that "experiential learning is the most basic and holistic type of human learning" (Cajete,1999, p. 55). This research project allowed students to produce films on topics of their own choice, thus by engaging in experiential learning, they are learning by doing. Learning by doing is a key concept of the PAR methodology employed in this research project. The initial step in the research project is allowing students to choose a topic of their choice to create a film on (with respect to AK and science). A project topic relevant to the students is a key starting place. A Westshore staff member outlined this concept through:

> Key in doing video is letting the student, providing a way for the student to choose their topic. That interest is going to really carry them throughout the whole project (Staff 1, 2007).

Student participants confirmed this through their interview responses:

> I seem to be able to learn more, when I do some research when something interests me (FF1, 2007).

Student participants also enjoyed the free will to choose a topic of their choice:

> The teacher allowed us to work on whatever we felt comfortable with … so that is what I liked about working on the video (FF3, 2007).

> I am producing it the way I want to (FN 10, 2007).

The process of creating films generally works well with project based learning. The Irwin Park project was an example of this, wherein Westshore students from the Fast Forward and First Nations programs partnered with community partners Rotary, UVIc graduate students and the city of Langford in a weekly park restoration project. The weekly restoration project created a natural setting for a class documentary. It was evident that field based experiential learning opportunities

provided a more stimulating documentary than one based in a typical classroom learning environment. Students in the Irwin Park Community Project film believed:

> I like working outdoors, planting trees, learning more about using the video camera (FF 5, 2006).
>
> I like working here, it is a relaxed atmosphere, everybody works together, gets along and we all work as a team (FF 6, 2006).
>
> I like working out here, and being that it is a part of school, it makes it more fun, a little more interesting knowing that every Friday, and I get to go with everybody from my class and work in the park (FF 1, 2006).

The 'hands on' approach to learning was recognized by student participants as a critical component to the research project:

> I find that for us to take that knowledge and actually do the hands-on work in the park, and put it on the computer in DVD form, it is almost like reaffirming what they learned in the park (FN 11, 2007).
>
> The hands-on approach was great, and that is sort of how I learn (FF 1, 2007).
>
> When you take the oral traditions of the First Nations people and work with the hands on approach, it works very well (FN 11, 2007).

Learning by doing or experiential learning was a key component of this research project. It starts with allowing the students the flexibility to choose a topic of their choice, of providing opportunities for students to participate and film interesting class and experiential projects, and allowing the students the opportunity to learn in a hands on approach. It is clear that all of these components are positive traits of the use of PAR methodologies. Finally, many students enjoyed this form of learning in deference to writing a written assignment as:

> It was more fun, didn't have to do as much work as on paper (FN 2, 2007).
>
> It was better than writing an essay (FN 6, 2007).

Learning and Digital Technology

Learning through the creation of digital films introduces many concepts to the learning environment: it introduces a new medium to learning, it provides an opportunity to present an objective message to a wide audience, and proves to be an excellent tool to transfer and archive knowledge.

"Another way of expressing what they are learning" (Staff1, 2007) is a driving force in the use of digital film and learning. It has "introduced a new medium, other than pen and paper, then I get to use a camera and film, it made it so much better" (FN 10, 2007). Students are well versed in the multitude of technological devices available today, from the digital camcorder used to capture the footage to the computer software used to create the films. People learn in a variety of methods, a student participant in this project professed:

> It helps because most people learn in different ways, and videos can be quite funny and catch people's eyes… I think that using video is better because most people learn more visually than anything (FN 10, 2007).

In today's information technology world, the transfer of knowledge is measured in speed, in bytes of information per second. People now may "not have the patience to sit down and read two textbooks, for instance on language and feel the need to translate it, when you can watch a video and have it come straightforward right at you" (FN 14, 2007). The transfer of knowledge through a digital film is notably faster than the written text.

In the process of expressing what they are learning, the students are offered ample opportunities to "examine and re-examine their footage" to ask themselves "does this sound reasonable?" (FN 11, 2007). Media arts instructor Staff 1 discusses the objective learning opportunities provided by digital film:

> You really have to stand in a neutral ground, to weigh the pros and cons about what your message is going to say. There is a continual consideration of your ideas… the students will be able to go into so many rounds living with the idea and finding ways to express these ideas to each other. It is a phenomenal, a phenomenal was because it is very neutral. (Staff 1, 2007).

A student participant offers his concurring thoughts on the process of filmmaking:

> I just kind of try to make it flow right and tell people what I see, and try to keep it a neutral opinion so people can make up their own minds (FF 1, 2007).

The use of digital film is "a new form of storytelling" (FN 14, 2007) succinctly and powerfully demonstrates the strength of the medium of film. The advent of the affordable hand held digital camcorder and available software has allowed the opportunity for our youth to become storytellers. The ten films made by the youth in this research project focused on Aboriginal knowledge. It is clear the use of film is a powerful tool for the transfer of Aboriginal knowledge. In the 1930's, the Kwakwaka'wakw recorded many of our songs on tape. Today, we are still learning and using those songs in our cultural practices. Our ancestors had the foresight to archive it, it seems simple; archive knowledge so our generations to come will have the opportunity to learn from them. Our student participants today have the opportunity to "transfer that knowledge onto a DVD format, which can be shared with their families or communities" (FN11, 2007). The oral traditions of our Aboriginal peoples is an ideal form of knowledge to transfer through the digital form; "you can hear it, you can see it, the sound of the language … and you can transport it and show a lot of people very easily" (Staff1, 2007).

The ability to disseminate the films to a wide audience is a beneficial factor in the learning process. Not only have the students learned throughout their personal process of creating the films, the audience reacts to their film. I have personally seen the film "Evolution of a People"

innumerable times, and feel that I have learned something new each time. Media Arts instructor Staff 1 adds:

> There is a reaching out, of connecting with a larger community, you can see how your message or how your video can affect people in the audience, to see if they are making any connections about how the audience is reacting to their piece, they will then come up with new learning, … it is a learning cycle (Staff 1, 2007).

The modern technology offered in this project is "what more and more people are turning to, to do research, to work on assignments" (FN14, 2007). It can be a powerful tool, "because once it is finished, it can go to a huge audience where the message is another part of the learning process" (Staff 1, 2007). The use of digital film presents an effective learning tool, one which our technologically capable youth are well versed in, where the process of creating the films enhances the learning and one which is an effective tool to transfer AK to a wide audience. To summarize and to re-quote a student participant, "it is a new form of storytelling" (FN 14, 2007).

The Learning Process

Learning is defined as "the act or process of acquiring knowledge" (Merriam and Webster, 2008). I have presented in this section how this research project facilitated acquiring and transferring of knowledge, specifically Aboriginal knowledge, and how this research project facilitated acquiring knowledge through learning by doing, and through learning via digital film technology.

Students working on films on Aboriginal languages "have a reason to ask questions, a reason to videotape and record the audio" (Staff 1, 2007). The process acts as a catalyst for learning, particularly on subjects of AK. Once the students have filmed the raw footage, there is a lengthy

process of viewing, transferring and editing the footage. This process involves the students in different forms of learning:

> They will take these tapes and listen to them again and again, so at the very basic level, there is repetition going on. I think that some of those repetitions help the learner really engage with the thinking that goes on, with the knowledge building, they are more aware of their learning (Staff 1, 2007).

Thus, the three research stages introduced in Chapter Three of development, implementation and evaluation themselves facilitate the process of learning. Staff 1 furthers:

> The process of creating something that you are able to find your own ideas, your feelings, your decision making, your camera work, your own editing, your own special effects, your own ideas about who and where you want to get the information, do your own research and then put it all together into some form of a final piece, which could take the shape of many forms, and have it say what you have been learning, to me, that is the process of learning (Staff1, 2007).

The process of learning, guided through the three development stages was a concept staff and students were able to experience and reflect upon within this project. Student and staff reflections on the process of learning provided some intriguing and compelling concepts:

> KT is a living concept (Staff 1, 2007).

> With filmmaking and learning about a different topic, to me is not living the same day twice (FN 11, 2007).

> You need to paint a good picture for people to see (FF 1, 2007).

> It (producing films) makes school a lot of fun, it also brings a lot of respect (FN 12, 2007).

The process of creating digital films mirrored the process of learning, the process of acquiring knowledge. It was furthered that the process of creating films not only mirrored the process of learning, but that at its fundamental steps, it was the process of learning. It is this exciting process that Ohler describes as an important pedagogical frontier (Ohler, 2008).

Sense of Place and Identity

In Chapter Two, a sense of place was identified as being a strong component of developing a sustainable reciprocal relationship with one's local environment, whereas a sense of place and belonging in school was a strong component in inspiring Aboriginal students to become successful in school. A sense of identity, strongly connected to a sense of place was a concept that our Aboriginal students all face and often struggle with. This research project provided our students an avenue to communicate, to present and share their stories through the use of digital videos to that develops a sense of personal identity, develops a sense of pride, of locating our place in the world.

Three themes emerged under the broad topic of sense of place and identity: Our Aboriginal story, a sense of place from an Aboriginal perspective, and a contemporary sense of place and identity.

Our Aboriginal Story

Our story presents some of the struggles that Aboriginal peoples have faced in their history and how this impacts our communities today. It has been touched upon the adversity that the Aboriginal communities face and the subsequent challenges they may face at school. Aboriginal participants reinforced this concept:

> The abuse that I endured at home had a big impact on the way that I performed at school, I didn't complete school (FN 11, 2006).
>
> I am a child of the foster care system; I have been to 10 different high schools in the past seventeen years (FN 21, 2006).
>
> The first time I left school was to participate in my cultural and traditional activities; the second time I needed to support my baby (Comm 11, 2006).

The students at the Westshore Annex also expressed the challenges they faced in school:

> I didn't have a lot of problems with my teachers going through high school, but when you don't learn like the majority, you kind of slip through the cracks, and school is not set up for people who learn different (FF 1, 2006).
>
> When I went to high school, it was just the same old – same old, like the same teacher just doing the same stuff everyday, and that just wasn't for me (FN 22, 2006).

It is from this diverse pool that the majority of our student participants originated. The diversity of the FNGP and FF students from the Westshore Annex ensures that all students are unique and provided a rich data source for this research project.

The adversity that these students faced in school has some if its origins from the legislations of the Indian Act, including the Residential schools and the anti-potlatch law. The lingering effects of contact and the subsequent legislations still have devastating effects on our communities today.

> Our people have gone through stages. Before contact, we were a proud, proud people, we knew who we were, we had no questions. After contact, our people were put into residential schools, and made to feel guilty. Both my parents were fluent speaker, and they grew up, that's all they knew was our language, but after residential school, you know it was beaten out of them, they never spoke it to us (Evolution of a People, Comm 15, 2004).

The Residential schools and the anti-potlatch law were two over-powering legislative acts that had profound social implications. Community participant 16 clearly outlines some of the negative impact resulting from a loss of cultural identity:

> The most drastic changes are the fact that most of our people don't have that cultural identity, and because of that, they don't really know who they are or how they fit into the whole scheme of things, and because of that, they tend to be a bit lost, and in terms of getting into alcohol and all other types of things that you can get into when you are lost (Evolution of a People, Comm 16, 2004).

Thus, our populations that do not have that strong sense of cultural identity, who are 'lost' may have a greater chance to fall victim to social ills. A sense of place and its impact is illustrated in this telling personification by community participant 15:

> The tree of life represents a human being, its roots belong here, once that tree is taken out of its roots and taken away, it is not going to live very long, it is not going to be a healthy tree as long as it lives, and that is what happening to our people (Evolution of a People, Comm 16, 2004).

It is interesting to note that community participant 15's analogy of a healthy tree mirrors that both of Colorado (1988) who believed our people needed solid and strong roots in order to be healthy, and the Aboriginal Learning Knowledge Centre (2009) who used the tree as their model for their Holistic model of lifelong learning for First Nations.

The reciprocal concepts of sense of place and identity are presented, of our Aboriginal populations not connected to a sense of place being disconnected to their Aboriginal self identity. This sense of disconnect may bring feelings of being lost and the social ills that are often associated with being lost.

The sense of being lost is reflected in the fact that Aboriginal youth have a suicide rate five to seven times the national average (Health Canada, 2009). Student participants in this research project poignantly describe their struggles in life today:

> At first , I started drinking because I thought it would be fun, but once I started losing people, I lost two uncles, my dad, my friends, I just started drinking to get the pain away (Drugs and Alcohol, FN 4, 2007).

> I swear this whole world is corrupted by alcohol, it is just corruption, it keeps running through their kids to their kids to their kids and to their kids, it just carries on and nobody stops or tries to stop or nobody realizes what they are doing (Drugs and Alcohol, FN 5, 2007).

These two reflections above clearly present some of the social struggles that our Aboriginal youth face today. It should also be noted that these students also presented some very telling insights in their journal reflections that begin with the prompt "I want to make a film on my topic because":

> To reduce the use of drug and alcohol use in our community, and to touch the hearts of our families that are going through problems with drugs and alcohol (FN 5, 2007).
>
> I wanted to know why I started. I wanted to know why some people rather drink and do drugs than spend time with family or go to movies (FN 4, 2007).

It is hoped that our people will "come back to their roots and grow stronger, developing a stronger sense of self identity" (Evolution of a People, Comm 16, 2004). Our students, families and communities need to re-connect to that strong sense of sense of place, of cultural self identity in order to survive today and accept the responsibility to pass our AK to generations to come.

Sense of Place and Identity from an Aboriginal perspective

A sense of place and identity from an Aboriginal perspective demonstrated the clear role that culture plays in a sense of identity. In the film, "Evolution of a People", student filmmaker FN 14 queried Kwakwaka'wakw members of Alert Bay on questions such as: "How has culture affected you?"

> If I didn't have any cultural background, I would probably … feeling that I have a sense of…. I would seem like I was a bit lost, so how has it affected me, I know who I am and where I come from, and this makes me proud. (Evolution of a People, Comm 16, 2004).
>
> It is pretty much the base of who I am, I don't think I would have survived in this world if I didn't have my culture. It dictates the core of me, the core of my children, it dictates how I treat other people, how I conduct myself wherever I am, no matter where I am, who I am with, I will always be Kwakwaka'wakw. (Evolution of a People, Comm 15, 2004).

The strong messages provided above by community member's participation in the film provide positive affirmations of identity for all involved. Community members are allowed an avenue to assert their voice, and communicate their knowledge. Student's self-affirmation through project involvement resolves in self pride. Aboriginal culture adds strength to one's sense of identity, "AK is important to me because it keeps me healthy and strong" (FN 1, 2007). Community participant 4 furthers" that my heart is strong, because I know what I am talking about when we return back to our roots" (Language, Comm 4, 2007).

The importance of children is reinforced with their importance in a sense of Aboriginal identity. Community participants communicate the importance of children and an Aboriginal sense of identity:

> I think that is crucial that our younger people learn about who they are. I think that the more that you can become involved in the culture, the more you can understand about yourself, what your whole reason for being here is (Evolution of a People, Comm 16, 2004).

> It is most important for our children to know their roots, their ancestors, our teachings, our morals, everything, even more so now because there is so much influence from Western ways, and I think if we lose that, we will be in a lot of trouble, our children will be lost, maybe they will be the generation to be assimilated (Evolution of a People, Comm 15, 2004).

If our children are not exposed to our Aboriginal ways of knowing, and the importance of our teachings not stressed; the fear is that they become lost, and may be the generation that is assimilated. The very existence of who we are as Aboriginal peoples and the knowledge base and worldviews that accompany them may be lost. There is a sense of optimism however, the importance of our ways of knowing is stressed, our cultural practices are alive. Community participant 15 imparts:

> In the last 10 years, there has been a huge revival, people are realizing the importance of our culture. It is not just entertainment, it is literally who we are (Evolution of a People, Comm 15, 2004).

In a circular manner, if AK adds to one's sense of identity, research participants noted that a sense of place is AK. To the interview question, "A sense of place to me is", participants noted that:

> I guess it is culture, where I am from (Comm 14, 2007).

> A sense of place is belonging, practicing your culture, learning your language, I think that if you know all that, you have a sense of place, you know what your purpose is (Staff 3, 2007).

The circular or interconnected notion of AK is further demonstrated when participants turned around the above notion that, a sense of place is AK, to AK is a sense of place. "Aboriginal knowledge is where I come from, it is cultural" (Comm 14, 2007). Student participant FN 16 in her journal reflection adds, "Aboriginal knowledge to me is respect of who you are, and where you come from" (FN 16, 2007).

Two films entered into the data pool, "Beecher Bay Cultural Event", and "Seafood for Life", clearly acknowledge the direct relation that AK is directly related to place. In "Seafood for Life", student filmmaker FN 15 introduces herself with her Aboriginal name, her parents and concludes "I am from Pacheedaht, people of the seafoam" (FN 14, Seafood for Life, 2004). The seven minute film is a simple, yet poignant look at her and her family collecting seafood from the beach, their 'supermarket' and gathering together for a dinner. It acknowledges their connection to their local environment, collecting seafood as their ancestors have always done. The "Beecher Bay Cultural Event" is a 5 minute documentary where a local First Nation hosts SD 62 students for a day of learning, sharing, feasting and drumming at their local community. "There are reasons for names given, they are always connected to the land" (Beecher Bay Cultural event, Comm 8, 2007). The place itself was a huge component of the learning on the day, the significance of the location was

explained by local elders to the students. The "site provided an experiential exercise in education" (Staff 1, 2007) for the students involved.

A sense of place and identity from an Aboriginal perspective demonstrates some underlying principles and the interconnected nature of AK. The notion that AK strengthens one's sense of identity is a key theme to emerge from this research project. It is expected that students with a stronger sense of self identity will possess a greater desire for success in school and life. That knowledge is based in place is an underlying principle of AK. Conversely, a sense of place to many participants was AK. AK is the underlying theme that interconnects an Aboriginal perspective of sense of place and identity. Terms well known to Aboriginal communities, who you are and where you are from are the Aboriginal parallels to a sense of identity and sense of place.

A Contemporary Sense of Place and Identity

A contemporary sense of place and identity demonstrates how the film-making process strengthened a sense of identity and place, of how the research participants view a contemporary sense of place and identity, and how a belonging atmosphere contributes to a positive learning environment and a sense of place.

To the question, "does your film examine the concept of sense of place?" Student participant FF 3 answered "yes, the sense of individuality" (FF3, 2007). He added that the film making process "had definitely added" (FF3, 2007) to his sense of personal self-worth. Student participant FN 15 furthered that:

> If you pick a subject which you are passionate about, and you know what you want out of it, what you want to present, it is something you want to show, and something you might even want to learn more about yourself (FN 15, 2007).

The research participants had many varying and interesting responses to the prompt, “A sense of place to me is”:

> A sense of place to me is in the bush (FN 6, 2007).
>
> A sense of place to me is a feeling of connectedness, I guess a connection to the outdoors (Staff 2, 2007).
>
> A sense of place is belonging somewhere (Staff 1, 2007).
>
> A sense of place to me is hanging out at work, I like to work hard and play hard (FF 2, 2007).

A contemporary sense of place for these participants included a sense of belonging, a sense of connectedness to something or somewhere. Aboriginal participants connected their sense of place to their Aboriginal roots, their home communities. Victoria is home to a diverse Aboriginal population, the FNGP a school program existing in a school district with an 80% off-reserve Aboriginal student population. To “a sense of place to me is”, responses included:

> A sense of place to me is back in my hometown, Ahousaht (FN 8, 2007).
>
> I am from Kingcome, I am from Nuu-cha-nuulth people, and though I may live in the city, that is still home, who my people are (FN 15, 2007).

Student participant 15 furthers:

> Being able to tell people where I am from, there was a point where it did not mean a whole lot to me, it was just modern day living, My aunts and uncles and grandparents who were telling me that I need to be proud of who I was, and actually taking the time to talk to people to find out exactly where my family comes from and what our territories were and what our names are… I was taught to be proud of who we are and where we are from, we have persevered, even through all the suffering that we have been put through (FN 15, 2007).

Aboriginal participants directly related their concept of sense of place to their Aboriginal roots, their connection to their home territories. Student participant FN 10 furthers that her sense of place is a:

> Re-connect to my culture, cause I always felt a void in my life and never felt whole and that's when I came in contact with my culture, I felt a sense of pride in myself, I knew where I was from, so it doesn't matter where I am in the world, I am proud of my Aboriginal background (FN 10, 2007).

A sense of place strengthened one's sense of self identity. For the Aboriginal participants, a sense of place was directly related to their Aboriginal culture or home. Themes emergent in this section prove further the assertion that place is an integral strand and component of Aboriginal knowledge.

The FNGP has a sense of belonging as a key philosophy or cornerstone to its program delivery. It is a student centered environment, where Aboriginal components are incorporated into the curriculum, from art to literature to film-making. Aboriginal enhancement agreements throughout the province place a sense of belonging as a targeted goal for almost every school district (BC Ministry of Education, 2008). If students can develop a sense of place, a sense of belonging within a school, their willingness to participate, to attend, to succeed will increase. Project based learning and the technological capacity to deliver these programs has fostered a sense of place at the Westshore Annex.

> This school is definitely better than any school that I have been in. The projects like the Irwin Park, the cabin project and the Mac computers were not there at the normal school. Even the atmosphere is different at the annex, it has helped me change which is good (FN 11, 2007).

Throughout this research project, many significant themes emerged with respect to a sense of place and identity and Aboriginal ways of knowing. The research project allowed participants an opportunity to share their story and to express their view that AK strengthens their sense of identity; it confirmed that AK is based in place; that it is of critical importance to pass these teachings to our children; and a sense of belonging is a cornerstone of Aboriginal education.

Capacity

It is evident in this section that the research project added to the positive learning environment in the classroom; increased students' research, leadership and technological capacities; and increased students' sense of pride and self efficacy in the accomplishment of completing a film.

Capacity development must be one of the results of a PAR project. In Chapter two, Hall outlined the six principles of PAR as: its alignment with marginalized participants: it involves partners in research; its questions originate in community; its goal is to change, not just understand, it is a tool for mobilization; the researcher is a co-learner engaged in the process (Hall, 2004). These six principles were evident throughout the research project, but perhaps more so in this section.

I will examine four themes that emerged: what I (participants) learned; how I (participants) learned; community and personal development; and an AK cultural archive. This section will examine themes that develop under the research purpose of reflecting and documenting Aboriginal knowledge, and the development of students' research, leadership and technological capacities,

What I Learned

What I learned is a broad statement with respect to this research project. I use the term "What I Learned" in reference to the participants, and not myself as researcher. Ten films were submitted to the data pool, six of which focused on AK, two examined drugs and alcohol, and the final two brokered the topic of the environment. Participants who gained knowledge through their research and subsequent production of a film are clear evidence of personal capacity development. I will examine the two subjects of AK and the environment in this section.

What I learned with regards to AK is a theme that overlaps throughout the research project in the topics of Aboriginal knowledge, learning and knowledge transfer, and sense of place and identity.

What I learned and capacity development on AK examines furthers the significance of AK, particularly with respect to language. Participant FN 11 adds that she "would really love to do more projects on AK" (FN 11, 2007). It was clear that the significance of Aboriginal languages were a strong theme throughout the project. Two films, "Language" and "Nuu-chah-nuulth Language" had Aboriginal languages as their subject matter, while four others, "The Moon", "Beecher Bay Cultural Event", "Evolution of People", and "People of the Seafoam" distinctly featured elements of Aboriginal language throughout. Student participant FN 8 comments on the knowledge gained through her involvement in the project:

> Yea it did help a lot (being involved). Before, I did not know anything about my language up until I did this project, so what I know then, compared to what I know now is a lot stronger (FN 8, 2007).

With regard to learning Aboriginal languages, she furthers that "elders that speak it today should teach it in schools" (FN 8, 2007). Community participant 2 adds that the inclusion of languages should be taught in schools, "that it should start in kindergarten or preschool" (Comm 2, 2007).

Student participant FN 14 in his film, "Evolution of a People" clearly delineates the significance of Aboriginal languages. He furthers that it assisted in the transfer of AK through "giving people in the district some sort of idea where we stand on the whole language section, it got people talking about what should be done" (FN 14, 2007). It is interesting to note that the third goal of SD 62's Aboriginal Education Enhancement Agreement (EA) is:

> To increase knowledge of Aboriginal languages by both Aboriginal and non-Aboriginal learners (Sooke School District, 2009).

The EA furthers in its rationale that language forms the core of the Aboriginal identity, and the learning opportunities provided by learning Aboriginal languages opens doors for success for SD 62 students (Sooke School District, 2009). The EA goal of increasing knowledge of Aboriginal languages mirrors the significance that the research participants placed upon it.

Challenges to language programs presently are that they must encompass the child, home, community and school. School programs alone cannot solve the language problem. Schools cannot assume that they have the solution. The community needs to empower itself. School programs are not sufficient to maintain language. However, they are an excellent start, 80% of flourishing languages cited in the Statistics Canada Nations census had a school language program (Norris, 2005). A constant issue that arises is that students learn language at school, go home and speak English. There has to be a connection between the student, family, school and community. Creating or finding that connection is the critical challenge. Language revitalizing must come from within the community. Certainly, schools, committed individuals and organizations can help address the problem, but ultimately, language revitalization must come from within the community.

What I learned about the environment is the second theme emergent within this section. The majority of these findings resulted from the films, "Irwin Park Community Project" and "Youth and the Environment". The Irwin Park project is introduced through community participant 13 and the project coordinator:

> The Irwin Park project was designed to provide students with an alternative form of learning. The project is restoring an abandoned campsite into something the community can use, and in the process of that, the students are learning to do video making skills, they are interviewing each other and community members... The bonus is we have some First Nation community members giving workshops and explaining the heritage of the region, so all of the students have learned and

> expanded upon their knowledge of what this region is about historically and present (Irwin Park Community Project, Comm 13, 2006).

Community participant 13 advances the concept of capacity building throughout the community project:

> The Irwin Park project is really giving students involved a lot of employability skills, they are learning things here that they are going to use in life, teamwork skills, applied skills that will help them get a job and improve the environment, so it is a win win for all involved (Irwin Park Community Project, Comm 13, 2006).

There were many lessons learned, or knowledge gained through the students involvement in the Irwin park project, from small actions to acceptances of personal responsibility. Student participant FN 15 expresses a small sense of amazement at how the project has made a difference with him:

> Like the pop can, I used to throw it in the garbage or the side of the road, but now I recycle it, bit more environmentalist, freaky (FN 10, 2007).

Student participant FF 7 acknowledges that "if we don't do it (take care of environment), then nobody else will" (FF 7, 2007). Student participant FN 19 adds to the concept of responsibility through the concept of parenting with respect to Earth:

> The parents are everyone who are walking on the Earth, we all have the privilege to live on it and should take care of it. It is all our home, we may have homes, but the environment is actually our home. It is what is going to take care of us in the end. If we keep disrespecting the Earth and the environment, one day, it is just not going to look good (Irwin Park Community Project, FN 19, 2006).

The theme that emerged is that through providing the students and community members an opportunity to participate in an environmental restoration project, themes of stewardship amongst the participants emerged. This project furthered that concept through the digital documentation of it, allowing it to reach a greater audience and allowing participants to reflect on their involvement. "Knowledge shared is knowledge gained" was the phrase or logo that drove the community project, a clear illustration of capacity development.

How I learned

The process of creating films, moving through the three stages of development, implementation and evaluation, had some profound impacts on participants' personal capacity development. As in the previous section, “How I learned” is in reference to the participants’ learning and not as mine as the researcher. Students commented on the computer and teamwork skills they developed, as well as the strong sense of accomplishment once they completed their projects. In this section, “How I learned”, I demonstrate how the use of digital film with subject matter of relevance contributed to developing a positive learning environment.

The video editing process has many steps and processes to ensure it runs smoothly. However, there is a certain amount of exploration involved, of playing with all of the possibilities the movie making software has to offer. The student participants learned a considerable amount of technological capacity through their involvement. Student participant FF 1 expresses:

> When we first started playing around with the computers, I didn't really know a heck of a lot about computers. And now, you can pretty much throw any program out in front of me, and I can figure it out if I need to (FF 1, 2007).

Student participant FF 1 was an avid photographer, much of his contributions to the film process was taking beautiful natural shots of the environment, birds, and the local otter in the Irwin park lake. He adds that that:

> If it weren't for projects like the Irwin park project, I wouldn't have had the opportunity to document them. The computers here are another part, because I wouldn't have been inspired to go out and get another camera and start taking pictures again (FF1, 2007).

The process of creating films also allowed the students the opportunity to film themselves, ranging from on camera interviews, dramatic or humorous skits, or starring in music videos. The films that had drugs and alcohol as their subject matter included several dramatic scenes, of re-

enactments of the social ills associated with the use of drugs and alcohol, and the damaging effects it may have on a family. The film, "Youth and the Environment" included several humorous segments, one which included a student "Captain Environment" capturing two roughnecks out dumping toxic waste in a natural environment. One film, not submitted into the data pool, was created by a Media Arts student (FF2) was a music video where students and staff lip-synched and danced their way through a song. FF 2 forwards his experience as:

> It gave me acting experience. I also directed the film. I want to make another film like this, just better (FF2, 2007).

Of the films submitted, the majority were created in teams, ranging from two to class composites for the "Irwin Park Community Project" film. Four of the films, "Evolution of a People", "People of the Seafoam", "Language" and "The Moon" were primarily individual submissions with class assistance, from student interviews to camera work. There was considerable teamwork required to complete the majority of the films, through idea sharing to the breakdown of tasks. There were many challenges with this regard, one of which I will discuss in the next section. There was considerable personal development in the area of teamwork.

> At first, my challenges were being really narrow minded... and learning to step aside and allowing other peoples opinions and to respect their way of life. So the most important thing that I learned was teamwork, and that is something that has carried on beyond the doors of this school, but also in my home (FN 11, 2007).

The learning process provided some very satisfying senses of accomplishment for all involved. This includes the staff involved:

> Working with film has been a very transformative learning experience for me, because I see it as a tremendous tool to learn with (Staff 1, 2007).

Research through filmmaking provided profound learning opportunities for students involved:

> Research to me is a big word, but a fun word. To be able to go to different places, and meet new people, listen to their experiences, share their knowledge, have a

> cup of tea, going for lunch, collaborating with team members, and then coming out with the finished project months later, it is really amazing.. My experiences at Westshore have been very meaningful to me, and I have always enjoyed doing the research for a video project (FN 11, 2007).

Throughout this research project, it was clearly demonstrated that there was substantial growth in students' development of their research, leadership, teamwork and technological capacities. Their developed sense of pride and self efficacy in the accomplishment of film will be presented in the next section.

Personal and Community Development

The sense of accomplishment touched upon previously emerged as a notable factor for participants as they reflected on their involvement in the project and the next steps for themselves or their films. Through their efforts on creating a film, students' developed a sense of ownership about their films and the desire for the films to be "reach a bigger audience" (FN 11, 2007).

"How did the experience of going through this project make a difference in your life?" was one of the interview questions. The responses to this question were honest and surprising in the impact that the project had on participants:

> Working with the cameras, the computer and the people, it has become an emotional tool. I find it a healing tool for many people. On the topic of science, perhaps the destruction of traditional fishing grounds. I think that it can be very healing, and carry an emotional impact (FN 11, 2007).

> If I wasn't doing this, I wouldn't come back to school (FF 3, 2007).

> This school has helped me out quite a bit, getting back into taking pictures has been probably a major difference in my life (FF 1, 2007).

Participating and completing the film project also had profound impacts, developing a sense of pride and self efficacy in the accomplishment. To the interview question, "What have you learned in this project?" responses included:

> A sense of accomplishment (FF 3, 2007).
>
> Created a sense of self esteem and self accomplishment, and makes you motivated to move on and do more (FN 11, 2007).

In the film, "Nuu-chah-nuulth language", the experience of creating the film made student participant FN 8 "want to learn more," and believed that "the film should be shown to people looking to learn our language" (FN 8, 2007). Creating a film that inspires one to want to learn more about oneself, and share that feeling with others is a powerful statement of learning and the significance that students placed upon their films.

In his film, student FF 2 expressed a lighter sentiment, although it clearly demonstrates ownership of his film:

> I just hoped that everyone would enjoy it. At the presentation, everyone did enjoy it, a lot of people actually asked me for a copy of the video, everyone had a good laugh (FF 2, 2007).

In his powerful film, "Evolution of a People", student participant FN 15 expressed:

> It is my work, and I am proud of it, and more than anything, I will promote it as much as I can, and if I have the opportunity to go somewhere to show it, to give them that understanding, I will. Promotion is most important to me (FN 15, 2007).

The film, "Evolution of a People" has had showings throughout the country, through student film contests and University education conferences, notably at the annual conference of the Canadian Society for the study of Education (CCSE) conference held in Saskatoon, May, 2007. An abridged lesson plan is attached in the appendix E for "Evolution of a People" to accompany the film. Student participant FN 15 states his thoughts on his film and the impact it has had:

> I actually just got back from Saskatchewan, and the feedback I get, that's pretty much what I learned most is that if you put your hard work into it, put your heart into it, somebody will recognize it and appreciate it, and want to push forward (FN 15, 2007).

The film has been forwarded as a curriculum resource in the BC school system, specifically for BC First Nation Studies 12 for its relevance in the following learning outcomes: Self identity and worldview, Aboriginal languages, Aboriginal traditions, colonial impact and cultural revitalization. This validation of knowledge has not been lost on student FN 15:

> I thought it (the film) was going to do something, and when it did, I was happy and relieved, because it will not sit and collect dust, but is being developed into curriculum (FN 15, 2007).

Another example of student empowerment was a young lady involved in the Irwin park film, who returned to school the following year to create a film on Muir Creek, a creek in the Sooke municipality destined for development:

> It lit a fire within her. I saw her break out of her shell. She graduated and is working at Tim Horton's, and she saved enough money to buy herself a video camera, and she is now trying to save Muir Creek from being a dump site, and restoring it to a proper river. She has the ability to reach a bigger audience, she doesn't have to speak for herself, she has a tool, she can make this DVD, her tool for speaking (FN 11, 2007).

The process of creating these films has allowed these students the opportunity for personal development, for empowerment, for ownership of their learning, and furthered them to wanting to share this learning with a "bigger audience".

Film making projects go hand in hand with project based learning. Quite simply, for a film or documentary to be of interest, there generally has to be some original subject matter that is interesting. Community projects offer the schools an opportunity to foster relationships and partnerships with community partners, thus fostering community development. The Irwin Park project is the clearest example of this, the project partnering Westshore School, the City of

Langford, University of Victoria graduate students and the Colwood Rotary club. Westshore principal (Staff 6) offers:

> It is really a great opportunity for Westshore to be involved in some partnerships with Rotary, city of Langford. I was pleased to be working with the students at UVic doing the video project (Staff 6, 2007).

Langford city worker Comm 12 confirmed the community partnership theme through:

> The city went along with the project because it is a good community project, because it involves a number of organizations, these are the type of programs that build communities and bring people together (Comm 12, 2007).

The community project and the subsequent class documentary empowered the students and community in the personal and community capacity development. Knowledge shared is knowledge gained is a sentiment shared through Community participant 12:

> I had the opportunity to share what I know in terms if the natural environment. I got a lot of satisfaction trying to help people and see them succeed (Comm 12, 2007).

The personal and community capacity development, a fundamental concept of PAR methodologies was evident throughout this research project. Personal capacity development came in the form of advanced computer and camera technological skills, research skills, ownership of their learning, and an increased sense of efficacy and accomplishment. Community projects or project based learning worked well in conjunction with a digital film projects. "Knowledge Shared is Knowledge Gained" is a good example of the motto used with the Irwin Park project. Community capacity development came in the form of community partnerships and relationships that emerged from such community projects that were documented. Community capacity development also came in the form of the audience, that is, that audience learning is another vital aspect of the project.

Aboriginal Knowledge and Cultural Archive

The opportunity to form a cultural archive is a powerful outcome of the research project. One of the purposes of the research project was to reflect and document Aboriginal knowledge. As I interviewed Staff 1, the question was turned back onto me, how does video work as a tool for learning about AK? I responded that:

> For one, it archives, that is of critical importance. I have spoken of how the Kwakwaka'wakw recorded our songs in the 1930's, and at the time, it was not a big event, but 60 – 70 years later, we are learning and still using those songs in our cultural practices today, so our ancestors had the foresight to archive it. It seems like a simple thing, but simple things are not always done (Staff 3, 2007).

The archiving of Aboriginal knowledge is of vital importance today due to the unfortunate truth that our elders are passing. In the language section earlier, we learned that of the Kwakwaka'wakw, there were only 300 fluent speakers left. This number has likely dropped since that film was released in 2004. "Evolution of a People" producer, FN 15 stated he wanted to create his film to foster an optimistic perspective:

> I wanted to look into something more positive, and be able to say that these people kept our culture alive and our culture is a big part of why we are still here (FN 15, 2007).

Community member 14 shares how the use of modern technology, films, the internet, and various software had assisted him:

> I use a lot of the modern tools, computers, video. I totally believe in it. I have a friend in Nanaimo who I send songs over to the internet, he cleans them up and distributes them. We live up and down the Island, so there is no way we could share, it is a tool, that is all it is (Comm 14, 2007).

A knowledge base of Aboriginal ways of knowing provides a strong rationale for the use of digital film with respect to Aboriginal ways of knowing. Staff members 1 and 3 agree with this concept through:

> Who knows, in 5 -10 years down the road, you have created a knowledge base of Aboriginal ways of knowing, a library for the next generation. It preserves that moment, that time (Staff 1, 2007).
>
> Students can look back on, reflect on, and being able to share with students for years to come. It is helpful to have them recorded for their future generations (Staff 3, 2007).

The rationale is straightforward; AK is the vital ingredient in the sense of identity for our Aboriginal populations, in particular our youth. AK can also provide a complementary worldview that may benefit our world today. Given the challenges that face our Aboriginal populations today through the loss of language, loss of traditional teachings and the loss of natural resources, it is of vital importance that an archive of knowledge be maintained. The use of digital video is a useful tool in order to document AK and keeps it alive for future generations.

The opportunity to form a cultural archive is a powerful also allows for future learning opportunities. It is anticipated that beyond other classrooms using the model of us of digital film as a learning tool, the films themselves may become a curriculum resource with student consent. There are two lesson plans for the films “Evolution of a People: and “People of the Seafoam” in Appendix E.

Challenges

There were significant challenges that presented themselves throughout this research project. Many were introduced in Chapter 1 in the limitations section. I will forward two themes that emerged or were confirmed in this project. These include student participants’ limited Aboriginal knowledge base and the challenges of the film-making process itself.

Student participants expressed a limited understanding of Aboriginal knowledge; some offered rationale for their lack of understanding, whereas others offered only a limited or no understanding.

This is a challenge or limitation of the study as secondary high school students with a limited knowledge of AK may thus struggle with the subject matter. Indeed, the nexus of AK and WMS is a broad concept, one which may prove difficult for all learners.

In Chapter Three, I presented a brief description on lesson topics that were covered, including students exploring themes on: Aboriginal knowledge and science, compared and contrasted knowledge systems and worldviews, provided examples of Aboriginal contributions to science and technology, and examples of local Aboriginal knowledge in fields such as botany, environment, traditional land use and astronomy. These materials were presented primarily through teacher led discussions and teacher led brainstorming sessions. However, some students struggled with the concept of their Aboriginal ways of knowing and science being related.

FNGP students FN 3 and FN 8 answered questions such as, "What are your understandings and experiences of AK? Does your film follow oral traditions?" These straightforward responses clearly demonstrate a lack of knowledge:

> I am not sure (FN2, 2007).
>
> I don't know (FN 8, 2007).
>
> Let me think about that one (FN 2, 2007).

There are numerous reasons for students' lack of Aboriginal knowledge, and many of these have been presented throughout this paper, notably a breakdown in the AK transfer system through external forces such as the Residential school system. Student participant FN 10 offered their personal narratives as a result of those negative external forces:

> I don't really have that many understandings and experiences of AK because I don't really have a culture from my area (FN 10, 2007).

This is an interesting observation from the student; probing one to inquire whether he is unaware of AK and the practices from his traditional territory, or whether the Aboriginal knowledge systems from his First Nation have deteriorated substantially. I would propose it is a combination of the two. Two other FNGP students FN 11 and FN 3 forwarded rationale for their limited understanding from their personal experiences growing up:

> I am an Ojibwa women from Kettle Point reserve. I was adopted into a Dutch family. AK was something I never grew up with... just in the last ten years or so that I have reconnected with my Aboriginal background (FN 11, 2007).

> I was never really taught much of anything about Aboriginal knowledge (FN 3, 2007).

These student responses refer to the home as the place where one would learn about AK. As our AK systems were breaking down, the knowledge transfer systems to our children were being disconnected. It was anticipated that this research project and others of the like that promote AK as a valid knowledge system will address this knowledge gap.

Community participant 8, an elder from one of the local Coast Salish communities offers rationale for the Aboriginal knowledge learning gap as:

> Most of our people our age or younger don't know all of this (AK), they don't have the knowledge of all this stuff, because it was taken away from us (Language, Comm 8, 2007).

Community participant 17 offered his personal experiences as he recounts his life, growing up in Victoria, away from his Aboriginal home of Alert Bay:

> I think it [culture] empowers you, it enables you. I remember being 13 or 14, I remember being initiated. I was absolutely terrified. I hadn't really experienced that, and I was in the back room, I was actually thinking of sneaking out. Then you know, Edgar, my uncle Roy's son, his only son is 4 years old, and he had no apprehension at all, little 4 year old, because he was surrounded by it as a baby, the culture was imparted to him since he was very small. I wish that I had that (Evolution of a People, Comm17, 2004).

Community participant 17 describes his feelings of uncertainty with respect to his own sense of belonging to his culture. Yet, he is describing his initiation into the Hamatsa society, the highest ranking society of the Kwakwaka'wakw. This feeling of uncertainty would be even more profound for many Aboriginal populations who may not have an opportunity to dance, to be initiated into an Aboriginal society, as community participant 17 was at the age of fourteen. The diversity of our Aboriginal populations is addressed here, our off reserve urban Aboriginal youth experiencing a sense of uncertainty or fear with respect to their own culture. Uncertainty about one's role in their Aboriginal culture leads one to limited understandings of one's Aboriginal culture or knowledge.

A final challenge with respect to Aboriginal knowledge is acknowledging the difference between the oral and textual knowledge systems. One must recognize that the oral language knowledge transfer system is dynamic and fluid. Community participant 14 explains:

> When you take this information, it is not concrete, like I said, I am still learning, things may change down the road. It is like ripping a page out of a book in 1940, it is just where I am now, but 10 – 20 years from now, things could be different (Comm 14, 2007).

A "living document" is often referred to term with respect to written documents or agreements. Oral language as a knowledge system is a living knowledge transfer system. Thus, it is the goal and challenge that written text originating from an oral knowledge transfer system is transferrable into a living, fluid and dynamic document.

A critical aspect of the Aboriginal oral knowledge transfer system is the inherent responsibility of remembering what you witnessed. Creating a film archive eases that responsibility, yet enters the knowledge into a different realm. It is a challenge upon the audience to accept the responsibility of remembrance. Castellano touched upon another aspect of knowledge, that knowledge carries power:

> Because knowledge carries power to do good or ill will, many elders decline to have their knowledge recorded in writing or electronic media (Castellano, 2004, p.104).

The challenges of the film-making process are significant, including various challenges with the student participants themselves, ensuring there is enough support or mentor-ship, technological challenges, and perhaps the biggest challenge, time or the lack thereof.

A reality of this research project within the present school system is that some students are disengaged with their schooling and the curriculum presented at school. Thus, even if the project is presented as one that focuses on Aboriginal knowledge, and allows them a medium of computer technology to tell their story, some students face a considerable lack of intrinsic motivation to pursue their project. This is in no way surprising; there is no magic pill, no simple one step solution to addressing students and attempts to engage them to class projects. The responsibility is still with the teacher and school to present a curriculum meaningful and relevant to the students. That said, there was a variety of interesting and telling responses:

> Well, I didn't really have a topic, probably because I don't like science. The reason I do not like science is because it does not have anything really interesting (FN3, 2007).

This student eventually produced a short five minute film on the moon, by answering the following question, I want to make this film because “the moon is really big, and John told me to” (FN 3, 2007). He continued that that his understandings of science experienced “no changes, it is still boring” (FN 3, 2007).

In response to the question, “What does research mean to you? And what are your future plans for your film?” Student FN 10 offers:

> Research is really time consuming, and boring. My film, I don't know, it will probably just go on my shelf to never be seen again (FN 10, 2007).

The bottom line to some students was that the project was just another school assignment. In response to, “Is this project different from others in school”, FN 8 responds, “In some ways, it is, but not really” (FN 8, 2007). The “attitude is the aptitude” and the “teacher is more important than ever” (Ohler, 2008) are two of the revelations presented in chapter two that were overwhelmingly confirmed with this research project.

A challenge that exists at the other end of the spectrum is when students place expectations too high. The medium of creating films produces this amongst some students.

> The problem is I am a perfectionist. I take everything and even though people think it is good, it is not good enough and I drive myself crazy about it. I give myself headaches, I stress myself out, it is worth it, but hard (FF 3,2007).
>
> I wanted the film to look professional, so I had to repeat the scenes over and over again (FF2, 2007).

The myriad of technological opportunities via the movie making software often produces this sense of perfectionism. The challenges here often lead to time constraints and technological capacities. Movie making software can be fickle, “save often” is the mantra coached to students. There can be nothing more frustrating than watching the icon spin, knowing that you have not saved, and you have worked for two hours painstakingly editing your film.

Ohler’s revelation “It is the special responsibility of teachers to ensure that students use technology to serve the story and not the other way around” (Ohler, 2008, p. 6) is also applicable with regards to the absorbed student. Software opportunities, particularly with regards to special effects can often overwhelm a student, where the need to fill their films with effects can either take away from the story or overburden the computer. It is the role of the teacher to guide the student to present a focused story.

Another challenge facing students today is bridging the gap between the film that they may want to create and the film that would be appropriately in a school. I recall one of my first weeks at the FNGP where I told the students, "You can listen to any music you want, but nothing with overt swearing". There was a quiet pause as they processed those guidelines before a girl at the back answered me "well, that doesn't leave much". There was a constant issue of students wanting to push the envelope, whether it is music, language, dramatic scenes, or viewpoints that do not coincide with the intended values of a school. For example, the film "Pros and Cons of Marijuana Use" was a constant struggle as the student film-maker aimed to push his pro-marijuana viewpoint into the film. Student participant FN 11recognized this through:

> Have fun, just keep in mind some of the rules and regulations and policies and ethics of the roof that you are under (FN 11, 2007).

Teamwork can be viewed as capacity development, but in some cases can be a limiting factor. The number of computers and cameras at the Westshore annex determined that students should work in groups to allow maximum use of available computers and cameras. Challenges here include ensuring students share the workload and responsibilities of their project. Often, a group would stall if one of their members was not in attendance, or there was a member perceived as not pulling his or her weight. There were also differences of opinion on how students want their film to look also presented itself:

> Sometimes, working with a team is difficult, because you get set in a way on which you want the film to look (FN 11, 2007).

Ensuring there is enough support or mentorship to the students through their team and staff is another challenge of the project. Media Arts instructor Staff 1 elaborates on the challenges associated with students and mentors:

> One of the challenges is to be there as a mentor for each group. If a student has to work by themselves, and they are having trouble with a program, it can be quite frustrating if someone is not there immediately to help you put out that frustration. I suggest that someone should be there to help, even with the ideas (Staff 1, 2007).

The frustration referred to in the quote above is directly related to the struggles or challenges that exist with the limited capacity of the computers and cameras. I will preface this with my belief that the Westshore annex had excellent technological resources. However, some students' opinions differed:

> The challenge I see, getting better equipment, I had a crappy camera, we should get a better camera (FN10, 2007).

Computer and camera issues notwithstanding, there were challenges once the raw footage was transferred onto the computer for some students. Student FN14 laments some of the demands of editing:

> We had time limitations (length of film), and in that sense, I would have tried to squeeze more in, because there was stuff that was cut, and it was hard to cut (FN 14, 2007).

Student FF 3 concludes with some frank views on technology:

> You need lots of patience, I kept losing my work about 30,000 times. It is frustrating, technology is really really frustrating. I hate computers, I honestly can't stand technology, but I have to deal with it, it is forced in my face....you see, technology is a good thing, but is also an ass kicker (FF 3, 2007).

An aspect that has strong ties to technological challenges is the reality of time. There are a limited number of computers at the Westshore Annex, seven Apple computers, and three cameras. Each of these varies in range of age and quality. Westshore staff work hard to keep the computers running and optimal for film-making. As the deadline or film day approaches, the crunch on computer time increases, the required mentorship or staff help increases, students become more familiar with the computer software and its capabilities thus increasing the time spent on the

computer, and computers start being overworked that start to freeze forcing students to start their work over again. All of this pushes the valuable resource of time to the limit:

> I waited until the last minute and rushed it (FF3, 2007).
>
> We did not have enough time to do it (FF 2, 2007).
>
> I needed more time on the computer (FN10, 2007).
>
> You need a lot of patience and determination to finish your video (Staff 1, 2007).

All of these are attributes of the dimension of time, a real and overwhelming challenge in the film-making process. However, these would probably be headed off by following the simple advice of Westshore support worker:

> Allow yourself plenty of time to do your research and making your film, don't rush it (Staff 3, 2007).

Thus, there were real challenges that presented themselves throughout the research project, including student participant's limited Aboriginal knowledge base and the challenges of the film-making process itself. However, they are not unmanageable or out of the realm of normalcy for school projects. It is anticipated that research projects such as this, which look at Aboriginal knowledge as its subject matter, and allows students a new medium to express their knowledge, that these challenges may decrease as time moves on. These challenges or limitations may be seen as a narrative of this research project, or words of advice for projects which may to model its approach.

CHAPTER FIVE: SUMMARY

In chapter one, I presented the purpose of my research to investigate whether using digital film in the documentation and reflection of Aboriginal knowledge with respect to science was a positive learning tool. The themes that emerged through the data unequivocally support the use of digital film on Aboriginal knowledge with respect to science as a positive learning tool.

I endeavored to demonstrate how the research project met the goals in Chapter Four through the themes that were presented: Aboriginal knowledge; learning and knowledge transfer; capacity; sense of place and identity; and challenges and limitations.

Specifically, I examined whether this research project through the use of digital video would meet the following goals:

Developing a positive learning environment in the science classroom: students clearly indicated how the process of creating films on science and AK was a positive learning environment:

> "It (producing films) makes school a lot of fun, it also brings a lot of respect (FN 12, 2007)."

Reflecting and documenting Aboriginal knowledge: all films are a valuable archive and reflection of AK. Students started at the departure point of trying to understand the world around them, and created films on AK to investigate that exciting field.

> Students can look back on, reflect on, and being able to share with students for years to come. It is helpful to have them recorded for their future generations (Staff 3, 2007).

Developing students' understanding of Aboriginal knowledge: the creation of films on AK allowed the students the opportunity to acquire learn more or AK and it knowledge transfer systems.

> Yea it did help a lot (being involved). Before, I did not know anything about my language up until I did this project, so what I know then, compared to what I know now is a lot stronger (FN 8, 2007).

Research findings with respect to AK provided a wealth of data as students investigated, defined and presented traits of AK.

Developing students' understanding of Aboriginal contributions to science: This aspect focused primarily on opening the door of understanding that AK is a valid knowledge system that aids in the understanding of the world around us. These definitions provide an excellent starting point for investigation on the nature of science and AK.

> Science to me is a way to learn about everything (FN 5, 2007).
>
> Learning about how the world works (FN 8, 2007).

Development of students' research, leadership and technological capacities: students were introduced to the exciting world of research and the medium of film to express their findings:

> Research to me is a big word, but a fun word. To be able to go to different places, and meet new people, listen to their experiences, share their knowledge, have a cup of tea, going for lunch, collaborating with team members, and then coming out with the finished project months later, it is really amazing.. My experiences at Westshore have been very meaningful to me, and I have always enjoyed doing the research for a video project (FN 11, 2007).

A developed sense of pride and self efficacy in the accomplishment of film: students and film participants demonstrated a clear sense of pride on the accomplishment of their films:

> It is my work, and I am proud of it, and more than anything, I will promote it as much as I can, and if I have the opportunity to go somewhere to show it, to give them that understanding, I will. Promotion is most important to me (FN 15, 2007).

Development of a bridge of understanding between Aboriginal and Western modern science worldviews: this research project started at the departure point of science as a way to understand the world around us, and used the medium of film to examine that concept. The research and the films produced focused primarily on developing a greater understanding of AK and its significance in understanding the world around us. Thus, the films presented a greater understanding of AK,

and subsequently the world and may be viewed as a bridge of understanding between Aboriginal and Western modern science worldviews.

I have summarized the key findings from Chapter Four into two themes, essentially dividing the thesis statement into two, one theme focusing on Aboriginal knowledge, the other the use of digital film. Encompassed within the findings are the themes that emerged from chapter four which demonstrate how the use of digital film in the documentation and reflection of Aboriginal knowledge with respect to science contributed to meet the goals stated above. I will summarize these, starting with Aboriginal knowledge.

Aboriginal Knowledge

Aspects of Aboriginal Knowledge

- Language is a vital aspect of Aboriginal knowledge. "As we separate from our language, we separate from nature" (Comm 18, 2004). This statement unequivocally connects Aboriginal languages to Aboriginal knowledge to our environment and hence to a Western modern science worldview of systematically understanding the world around us.
- Resilience and resistance are traits that have allowed AK to survive to this present day, it being such a powerful factor that it should be considered a vital component of Aboriginal knowledge.
- Aboriginal knowledge stands on its own as knowledge system and does not need to judged or evaluated through the criteria set by WMS.

Knowledge Transfer Systems

- The importance of children in the knowledge transfer systems of Aboriginal peoples is paramount.

- The importance of elders in the knowledge transfer systems of Aboriginal peoples is vital, and the use of digital film may be a catalyst to re-ignite that knowledge transfer system.
- This project employed a learning by doing methodology, a vital strand of an Aboriginal knowledge transfer system.

Sense of Place and Identity

- There is a strong reciprocal relationship between sense of place, sense of identity and Aboriginal knowledge.

1. Who you are and where you are from are an Aboriginal perspective which parallels to the terms of sense of identity and sense of place.

Definitions of Aboriginal Knowledge

- Aboriginal knowledge includes a knowledge base, a knowledge system that forms relationships with the world around us, a knowledge system that demonstrates these relationships in a respectful and reciprocal manner, and a knowledge system that requires us to take the responsibility to pass this on to our children.

Aboriginal Knowledge Worldview

- The lens of Aboriginal knowledge can assist us to understand the world, to form respectful, reciprocal relationships with the environment around us; and as such it should be explored as a complementary worldview to Western modern science.

Digital Film

The use of digital film and the capacity development from being involved in the research project produced the following key findings.

Personal Capacity Development

- Personal capacity development occurred in the form advanced computer and camera technological skills and research skills.
- Personal capacity development occurred in the form of ownership of their learning, and furthered them to want to share this with a bigger audience.
- Personal capacity development came in an increased sense of efficacy and accomplishment.

Community Capacity Development

- Community capacity development came in the form of community partnerships and relationships that emerged from community projects that were documented.
- Aboriginal community capacity development came in the form that the films produced will assist to form a cultural archive.
- Community capacity development from an educator's perspective is the opportunity that people may use this research project as a model for their own learning. Aboriginal knowledge is based in place, and digital stories from throughout the country will only add to our learning.

Digital Film and Learning

- The use of digital film is a new form of storytelling. The advent of hand held cameras and movie making softwares allows the opportunity to be the producers of media and film, which presents a new avenue for our youth to tell their stories.

- Project based learning works well in conjunction with digital film projects. *Knowledge shared is knowledge gained* is an excellent example, the adage used with the Irwin Park project.
- The process of creating films mirrors the process of learning, the process of acquiring knowledge.

Through these nineteen key findings, it is evident that this research project achieved the goals of the project. The five themes that emerged through the data analysis: Aboriginal knowledge; learning and knowledge transfer; capacity; sense of place and identity; and challenges and limitations, all were encompassed with significant teachings. It is anticipated that in conjunction with the other research projects, it will add to the understanding and aid in providing an impetus for positive change in addressing Aboriginal knowledge and Science education in British Columbia's schools.

The two key themes that emerged were clear. The research project developed a greater understanding of the traits and the significance of AK, and that its greater understanding adds to a greater understanding of the world around us. The use of digital film was seen to have an overwhelming positive tool for students' learning. Finally, with respect to our world as a whole, the lens of Aboriginal knowledge was presented as a complementary worldview to Western modern science, as it can assist us understand the world and to form respectful, reciprocal relationships with the environment around us.

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APPENDIX A: CONSENT FORMS

Brian Fox
Superintendent
Sooke School District 62
3143 Jacklin Rd,
Victoria, BC
V9B 5R5

Application for school based research project

Dear Mr. Fox,

I write this letter of application to introduce a research project that which, I John Lyall will be the principal researcher. The research project is entitled *The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal knowledge with Respect to Science*. This research project is a part of the Aboriginal Science Research Project, a collaborative venture between the Aboriginal Enhancement Branch of the Ministry of Education and the University of Victoria to address the under-representation of Aboriginal students in science classes in British Columbia, and the under- representation of Aboriginal people in science related careers. This research project aims to determine why Aboriginal students are under-represented in science classrooms, and to find ways to significantly improve their involvement and achievement in science. The results of the study will be used to inform the Ministry, superintendents and parents with important information; and to guide teachers, curriculum developers, and program planners to develop culturally sensitive learning experiences.

This proposed research will be encased within the larger Aboriginal knowledge and Science Education Research Project. It will investigate the process of using digital film as a learning tool in the documentation and reflection of Aboriginal knowledge with respect to science. The purpose of my proposed research is to investigate whether on Aboriginal knowledge with respect to science is a positive learning tool. In conjunction with the other research projects within the larger Aboriginal knowledge and Science Education Research Project, it anticipates to add to the understanding and aid in providing an impetus for positive change in addressing Aboriginal knowledge and Science education in British Columbia's schools.

Student participants will create films with respect to Aboriginal knowledge and science as a learning tool in their science class. It will explore teaching strategies that enable science concepts to be related to First Nations concepts by using digital cameras to document Aboriginal knowledge with respect to science. It is anticipated that the project's inherent strategies of respect, experiential learning, personal engagement, local validation and relevance, and modern technology may be congruent with pedagogies of Aboriginal education.

As part of the learning for their science course, students will use digital video to record Aboriginal knowledge as it relates to science. This may be done in numerous ways, including capturing cultural and seasonal practices and conducting interviews with elders in the community about Aboriginal science knowledge. Based on the knowledge they acquire through their research, students will produce short educational films about Aboriginal knowledge and science.

The potential benefits of participation in this project are:

- the development of a positive learning environment in the science classroom for Aboriginal students
- the development of leadership skills and research expertise through participation in conducting research,
- the development of capacities in the use of digital video technologies as tools for organizing and presenting information on the subject matter of Aboriginal knowledge and Science as it relates to First Nations youth and their communities,
- the development of an understanding of the manner in which participatory action research can be used to develop school and community based initiatives for promotion of knowledge retention and transfer,
- a developed sense of pride and self efficacy in the accomplishment of film.

The production of digital videos on Aboriginal knowledge and science requires a discussion on the concept of ownership. Ownership of knowledge and the consideration that films may record culturally sensitive materials are important factors to consider. As such, it is the intention of this research project that the digital films be owned by the student filmmakers. The students will have to give expressed consent in order for the films to be shown publicly.

The research project intends to use the successful Traditional Pathways to Health (TPTH) model as its delivery model. The First Nations Graduation Program was a community partner for four years with TPTH, a UVic participatory research project that created over thirty-five films on themes of health and wellness with respect to Aboriginal youth.

The research project intends to start with the second semester start date in February 2007, ending after the third term in April 2007.

Please let me know if you have any further questions regarding my research proposal. I have applied to the University of Victoria Human Research Ethics Committee for approval to begin my study. You may reach the Associated Vice President, Research at (250) 472-4362 if you want to verify the ethical approval of this study, or raise any concerns. You can also contact my supervisor, Dr. Ted Riecken at 250-721-7757 or through email at triecken@uvic.ca. You may also contact me at 391-0687, cell phone 686-0233, or through email at jlyall@sd62.bc.ca. Thank you for this opportunity.

Sincerely,

John Lyall

Dave Betts
Principal
Westshore Centre for Learning and Training
814 Goldstream Avenue,
Victoria, BC
V9B 2X7

Application for school based research project

Dear Mr. Betts,

I write this letter of application to introduce a research project that which, I John Lyall will be the principal researcher. The research project is entitled *The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal knowledge with Respect to Science*. This research project is a part of the Aboriginal Science Research Project, a collaborative venture between the Aboriginal Enhancement Branch of the Ministry of Education and the University of Victoria to address the under-representation of Aboriginal students in science classes in British Columbia, and the under- representation of Aboriginal people in science related careers. This research project aims to determine why Aboriginal students are under-represented in science classrooms, and to find ways to significantly improve their involvement and achievement in science. The results of the study will be used to inform the Ministry, superintendents and parents with important information; and to guide teachers, curriculum developers, and program planners to develop culturally sensitive learning experiences.

This proposed research will be encased within the larger Aboriginal knowledge and Science Education Research Project. It will investigate the process of using digital film as a learning tool in the documentation and reflection of Aboriginal knowledge with respect to science. The purpose of my proposed research is to investigate whether on Aboriginal knowledge with respect to science is a positive learning tool. In conjunction with the other research projects within the larger Aboriginal knowledge and Science Education Research Project, it anticipates to add to the understanding and aid in providing an impetus for positive change in addressing Aboriginal knowledge and Science education in British Columbia's schools.

Student participants will create films with respect to Aboriginal knowledge and science as a learning tool in their science class. It will explore teaching strategies that enable science concepts to be related to First Nations concepts by using digital cameras to document Aboriginal knowledge with respect to science. It is anticipated that the project's inherent strategies of respect, experiential learning, personal engagement, local validation and relevance, and modern technology may be congruent with pedagogies of Aboriginal education.

As part of the learning for their science course, students will use digital video to record Aboriginal knowledge as it relates to science. This may be done in numerous ways, including capturing cultural and seasonal practices and conducting interviews with elders in the community about Aboriginal science knowledge. Based on the knowledge they acquire through their research, students will produce short educational films about Aboriginal knowledge and science.

The potential benefits of participation in this project are:

- the development of a positive learning environment in the science classroom for Aboriginal students
- the development of leadership skills and research expertise through participation in conducting research,
- the development of capacities in the use of digital video technologies as tools for organizing and presenting information on the subject matter of Aboriginal knowledge and Science as it relates to First Nations youth and their communities,
- the development of an understanding of the manner in which participatory action research can be used to develop school and community based initiatives for promotion of knowledge retention and transfer,
- a developed sense of pride and self efficacy in the accomplishment of film.

The production of digital videos on Aboriginal knowledge and science requires a discussion on the concept of ownership. Ownership of knowledge and the consideration that films may record culturally sensitive materials are important factors to consider. As such, it is the intention of this research project that the digital films be owned by the student filmmakers. The students will have to give expressed consent in order for the films to be shown publicly.

The research project intends to use the successful Traditional Pathways to Health (TPTH) model as its delivery model. The First Nations Graduation Program was a community partner for four years with TPTH, a UVic participatory research project that created over thirty-five films on themes of health and wellness with respect to Aboriginal youth.

The research project intends to start with the second semester start date in February 2007, ending after the third term in April 2007.

Please let me know if you have any further questions regarding my research proposal. I have applied to the University of Victoria Human Research Ethics Committee for approval to begin my study. You may reach the Associated Vice President, Research at (250) 472-4362 if you want to verify the ethical approval of this study, or raise any concerns. You can also contact my supervisor, Dr. Ted Riecken at 250-721-7757 or through email at triecken@uvic.ca. You may also contact me at 391-0687, cell phone 686-0233, or through email at jlyall@sd62.bc.ca. Thank you for this opportunity.

Sincerely,

John Lyall

Aboriginal Science Research Project

(Student Permission Letter)

You are being invited to participate in a study entitled *The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal knowledge with Respect to Science*. that is being conducted by me, John Lyall. I am doing this research project as part of the Aboriginal Science Research Project, a collaborative venture between the Aboriginal Enhancement Branch of the Ministry of Education and the University of Victoria. The research project originated to address the under-representation of Aboriginal students in science classes in British Columbia, and the under-representation of Aboriginal people in science related careers. The results of the study will be used to inform the Ministry, superintendents and parents with important information; and to guide teachers, curriculum developers, and program planners to develop culturally sensitive learning experiences.

My proposed research will be encased within the larger Aboriginal knowledge and Science Education Research Project. It will investigate the process of using digital film as a learning tool to in the documentation and reflection of Aboriginal knowledge with respect to science. The purpose of my proposed research is to investigate whether using digital film in the documentation and reflection of Aboriginal knowledge with respect to science is a positive learning tool. In conjunction with the other research projects within the larger Aboriginal knowledge and Science Education Research Project, it anticipates to add to the understanding and aid in providing an impetus for positive change in addressing Aboriginal knowledge and Science education in British Columbia's schools.

You are being asked to participate in this study because your teacher has indicated that the subject matter of this project relates to the content of your class. The subject of this research is Aboriginal knowledge with respect to science relates to the Science 11 curriculum, while the process of creating films relates to the Media Arts 11 curriculum.

If you agree to voluntarily participate in this research, your participation will include completing a questionnaire and being interviewed about your class project about using digital videos as a learning tool about Aboriginal knowledge and science. I would also like to videotape some of the interaction that takes place in the class room as you work on your class projects. In addition, with your permission, I would like to share your project with other people who are also interested in topics such as Aboriginal education and science, and using digital videos as a learning tool. This would involve showing others what you produce for your class project.

Participation in this study may cause some inconvenience to you, including some psychological or emotional discomfort if you choose to investigate a sensitive topic about Aboriginal knowledge such as Residential schools and the loss of traditional knowledge. If you encounter emotional difficulties as a result of your project, you should discuss this with your teacher (John Lyall) who will be able to give you or facilitate appropriate counseling and advice about how to deal with that discomfort.

The production of digital videos on Aboriginal knowledge and science requires a discussion on the concept of ownership. Ownership of knowledge and the consideration that films may record culturally sensitive materials are important factors to consider. As such, it is the intention of this research project that the digital films be owned you, the student filmmakers. You will have to give me, the researcher expressed consent in order for the films to be shown publicly. Although, I hope that you will be there to show your film to the public.

There are no known or anticipated risks to you by participating in this research.

The potential benefits of participation in this project are:

- the development of a positive learning environment in the science classroom for Aboriginal students
- the development of leadership skills and research expertise through participation in conducting research,
- the development of capacities in the use of digital video technologies as tools for organizing and presenting information on the subject matter of Aboriginal knowledge and Science as it relates to First Nations youth and their communities,
- the development of an understanding of the manner in which participatory action research can be used to develop school and community based initiatives for promotion of knowledge retention and transfer,
- a developed sense of pride and self efficacy in the accomplishment of film.

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you decide to withdraw from the project, any interviews that you have done with the research team will be removed from the study, unless you explicitly give the researcher permission to use the data collected to that time. If the interviews are done in a group setting, only those portions of the interview that you give the researcher permission to use will be included in the study.

Because this research project will involve videotaping of classroom activities and those activities will be taped on a number of occasions, to make sure that you continue to consent to participate in this research, I will verbally ask you for your permission each time I operate the video camera in the classroom.

In terms of protecting your anonymity, it is possible that you will be recognized if you appear in any of the research material gathered via videotape. If you do not wish to be videotaped because of the possibility of being recognized, you should let me know and I will not record you on videotape.

Unless you explicitly give the researcher permission to use your name, it will not appear in any of the videotaped materials.

Your confidentiality and the confidentiality of the data will be protected by keeping videotapes, audiotapes and other project data locked in the classroom or in the researcher's office at the Westshore Annex, 2139 Sooke Rd.

What is learned from this study will be communicated to others through reports and articles that the researcher will write. Some of these articles will be published in journals and some will be presented at meetings with other researchers. With your permission, I would also like to present some or all of your class project to others at these meetings, as examples of student research on health, well being and injury prevention. During these presentations I will ensure that the video materials are kept secure and safe from unauthorized copying or distribution.

Data from this study will be disposed of after a period of five years, in 2012.

As noted above, it is anticipated that the results of this study will be shared with others through reports, articles and presentations, and that your permission will be sought to use your class project as examples of student research, that will be shown as part of these presentations.

In addition to being able to contact the researcher at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting my supervisor, Dr. Ted Riecken at 250-721-7757 or through email at triecken@uvic.ca. You may also verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research, at the University of Victoria (250-472-4545).

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

_____	_____	_____
Name of Participant	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

First Nations Graduation Program Digital Video Project

Participation Consent Form

You are invited to participate in a research project about Aboriginal knowledge that is being conducted by _____. _____ is a student in the First Nations Graduation program at the Westshore Centre for Learning and Training in the Sooke school District 62. The purpose of the project is to provide students with an opportunity to study a topic of their choice as it relates to Aboriginal knowledge with respect to science. Students are to then create short educational films on their topic of choice. John Lyall, a teacher at the Westshore Centre for Learning and Training is the principal researcher of this project and is a graduate student of the Aboriginal Science Research Project, a collaborative venture between the Aboriginal Enhancement Branch of the Ministry of Education and the University of Victoria.

As part of this project, I would like to videotape your answers to several questions about my topic. If you agree to being videotaped, I may use some or all of your answers in a short video I am making about my topic. If you would like to see the completed film, I will be pleased to show you. When the video is completed, I will be showing it to others who are interested in the topic. These may include public showings at schools, universities, film festivals or conferences. These public showings of the video will mean that your voice and image could be recognized by others in the community. The video I am making is for educational purposes only and is not for profit sale.

Your participation in this video interview must be completely voluntary. If you decide to participate and change your mind, you can withdraw at any time without consequence. If you decide not to participate, I will not use any of your videotaped answers in my project. If you have any questions about my class project, you can ask me or contact my teacher, John Lyall at 250-391-0687, C: 250-686-0233 or through email at jlyall@sd62.bc.ca

Your signature below indicates that you understand the purpose of my project and consent to being interviews in my video project.

Name (please print) _____

Signature _____

Date _____

The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal knowledge with Respect to Science. Image Release Form

I hereby agree that The Use of Digital Video as a Learning Tool for Documenting and Reflecting Aboriginal Knowledge with Respect to Science (University of Victoria), and all persons authorized by or claiming through or under it, shall be entitled to:

1. Photograph or videotape and record my likeness, and collect and record any images and photographs produced or made by me, for the purposes of production whether by computer devices, videotape, or otherwise;

2. Make copies of the images, photographs and video recordings made;

3. Publish, exhibit, play, transfer and otherwise use the images, photographs, video recordings and any copies so made, or any part therefore, and,

4. Use my name or a code name chosen by me, (Code name is_____) and use my likeness, for the purposes of promotion and dissemination of research findings in the images, photographs, video recordings and any copies so made.

Date _____

Name (print) _____ **Phone number:** _____

Address _____ **Postal code:** _____

Signature _____

Signature of legal parent or guardian _____
(if participant is a minor, the release must be signed by legal parent or guardian)

Witnessed by (print) _____ **Signature** _____

This information has been collected, and will be used and maintained, in accordance with the policies and procedures of the Human Research Ethics Committee of the University of Victoria. Should you have any questions about the above, please contact researcher John Lyall, W: 250-391-0687, C: 250-686-0233 or through email at jlyall@sd62.bc.ca

APPENDIX B: RESEARCH AND INTERVIEW QUESTIONS

Research Questions

It is the intention and purpose of this research to investigate how the use of digital video contributes to;

- retaining and transferring Aboriginal knowledge,
- developing students understanding of Aboriginal knowledge,
- development of students' research, leadership and technological capacities,
- development of a bridge of understanding between Aboriginal and Western Modern science worldviews.

Specifically, this research project will attempt to answer the following questions:

1. What are local examples of Aboriginal knowledge as it relates to science?
2. What are students' understandings of and experiences of Science as instructed in school?
    a) In what ways do those understandings change after being involved in the video project?
3. What are students' understandings of and experiences of Aboriginal knowledge?
    a. In what ways do those understandings change after being involved in the video project?
4. What are students' perceptions of using video as a tool for learning Aboriginal knowledge?
5. In what ways do students use video as a tool for transferring Aboriginal knowledge?
6. What are student's perceptions of using PAR methodologies as an effective learning tool?
7. In what ways were student capacities enhanced through the involvement in a PAR based project focusing on Aboriginal knowledge and Science?

Interview Questions
FNGP students

1. Hello, what is your name and where are your from (Aboriginal heritage if applicable)?
2. What does Aboriginal knowledge mean to you?
3. What does Science mean to you?
4. Aboriginal knowledge and science: do you know of local (or where you are from) examples?
5. What is the topic of your class project? Why did you make a film on this topic?
6. The subject of this research project is Aboriginal knowledge with respect to science, how does your topic relate to this subject?
7. What does knowledge transfer mean to you?
8. A sense of place to me is…..
9. Creativity and storytelling are part of my project by…
10. Is this the first topic you considered? If not, what was your first topic and why did you change?
11. What have you learned about your topic so far?
12. What are your understandings of and experiences of Science as instructed in school?
13. In what ways do those understandings change after being involved in the video project?
14. What are your understandings of and experiences of Aboriginal knowledge?
15. In what ways do those understandings change after being involved in the video project?
16. How are you going about researching your topic?
17. Who are you interviewing and why?
18. What factors have influenced how you want produce your film?
19. What decisions have you made about how you want your film to look?

20. Will your film tell a story? If so, what type of story?
21. Will your film be creative? If so, how?
22. Oral traditions are central to Aboriginal ways of knowing? Does your film follow oral traditions? If so, how?
23. How did the experience of going through this project make a difference in your life?
24. What have you learned in this project?
25. What does research mean to you? Has this changed throughout the project?
26. Is this project different from others in school? If so, how?
27. What did you think of using video as a tool for learning about Aboriginal knowledge?
28. Did this assist as a tool for transferring Aboriginal knowledge?
29. What did you think of using video as a tool for learning about science?
30. If you were to do this project again, what would you do
    a) the same
    b) differently
31. What advice would you give someone doing this project?
32. What is the most important thing you learned on this project?
33. Thinking about final presentation, what do you hope will happen?
34. Do you have any future plans for your film?
35. Do you have any questions of me, or anything that you would like to add?

Interview Questions
FF students

Name: _____

1. Hello, what is your name and where are your from (Aboriginal heritage if applicable)?
2. What is the topic of your class project?
3. Is this the first topic you considered? If not, what was your first topic and why did you change?
4. What have you learned about your topic so far?
5. How are you going about researching your topic?
6. Who are you interviewing and why?
7. A sense of place to me is…..
8. Creativity and storytelling are part of my project by…
9. Is this the first topic you considered? If not, what was your first topic and why did you change?
10. What factors have influenced how you want produce your film?
11. What decisions have you made about how you want your film to look?
12. Will your film tell a story? If so, what type of story?
13. Will your film be creative? If so, how?
14. Does your film or topic focus or examine the concept of a sense of place?
15. How did the experience of going through this project make a difference in your life?
16. What have you learned in this project?
17. What does research mean to you? Has this changed throughout the project?
18. Is this project different from others in school? If so, how?
19. If you were to do this project again, what would you do

- the same
- differently

20. What advice would you give someone doing this project?
21. What is the most important thing you learned on this project?
22. Do you have any questions of me, or anything that you would like to add?
23. Thinking about final presentation, what do you hope will happen?
24. Do you have any future plans for your film?
25. Do you have any questions of me, or anything that you would like to add?

Interview Questions
Community participants

Name: _____

1. Hello, what is your name and where are your from (Aboriginal heritage if applicable)?
2. What does Aboriginal knowledge mean to you?
3. What does Science mean to you?
4. Aboriginal knowledge and science: do you know of local (or where you are from) examples?
5. What does knowledge transfer mean to you?
6. A sense of place to me is…..
7. What was your involvement with the film project?
8. Have you been involved in digital video or archiving projects before?
9. What message or theme did you present in your involvement?
10. Oral traditions are central to Aboriginal ways of knowing? Have your seen this in your life and your involvement with the film? If so, how?
11. What did you think of using video as a tool for learning about Aboriginal knowledge?
12. How can it assist as a tool for transferring Aboriginal knowledge?
13. What did you think of using video as a tool for learning about science?
14. If you were to do this project again, what would you do
    - the same
    - differently
15. What advice would you give someone (student or community participant) doing this project?

APPENDIX C: COURSE OUTLINES AND MATERIALS

Course Outline for Science and Technology 11

Instructor: John Lyall, jlyall@sd62.bc.ca, 391-0687
Time: Monday – Tuesday- Thursday 12:30-02:30 , February 5 – April 13 2007
Location: Westshore Annex

Course Description:

This is a grade 11 science credit that will introduce basic science concepts interwoven with topics relative to the students on the First Nations Graduation Program. It will examine Aboriginal knowledge as it relates to science and look to involve the community through field trips and guest speakers.

Course Content

Unit One:	Science and Technology Assignments and Tests	20%
Unit Two:	Diabetes	10%
Unit Three:	Sexually Transmitted Diseases	10%
Unit Four:	Drugs and alcohol	10%
Unit Five:	Nutrition	10%
Unit Six:	Aboriginal knowledge	10%
Unit Seven:	Environment	10%
Unit Eight:	Class Project	20%

A final grade will be determined in this course based on the Ministry Of Education Guidelines:

- A 86-100%
- B 73-85%
- C+ 67-72%
- C 60-66%
- C- 50-59%

Science and Technology 11

Film Assignment

Project: create a 5-10 film on the themes of Aboriginal knowledge and science.

Definitions of Aboriginal knowledge and science are complex and dynamic.

- Science may be described as an organized process to understand the world around us, knowledge attained through study or practice. A fundamental belief of the scientific method is, if followed explicitly, all mysteries of nature can be solved or discovered. A principle of the scientific method is the complete objectivity of the scientists conducting the experiments or formulating the hypothesis that is intended to produce value free, universally applicable scientific knowledge. It is the scientific method referred as the 'nature of science' that is the WMS' worldview.
- Aboriginal knowledge has been described as an ancient, communal, holistic and spiritual knowledge that encompasses every aspect of our existence. AK is specific to each nation and their natural adoption to their natural environment. Science tends to break down and classify areas of knowledge, AK is holistic, integrating their scientific processes within whole bodies of knowledge. AK teachings are value laden, maintaining a positive reciprocal relationship with the self, family, community and the natural surroundings.

We will use the following units to guide our process.

1. Unit 1: Exploration
2. Unit 2: Pre Production
3. Unit 3: Shoot Footage
4. Unit 4: Post Production
5. Unit 5: Sharing and Reflecting

Film Date: Wednesday June 13, 2007

Science Film Assignment

Name: partner:

Topic: use this page to describe what your video will be about. The themes of the film are Aboriginal knowledge and science.

My film will be about:

I want to make this film because:

The main message in my film will be:

The audience for my film will be:

Elements of a Short Story

List how the following will be introduced in film

Characters:

Setting:

Conflict:

Point of View:

Plot:

Suspense:

Theme:

Resources

After choosing a topic, you need to think about the elements of your short film

People to interview

Person Reason for including Contact Interview Time

Research: *internet, books, archives*

Pictures: *personal pictures, internet, archives, books*

Music: *traditional, garage-band, commercial*

Project Proposal Outline
(Excerpts from the BC Ministry of Education, *Digital Video Project Teacher Resource*, p. 71)

Theme
State the theme or themes that are addressed by the video. What is your video about? What is the message of your video?

Concept
In a paragraph, describe in more detail the purpose of the final product an dhow the purpose will be achieved in a video

Target audience
Who are you making the film for?

Medium
Describe the proposed format for film editing (Imovie, Final Cut express, Comic Life). Describe the format of the final product

Proposed dates
When is the project going to start and end

Resources required
List the people, technology and other resources required. This includes contacts and people in the community who have agreed to participate in some way

Detailed description
In two to three paragraphs, describe the general flow and sequence of the video in terms of opening, development and ending

Weekly Journal Reflections: stem questions to guide student thinking about their project.

Week One

- Aboriginal knowledge to me is….

Week Two

- Science as I know it is….

Week Three

- Aboriginal knowledge and science: what are local examples?

Week Four

- I want to make a film on my topic because…

Week Five

- I can get help on my project by…, from…

Week Six

- What does knowledge transfer mean to you?

Week Seven

- A sense of place to me is…..

Week Eight

- Creativity and storytelling are part of my project by…

Week Nine

Theme: thinking about final presentation

- I hope…
- I will…

Week Ten

Theme: reflecting on learning and what stands out the most for the student

- The most important to me in what I have learned is…
- I enjoyed_____ the most because…

Week Eleven

Theme: Next steps

My Nest steps with my film are:

Media Arts - Westshore Center for Learning and Training
September 2006

Purpose of media arts learning sessions:

Digital technologies are used daily in our society and attract the imagination of all ages. Youth of today have been born into a world of computers. The media arts sessions will provide students with a hands-on introduction to multimedia arts through computer software programs as listed below. Students in grades eleven and twelve will learn introductory aspects of the multimedia software programs. Students will be encouraged to explore software programs further as they create their own slideshow, video, music compilation, newsletter content and/or power point presentation. As well, students will learn safe operation of and care for all equipment including digital video and digital still cameras. The technical skills learned by the students will contribute to their fluency in current multi-media and computer-based technologies and software programs. Students will gain an appreciation of the processes required to convey messages using digital mediums and develop technological skills, which will enrich their education and add to their employability skills. Ultimately, students will experience a sense of accomplishment and self-esteem in completing the media arts sessions.

Media arts computer applications:

Students will choose three applications that involve working with moving images, still images, and audio. For example, students may choose to create a video that includes still photographs, audio and moving images. If students create a still photo slideshow with music and no moving image, they will be required to create a one to three minute video of moving images. Depending on enrolment, students may work as teams or on their own with up to ten students in a session at any one time. The following computer applications will be provided for students to explore and apply in their final media arts compilation.

- ComicLife – creating comic style newsletters, posters, announcements
- Garageband – music compilation and sharing with video editing programs
- iMovie – introductory editing program for video and photo video, final production
- Final Cut Express –industry standard video editing program
- iPhoto – photo storage, photo editing, creating slideshows
- iTunes – music downloading, storing music files, sharing music files with other software programs
- iDVD – creating DVDs of iMovie or Final Cut Express videos
- Keynote – power point presentations and information handouts
- Podcasting – introduction to podcasting – audio applications
- *Microsoft Publisher – newsletter, mini-booklets, posters

(*All of the above software will be used on Mac computers, except the Microsoft Publisher program that will be used on PC computers.)

Suggestions for multi-media projects to be decided upon by the students:

- Documentation of construction of cabins.

- Documentation of Irwin park restoration activities such as; trail maintenance and planting of native plants, construction of gazebo, way-finding kiosks, interpretive areas, trail construction, park improvements, or new park construction.
- Animal life in Irwin park.
- Plant life in Irwin park.
- Irwin Park ecosystem/habitat including streams and trails.
- Irwin Park history.
- Water study – Aboriginal teachings, watershed care, waterwheel construction, alternative energy.
- Cultural history and significance of Irwin.
- Traditional knowledge of plant or animal life in the park.
- Park programs.
- Park stewardship.
- Topics that students consider important in their education and learning.

Completed multimedia projects will be shared with peers and community. It is anticipated that students will enjoy their learning experiences working with multimedia and that they will be proud to present their finished compilation to others. This sharing may further students' learning through reflection, public feedback and public appreciation.

Session Structure

Week One: Discussion of purpose of media arts sessions and brainstorming media arts projects (teams or individual) that students will work on.
Week Two: Introduction to digital recording equipment such as still camera and video camera.
Week Three: Capture content and introduction to digital editing programs using still photos
Week Four: Capture content and introduction to moving image editing programs
Week Five: Capture content and introduction to audio editing programs
Week Six: Final capture of content, downloading and editing
Week Seven: Continue downloading and editing
Week Eight: Continue editing
Week Nine: Final Editing and Post Production
Week Ten: Final Presentation

Digital Storyboard (Ohler, 2008)

<table>
<tr><td><u>PAGE</u>:</td><td><u>DATE</u>:</td><td><u>PROJECT NAME</u>:</td><td><u>AUTHOR</u>:</td></tr>
<tr><td colspan="2" rowspan="2">Here you do a quick sketch of what will appear at this point in your digital story… you can also paste a graphic or photo here…do whatever works to remind you of what ‘s going on …
  </td><td>FRAME/EVENT DESCRIPTION</td><td>MEDIA LIST</td></tr>
<tr><td>Here you describe:
what will appear on the screen (picture, clip, graphic or other kind of visual)
what listeners will hear (music, narrative, sounds)
your director’s comments about what you are trying to achieve and communicate…</td><td>Here you list the specifics of every piece of media you will need; this will help you gather materials before beginning story construction; it also serves as a “works cited list” for copyright purposes…
Music, songs, sounds, voice recordings
Pictures, graphics, diagrams
Video clip
Text, titles, transitions</td></tr>
<tr><td colspan="4"><u>NARRATION</u>:

Here you write out or describe the narrative…</td></tr>
<tr><td colspan="2"></td><td></td><td></td></tr>
<tr><td colspan="4"><u>NARRATION</u>:</td></tr>
</table>

PAGE:	DATE:	PROJECT NAME:	AUTHOR:
		FRAME DESCRIPTION	MEDIA LIST AND DESCRIPTION
NARRATION:			
			
NARRATION:			

CAMERA EQUIPMENT CARE AND OPERATION SKILLS

Student Name _____ Date _____

EQUIPMENT: Digital Video Camera and Tripod

	Viewed by ___ Date:	**Comments**
SAFETY: Unpack/pack camera equipment in camera case, use camera strap		
Care of lens: avoid direct sunlight, clean with soft cloth (not paper product), keep free of sand and grit		
Insert/Eject DV tape		
CAMERA OPERATION: Power On/Off switch		
Battery and Power operation and hookup		
Start/Stop Recording		
Automatic/Manual Focus Shooting Mode Selectors		
Zoom In/Zoom Out		
Attach/Use microphone		
Attach/Use headphones		
Backlight Operation		
Use of LCD display and Viewfinder		
VTR/VCR playback - on camera		
VTR/VCR playback - on TV		
USE OF TRIPOD: Set up tripod – starting with first segment		
Attach camera		
Tripod 'Pan' adjust tension		
Tripod 'Tilt' adjust tension		
Tripod 'Dolly'		
Adjust height of camera		
Take down tripod: - remove camera safely - reattach quick release platform to tripod		

- **Person to be with the camera and tripod at all times.**
- **Handle equipment with care and store in a safe place.**

Westshore Project EDIT LOG

Date: _____ ___ PAGE # ___OF ___ Project Name _____Initial __

TAPE TITLE (TOPIC)_____TAPE *_____Camera_____

Time In 0:00:00 Hr:Min:Sec	**Time Out** 0:00:00 Hr:Min:Sec	**Duration**	**Description** (EWS, WS, MS, MCU, CU, ECU, Cutaway, Cut-In, Two-shot, OSS, POV, Topic, Subjects)	**Audio/ Visual** (Good, Fair, Poor)	**Comments**

***NOTES:**

INTRODUCTORY VIDEO EDITING SKILLS

Student Name: _____

Computer Care and Operation	**Viewed by _____ Date:**	**Comments**
Power bar – ON/Off		
Monitor – on/off		
Keyboard and Mouse USB port		
Printer – USB port		
Scanner – USB port		
Firewire port – for digital video camera		
USB port for: - flashdrive - digital still camera		
Headphones port		
Log In/ Log Out		
Editing in iMovie		
Connect Video Camera (VTR mode) with Firewire cable and port		
Open/Close iMovie		
Setup New Project		
Capture/Import video footage		
Save project		
Edit imported footage on timeline – copy, paste		
Add text – title, credits		
Insert transitions		
Add sound, sound effects		
Adjust audio, special effects		
View video – large screen format		
Download video to DV tape		
Screen video on TV monitor		

Using DVD Checklist

Student Name: _____

Using iDVD	**Viewed by _____ Date:**	**Comments**
Export video into Quicktime format for importing into iDVD		
Open iDVD program		
Create your iDVD project		
Choose an iDVD project format		
Import Quicktime movie		
Prepare file for burning DVD disc		
Burn DVD disc		
View DVD on DVD player and TV monitor		

APPENDIX D: STUDENT SELF ASSESSMENTS / RUBRICS

Participant Evaluation Rubric
Name: Date:

Aspect	Beginning	Developing	Meets Expectations	Exceeds Expectations	Value
Attendance / Punctuality	Attendance / Punctuality less than 50%. No communication.	Attendance / Punctuality 50% - 70%. Communication.	Attendance / Punctuality 70% - 90%. Communication.	Attendance / Punctuality above 90%. Communication.	
Participation / Team player	Non – involvement. Path of least resistance.	Limited involvement. Contributes when asked upon. Collaborates with others given a model.	Full solo participation. Contributes where capable. Respects team members.	Full class participation. Actively involved and assisting, supporting and encouraging class.	
Critical Thinker	Can use basic critical thinking skills when given a model.	With support, can use specific critical thinking skills.	With direction, selects from a variety of critical thinking skills to solve problems.	Independently selects from a range of critical thinking skills to work on or solve problems.	
Independent Worker	Unable to work without close supervision.	Works well with supervision.	Works well without supervision.	Works well without supervision, helping and supporting classmates.	
Research	Under supervision, can locate basic facts from primary and secondary sources.	Under supervision, able to access pre-selected primary and secondary sources.	Under supervision, is able to access a wide variety of primary and secondary sources.	Independently accesses a wide variety of primary and secondary sources.	
Completes tasks	Assignments not handed in.	Assignments handed in late (over one week).	Assignments handed in up to one week late.	Assignments handed in on time.	
Materials Use	Unsafe use and care of materials and equipment.	Usually satisfactory handling of materials and project equipment.	Satisfactory safe handling, use and return of project equipment and materials.	Excellent safe handling , use and return of project materials and equipment.	

Comments

_____

_____

Teacher signature:_____

Digital Film Evaluation Rubric

Name: **Date:**

Aspect	Beginning	Developing	Meets Expectations	Exceeds Expectations	Value
Overall Impact	Some sections of film easy to watch, deliver a sense of clarity. Shows little evidence of research.	Most sections interesting. Purpose of film is clear in most of film. Shows evidence of some research.	Interesting to watch throughout. Strong sense of purpose. Evidence of thorough research.	Visually stimulating. Powerful sense of purpose. Shows evidence of strong research.	
Creativity / storytelling	Generic film, story provides little learning for audience.	Reasonably creative film. Story provides learning for audience.	Creative film with story presenting considerable learning for audience.	Original and very creative film. Story has significant learning for audience.	
Sequence (Opening, development, ending)	Weak beginning and ending. Poor pacing. Difficult to detect the structure of development	Attempts to engage viewer. Generally good pace and story development. Clear ending, theme may not be clear.	Engages the viewer, introducing theme. Well paced and story development. Clear ending that reinforces theme.	Strongly engages viewer, creating interest in film. Powerful story development and effective pacing. Strong ending that reinforces theme.	
Technical quality	Poor quality (sound, image, transitions, titles) that affect the ability of viewer to understand film	Generally clear and effective technical quality. May be rough in spots.	Consistently good technical quality throughout film.	Consistently strong technical quality throughout film which strengthens film's message.	
Aboriginal knowledge and science	Film addresses theme of AK and science	Film clearly addresses theme of AK and science	Film clearly addresses and informative choice on topic, theme (of AK and science)	Film clearly addresses and excellent, informative and original choice on theme (of AK and science)	

Comments

_____

_____

_____

Teacher signature: _____

The overview in the BC First Nations 12 Digital Video Project Teacher Resource (2004, p. 49, 63) provided the model for rubric.

APPENDIX E: LESSON PLANS

Evolution of a People
2005, 25 minutes

Learning Outcomes

- For First Nations people, their land, language, culture and family heritage define their identity (BC First Nation Studies 12, Teacher guide)
- Traditions and teachings have been passed through the generations in oral histories
- The effects of colonialism has had crippling effects on the knowledge transfer of Aboriginal traditions, yet dynamic Aboriginal cultures and traditions survived and continue to pass through the generations.
- Aboriginal communities often went 'underground' in an effort to keep their aboriginal traditions alive.

Lesson Plan (Teacher may implement aspects of lesson plan as they see fit)

---

1. Read and discuss background with students

2. Read and discuss key concepts with students

3. **Activate Prior Knowledge**
    a. Map activity:
        i. Locate and shade in Kwakwaka'wakw territory
        ii. Locate and label Alert Bay, Kingcome Inlet and Village Island

4. **Predict and Question**
    a. Using a Know – Wonder – Learn chart, introduce and discuss many or one of the themes discussed in the film:
        i. Anti – potlatch law
        ii. Residential schools
        iii. Aboriginal languages

5. **Watch film**

6. **Demonstrate Understanding**
    a. Assign students questions in Aboriginal traditions section.

7. **Reflect / Extend on Learning**
    Answer the following in multi paragraph format, using the film as one of your sources.
    a. Explain how First Nations have passed on knowledge, traditions and culture over time. Support your answer with specific examples.

    b. Explain how aspects of the Indian Act, including residential schools and the anti-potlatch have impacted First Nation cultures, in the past and present. Support your answer with specific examples.

Background

Evolution of a People by Alvin Dick is a powerful look at culture, history and the will to survive. It examines the views of contemporary Aboriginals queried on their perspectives on the significance of culture in their histories and today, the challenges facing their Aboriginal cultures and the significance of culture for their children and children yet unborn.

The film is primarily set in Alert Bay, BC focusing on the peoples of the Kwakwaka'wakw nation. The film portrays the undeniable trans-generational effects of the Indian Act and the anti-potlatch law and Residential schools that were perpetuated onto Aboriginal populations of Canada. Themes of cultural and self identity, worldview, Aboriginal traditions, Aboriginal languages and cultural revitalization are also prevalent and connected throughout.

The Anti – potlatch law and the residential schools of the Indian Act and there long lasting impacts on younger aboriginal populations of today is clearly portrayed. It is clearly evident throughout the film that legislation of the past, of things that happened 'a long time ago' has dramatic impacts today on the Aboriginal populations of Canada. The loss of Aboriginal language is perhaps foremost portrayed in the film, one of the most significant impacts affecting the Aboriginal populations today.

It is only a guide that teachers or community members may feel free to use in their classrooms or homes as they best see fit. There is however, strong connections and ties to the BC provincial courses of BC First Nations Studies 12 and Social Studies 10.

The film was created at the Westshore Centre for Learning and Training (Sooke school district 62) in 2004 by student filmmaker, Alvin Dick. In partnership with the UVic Traditional Pathways to Health Research (TPTH) project, Alvin formed four questions in interviewing:

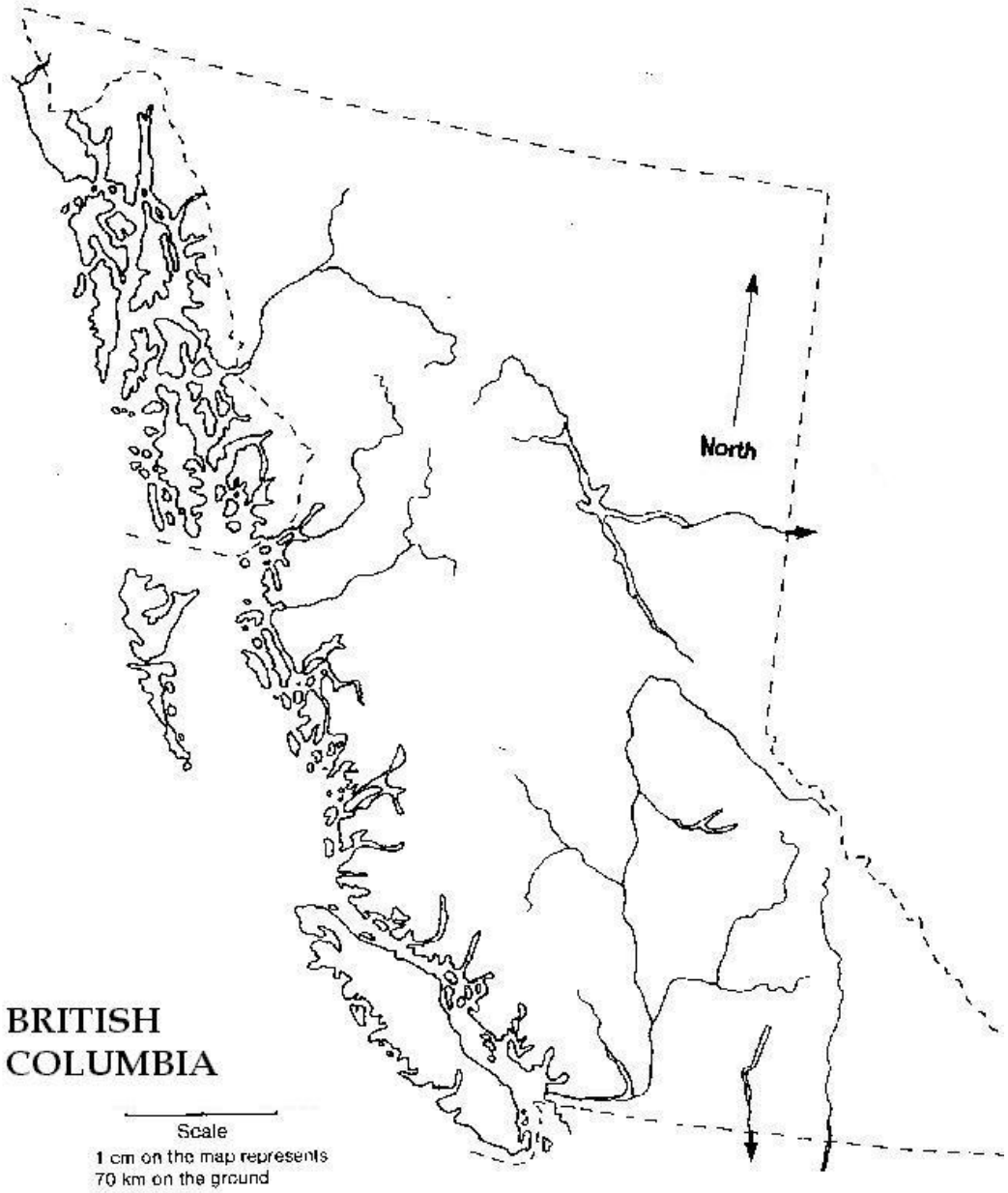
1. What does culture mean to you
2. How has culture affected your everyday life
3. what have been the most drastic changes to our culture in the last century
4. why is important for our young people to be involved in our culture

Alvin interviewed six people, primarily artists or people who he felt had strong connections to their culture, and shot footage in Victoria, Saanich, Alert Bay and Kingcome Inlet, BC. Using a hand held camera and Apple filmmaking software, Alvin created his film breaking it into five sections: *Culture and Life, Culture Today, Cultural Genocide, Losing our Voices and For our Children*.

The film has been received very well and has been shown at numerous educational conferences, schools and universities. The TPTH project aims to further its dissemination by creating this guide and teacher resource kit for dispersion.

Alvin Dick of Nuu-chah-nulth and Kwakwaka'wakw descent continues to work in the medium of digital film.

Locating



Using your text, an atlas, or the internet complete the following.

1. Shade in Kwakwaka'wakw territory
2. Locate and label Alert Bay, Kingcome Inlet and Village Island

Aboriginal Traditions

The continuance of Aboriginal traditions is a theme spread throughout the film. Evolution of a People investigates the struggles of transferring the Aboriginal traditions of the Kwakwaka'wakw in the 20th century. Aboriginal traditions presented include the potlatch, traditional forms of knowledge transfer. It also examines the challenges faced by Aboriginal ancestors who went underground, in what turned out to be a successful form of keeping Aboriginal traditions alive, the challenges of practicing Aboriginal traditions in a modern world, a world where Aboriginal languages are in currently precarious state. However, the film overwhelmingly presents a theme of survival, of the overwhelming desire and need to keep Aboriginal traditions alive today and forever. Use the following images and quotes to answer the following questions

Image

Questions

1. Can you list Aboriginal traditions? What are some Aboriginal ceremonies?
2. In the photographs what can you identify about Aboriginal traditions?
3. How are Aboriginal traditions pass on to the next generations?

Quotes

Knowledge transfer

Culture was never there for me, it was for my family…it never belonged to me. Anything you learn today doesn't belong to you, you learn as much as you can and pass onto the next generation.

George Shaughnessey, Kwakwaka'wakw

Potlatch

When one's heart is glad, he gives away gifts.
It was given to us by our Creator, to be our way of doing things,
to be our way of rejoicing, we who are Indian.
The potlatch was given to us to be our way of expressing joy."

Agnes Alfred, Alert Bay, 1980

Resistance

We were very fortunate to have some of our older people who said no, who saw it as very important to keep alive… Because of that, we are able to do what we do today

Kevin Cramner, Kwakwaka'wakw

Questions

1. Choose one of the three quotes. What do the words mean to you?

2. From the quote what information can you collection about BC Aboriginal culture?

Seafood for Life

Filmmaker Arliss Daniels looks at how seafood is an integral component of the Aboriginal culture of the Pacheedaht people of Port Renfrew. It is a simple, short film of about 7 minutes. It demonstrates the Aboriginal concept of interconnectedness of the environment is reflected in responsibility for and caretaking of the environment

Learning Outcome

This film may be appropriate for the grade 4 science curriculum under the learning outcome

- Demonstrate an awareness of the Aboriginal concept of respect for the environment

Goal

To present a living Aboriginal community, the Pacheedaht (the People of the Sea Foam) as they live with and with a reciprocal relationship with their local environment

Activate Prior Knowledge

- Map activity: locate Port Renfrew on map of Vancouver Island, locate and shade Nuu-chah-nulth territory on map of Vancouver Island
- Brainstorm: Seafood: what types of seafood do you know of? What types have you eaten? What types of seafood are presented in film?

Question

The ocean and beaches are our supermarket. Arliss Daniels

1. What does this quote mean? How is this demonstrated in the film?

2. What does the First Nation name of Pacheedaht mean? Why is this an appropriate name for the people?

Demonstrate Understanding

Research a seafood presented in film (urchins, rock stickers). Present to class in poster form.

Reflect on Learning

Write a journal reflection on visiting the small community of Port Renfrew. Would you like to walk the beach, camp, fish, hike the west coast of Vancouver Island?