Place-based and LMS/Technological Learning Environments which Reflect Indigenous Perspectives and Build an Ecology of Place

by

Jeremy Janz

B.Ed., Simon Fraser University, 2011
B.A., Simon Fraser University, 2010

Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Arts

in the
Curriculum and Instruction Foundations Program
Faculty of Education

SIMON FRASER UNIVERSITY

Summer 2016

Approval

Name: **Jeremy Janz**

Degree: **Master of Arts**

Title: ***Place-based and LMS/Technological Learning Environments which Reflect Indigenous Perspectives and Build an Ecology of Place***

Examining Committee: **Chair:** Allan MacKinnon
Associate Professor, Faculty of Education

David Zandvliet
Senior Supervisor
Associate Professor,
Faculty of Education

Milt McClaren
Supervisor
Professor Emeritus,
Faculty of Education

Vicki Kelly
Internal Examiner
Associate Professor,
Faculty of Education

Date Defended/Approved: June 10, 2016

Ethics Statement

The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

a. human research ethics approval from the Simon Fraser University Office of Research Ethics

or

b. advance approval of the animal care protocol from the University Animal Care Committee of Simon Fraser University

or has conducted the research

c. as a co-investigator, collaborator, or research assistant in a research project approved in advance.

A copy of the approval letter has been filed with the Theses Office of the University Library at the time of submission of this thesis or project.

The original application for approval and letter of approval are filed with the relevant offices. Inquiries may be directed to those authorities.

Simon Fraser University Library
Burnaby, British Columbia, Canada

Update Spring 2016

Abstract

This Masters thesis is a case study of a remote indigenous community off the north coast of British Columbia in a place called Hartley Bay. It focuses on the *Gitga'at* community school, called Hartley Bay School, and the intertwining of "Place-Based" learning environments with Technological learning environments. This study uses a mixed-methods approach and relies most heavily on both survey (PLACES and WEBLEI) and interview tools but also implemented a myriad of other triangulation instruments. The curriculum implemented was based on the BC Curriculum guides and utilized a cross-curricular approach. Hartley Bay School is a remote village school which has about 30 students. This study focused on a class of 7 students from grades 6-8. Students participated in the *Lu lax kyook Ecological Monitoring Project* which combined Science, Math, Socials, English, and Media Visual Arts curriculums. *Lu lax kyook* is an estuary about 5 minutes away from Hartley Bay on boat.

Keywords: Learning Environments; Place-Based; Technology; Indigenous; Cross Curricular; BC North Coast

To my wife and kids.

For all the hours missed
- times I'd have kissed -
you.

Acknowledgements

I acknowledge Snaxeet (Ernie Hill), Chief of the Eagle Clan *Gitga'at Nation*, and former principal of Hartley Bay School, for his inspiration, dedication and guidance through this study. His son, A'aayawx (Cameron Hill), Speaker for the Chief of the Killer Whale Clan *Gitga'at Nation*, and current principal of Hartley Bay School, for his unequivocal support and willingness to help implement the *Lu lax kyook Ecological Monitoring Project*. I also acknowledge Kwil'lanaxnox (Helen Clifton), Matriarch of the Killer Whale Clan *Gitga'at Nation* and mother of the hereditary chief, for her blessings and support for my work with the *Gitga'at* youth; and the entire *Gitaga'at* community who treated my family as if we were *Gitga'at* and to this day are a big part of my family's lives. Also Chris Picard and the *Gitga'at Guardians* for their support, use of their boats and educational knowledge. I acknowledge Hartley Bay School, the *Gitga'at* elders, youth and my students without whom this study would not be possible. Finally, I acknowledge School District 52 and Sandy Jones who gave both their blessings and unwavering support for this research and me as an educator in general.

Table of Contents

Approval ii
Ethics Statement iii
Abstract iv
Acknowledgements vi
Table of Contents vii
List of Tables x
List of Figures xi
List of Acronyms xii

Forward xiii

Chapter 1. Introduction 1
1.1. Stories 1
1.2. Why this Project? Why this School? 10

Chapter 2. Literature Review 14
2.1. Indigenous Worldview and Tensions with Traditional Educational Models 14
2.2. Introduction to Learning Environments Research 21
2.3. Learning Environments Research History 23
2.4. [Place]-Based, Cross-curricular and Indigenous Pedagogical Theory 26
2.4.1. [Place]-Based Pedagogy 27
2.4.2. Cross Curricular Pedagogy 34
2.4.3. Indigenous Pedagogies 35
2.5. [Place]-Based Learning Environments, Constructivism, Phenomenology and Critical Pedagogy 37
2.6. Curricular Manifestations of [Place]-Based Learning Environments 45
2.7. Technological Learning Environments: [Place]-Based Philosophical Considerations 47
2.7.1. Development and Corporatization of Computer Technology 48
2.7.2. Hacker Philosophy, Theory and Response to the Corporatization of Technology 51
2.8. Technological Learning Environments: From Research Towards an Integration Into [Place]-Based Learning Environments 53
2.9. The History and Design of *Mahara* 56
2.10. A Pedagogical Orgy: Co-integration of Pedagogy 58

Chapter 3. Methodology 61
3.1. Introduction 61
3.2. Case Study – Theory 62
3.3. Triangulation – Mixed Methods Model 64
3.4. Research Questions 68
3.5. Case Study – Process 69
3.6. Participatory Action Research and [Place]-based Design and Structure 72

3.7. Triangulation – Mixed Methods Process 75
3.8. Data Coding 76
3.9. Contextualizing Quantitative and Qualitative Data 80
3.10. PLACES Survey 81
3.11. Technological Learning Environment Questions 83
3.12. Qualitative Interviews 85
3.13. *Mahara* – Structure and Methodology 86
3.14. Other Technological Tools 88
3.15. Clarification of Extra-Researcher Roles 88

Chapter 4. Survey Results and Qualitative Support 93
4.1. Introduction 93
4.2. PLACES Survey and Relevant Qualitative Data 93
4.2.1. Relevance and Integration 94
4.2.2. Critical Voice and Shared Control 96
4.2.3. Open Endedness 98
4.2.4. Group Cohesiveness 99
4.2.5. Student Involvement 101
4.2.6. Student Negotiation 103
4.2.7. Environmental Interaction 104
4.3. Technology and Culture Survey and Relevant Qualitative Data 107
4.3.1. Emancipatory Activities 107
4.3.2. Co-Participatory Activities 108
4.3.3. Student Benefits 109
4.3.4. Information Structures and Design Activities 110
4.3.5. Indigenous Culture 111
4.3.6. [Place] and Technology 113

Chapter 5. *Mahara* Website / LMS Secondary Data and Discussion 116
5.1. Introduction 116
5.2. Cumulative Page Views and Artefacts 120
5.3. Google Analytics 124
5.4. *Mahara* / LMS and Qualitative Data Considerations 128

Chapter 6. Discussion and Limitations 132
6.1. Analysis of Research Question/Survey Results and Observations 132
6.1.1. Critical Voice and Shared Control 132
6.1.2. Openendedness 134
6.1.3. Student Negotiation 136
6.1.4. Co-Participatory Activities 137
6.1.5. Information Structure and Design 137
6.1.6. [Place] and Technology 138
6.2. Moving from Results to Considering Research Questions 138
6.2.1. How do indigenous communities and students perceive learning environments? 139
6.2.2. Does the addition of modern technological tools foster engagement and encouragement within remote indigenous communities? 140

6.2.3. Can the combination of [place]-based and LMS/technological learning environments incorporate indigenous perspectives and enhance student performance? 143
6.3. Limitations, Recommendations and Further Research 145
6.4. Conclusion 146

References 149
Appendix A. Qualitative Data Catecorization and Comparison - RAW 164
Appendix B. Survey Quantitative Data - RAW 178

List of Tables

Table 4.1. Relevance and Integration: Collective Answer Means 94
Table 4.2. Critical Voice: Collective Answer Means 96
Table 4.3. Shared Control: Collective Answer Means 97
Table 4.4. Open Endedness: Collective Answer Means 98
Table 4.5. Group Cohesiveness: Collective Answer Means 99
Table 4.6. Student Involvement: Collective Answer Means 101
Table 4.7. Student Negotiation: Collective Answer Means 103
Table 4.8 Environmental Interaction: Collective Answer Means 105
Table 4.9. Emancipatory Activities: Collective Answer Means 107
Table 4.10. Co-Participatory Activities: Collective Answer Means 108
Table 4.11. Student Benefits: Collective Answer Means 109
Table 4.12. Information Structures and Design Activities: Collective Answer Means 110
Table 4.13. Indigenous Culture: Collective Answer Means 111
Table 4.14. [Place] and Technology: Collective Answer Means 113

List of Figures

Figure 1. Pedagogical (Tri)force 59
Figure 2. Raw Google Forms Data 78
Figure 3. Raw Google Forms Data Categorized in Microsoft Excel with Equations 79
Figure 4. Graph of Category Means and Standard Deviation of PLACES Survey 106
Figure 5. Graph of Category Means and Standard Deviation of Technology and Culture Survey 115
Figure 6. Example of *Mahara* Student Page 119
Figure 7. Graph: *Mahara* Cumulative Page Views 122
Figure 8. *Mahara* Average Session Duration 125
Figure 9. *Mahara* Hourly Page Views 127

List of Acronyms

AH	After Hours
ALE	Actual Learning Environment
CES	Classroom Environment Scale
CT	Class Time
DTES	Down Town East Side of Vancouver
EFF	Electronics Frontiers Foundation
ENIAC	Electronic Numerical Integrator And Computer
IUCN	International Union for the Conservation of Nature and Natural Resources
LEI	Learning Environment Inventory
LEMP	Lu lax kyook Ecological Monitoring Project
LMS	Learning Management System
MCI	My Classroom Inventory
PAR	Participatory Action Research
PDP	Professional Development Program
PLACES	Place-Based Learning and Constructivist Environment Survey
PLE	Preferred Learning Environment
PRMS	Prince Rupert Middle School
SFU	Simon Fraser University
WEBLEI	Web-Based Learning Environment Inventory
ZPD	Zones of Proximal Development

Forward

Personal History with Education

Throughout my life I have had a diverse and complicated relationship with education. Part of this arises from my almost nomadic life from age 13 to 25 when my family moved from Burnaby to the Washington State and eventually California. My transition from the Canadian educational system to the US educational system was not a good one for a variety of reasons. Not the least of which was my almost debilitating social anxiety in conjunction with a very cliquish sports orientated school environment in Washington which was also strikingly anti-Canadian at the time. While the school environment in Washington was toxic for me it was better in California with regards to anti-Canadianism. Being Canadian in California was actually a bit of a novelty but interestingly, going to school in a primarily white middle class environment, the xenophobic attitude towards California's bordering country of Mexico was high. However, my social anxiety did not fare better in a high school with close to 2000 students. I was never able to connect with my learning environment and usually felt ostracized from it. My grades were poor and I failed a number of courses. Thus, when I was about half way through my 16th year of life, I decided to stop going and became a "drop out". Yet my mother was never going to let one of her children not have a high school education and she enrolled me in a burgeoning distance education program in 1996 which was mail, pen and paper. With the support of both my parents I managed to get my High School Diploma a bit early as the program was self-paced and I finished it quickly.

I then transitioned to post-secondary. My experience with education changed when I began to go to Fullerton Community College in 1998. Being a college environment there was less cliquishness since students were of diverse ages, backgrounds and social locations. It was at this point I began to realize that one's

learning environment was a significant contributor to one's success. In 1999 I went from California to Vancouver to Capernwray Bible School in Sweden with my cousin. I spent a year in Sweden and traveled around Europe in hostels and with trains. While the bible school learning environment was intellectually limiting, the social environment had a positive affect on my social anxiety and I began coming out of my shell. Additionally, seeing the world from a different socio-cultural viewpoint through my travels significantly changed who I was and my worldviews. Upon return from Europe I went to Orange Coast College in Costa Mesa, CA for a year and then proceeded to travel around the American south west and eventually moved north to Portland where I had met some people. I spent a year in Portland and went to Portland Community College where I began to excel in the post secondary environment. After a year in Portland, and a short stint in Seattle and Bellingham, I nomadically decided to move back to my "homeland" of Vancouver and BC where I slept on my cousin's couch for a couple months. It was during this time that I met my lovely wife and began to settle down. I spent a year at Capilano College, now a University, had my first child and transferred to SFU, where I eventually attained my BA in English/Humanities and a B.Ed.

It was this long and winding educational road which brought me into the field of education. I had such a horrible high school experience and received such poor grades, not because I was incapable, but because the learning environment in no way responded to my needs. It was the learning environment of my social network and the learning environment of post-secondary which transitioned me from an underachieving child with severe social anxiety to an engaged adult with the capacity to rationalize and deal with my social anxiety without medication or drug addiction. Thus in the final year of my BA I decided I was going to pursue the path of an educator with a specific goal of formulating learning environments which were non-traditional and would engage a myriad of different learners.

Philosophical Learning Environment

While all the post-secondary institutions had an effect on me, none had a bigger effect on my world view and epistemology than SFU. Being a student of the English and Humanities department of SFU introduced me to a very "left wing" world view. My family background was of a conservative Mennonite tradition. My grandfather Leo Janz was a

Mennonite evangelist who began Janz Team Ministries[1] in Germany which went across Canada and into South America and Brazil[2]. My mother was the first student at Black Forest Academy, a popular Anglophone missionary K-12 school, which was started in my grandparents' two bedroom flat in Basil, Switzerland[3]. The other side of my family came from simple Manitoban farmers who were "good God fearing Christians". I was sent to bible school with my cousin, as mentioned earlier, and spent a year at Trinity Western University. However, as with High School, I never deeply connected with the conservative Christian learning environment or worldview. Once in the SFU English and Humanities departments I was exposed to literature and ideas which further shifted my perspectives away from a modernist Kantian worldview towards a post-structuralist one and beyond. Authors like Lord Byron, Shelley, Goethe, Dickens, Orwell, Ondaatje, Shakespeare, Alice Munro, Margret Atwood, Swift, Voltaire, Steinbeck and Thomas King. Philosophers and political theorists like Foucault, Lyotard, Derrida, Deleuze, Lacan, Saussure, Marx, Judith Butler, Rousseau, Naomi Klein, Bill Mckibben, Žižek, Bakhtin and Chomsky. During this time I also became fascinated with both Hinduism and Daoism. All these thoughts, perspectives and ideas, plus a myriad of others, rattled around in my head and transformed my perceptions of the world and my place in it.

While I have had many influences on my life none is as great as Nietzsche. One of the biggest misunderstandings of Nietzsche in our time is that he is, or was, a nihilist. It is not that Nietzsche believed in nothing, or even promoted that idea. It is that he opened the door to anything. He tore down all the pillars of society, not to keep them in rubble, but to give hum-nity the space to build new pillars radically different in order to move towards the Übermensch; moreover, those pillars can yet again be torn down and rebuilt *ad infinitum*. Thus, it is not that there are no values or no standards, no pillars even, but that no "God/god" nor institution, no economics nor culture, no government nor politics has an *a priori* claim to dictate it's metanarrative on everyone else. In the words of Friedrich Nietzsche, in Aphorism 343 from his book Die fröhliche Wissenschaft or The Cheerful / Happy / Merry Science, a decidedly non-nihilistic title:

[1] Now called "TeachBeyond": http://teachbeyond.de

[2] http://www.janzteam.com.br

[3] http://bfacademy.com

Indeed, we philosophers and "free spirits" feel, when we hear the news that "the old god is dead," as if a new dawn shone on us; our heart overflows with gratitude, amazement, premonitions, expectation. At long last the horizon appears free to us again, even if it should not be bright; at long last our ships may venture out again, venture out to face any danger; all the daring of the lover of knowledge is permitted again; the sea, our sea, lies open again; perhaps there has never yet been such an "open sea."

– Friedrich Nietzsche, Aphorism 340, Die fröhliche Wissenschaft, 1882

It must be noted that Nietzsche shifts to the lower case "god" at the end of this aphorism. The idea of god thus becomes a metaphor for any metanarrative that claims *a priori* truth. Having grown up in a hyper Christian conservative worldview where "God's" *a priori* metanarrative was thrust upon me since birth, this single aphorism represents my radicle breath of fresh air from the stifling mental oppressiveness of religious metanarratives. I never looked back.

The way forward for me was to become involved in the social justice movement of Harm Reduction and the global Eco/Social Justice movement. I began the Canadian Students for Sensible Drug Policy (CSSDP) SFU chapter and helped organize and lobby support of Vancouver's *Insite* and marginalized residents of the DTES. This along with my work in Eco Justice, and my time in the English and Humanities department, has given me a decidedly anti-capitalist worldview. It was during this time that I became interested in the late 19th century Anarchist writings of Bakunin and Kropotkin. In particular with Bakunin's idea of "mutual aid" which restructured much of the capitalist interpretations of Darwin and "survival of the fittest" coming out of western political thought. I was most fascinated with the idea of "communist anarchism" or social anarchism which comes out of Bakunin's writings and interpretations of evolution and its relationship to hum-n social organization. From Bakunin's perspective, while there were elements of competition and survival, there was much more evidence to suggest that all animals live in a network of mutual support, what we might now call an ecology. Thus social organization should be structured through community orientated interdependencies where political and social power flows from the bottom towards the top; this contrasts with the top heavy power structures of western society and capitalism whereby everyone claws and kicks to be on top of the social pyramid. In a way social

anarchism could be seen as the other side of the coin to capitalism where capitalism is an individualist anarchism rather than a social anarchism.

Becoming a Teacher

Thus my worldview became structured around Nietzche's idea of building new social pillars from the ground up and community orientated democracy through social anarchism. My willingness to redefine the pillars of our social metanarratives has become the lens through which I interpret our current social inequalities and the ecological crisis of our time. It is this passion for redefining embedded social metanarratives, combined with my tragic experience with the embedded metanarratives of the traditional school learning environment, which drove me into the teaching profession. Thus I applied to the SFU PDP program and began my journey to certify as a teacher in BC.

Since my passion was how to do things differently, in conjunction with my zeal about promoting local ways of being, I decided to enrol in the Indigenous Pedagogy PDP module. It was here that I began learning about indigenous pedagogical models. The ideas of restitution, respect for the land and elders, experiential learning and teaching in a holistic way were inspirational to me. This module also inspired me to look for opportunities to work with the indigenous populations of BC to learn more about cultures which were imbedded in [place] since time immemorial.

In addition to being enamoured with indigenous pedagogies I was a vehement supporter of the eco justice movement and, for lack of a better word, environmentalism. Books like John Bellamy Foster's "The Ecological Revolution" (2009) and Joel Kovel's "The Enemy of Nature" (2002), along with a life long love of the "out doors", hiking, "off-roading" and nature in general, inspired me to take the Environmental Minor for my B.Ed. during the summer of my PDP. It was here where I first met David Zandvliet and was introduced to the [place]-based educational model. Zandvliet's course design and learning environment structure opened me up to a completely alternative way to design learning which was immersive, engaging, critical and generative. To use our Nietzschean pillar metaphor, Zandvliet helped me raise up a foundational pillar amongst the rubble of my disenchantment with the traditional primary/secondary school model

and elements of the post-secondary model. In addition he introduced me to one of my most influential [place]-based / ecological educational theorist Chet Bowers. While a lot of other influences will be mentioned throughout this thesis, Chet Bowers remains one of the most influential theorists on my pedagogy.

The only other author to equal Chet Bowers in pedagogical influence would be the work of Paulo Freire and his book "Pedagogy of the Oppressed" (1968). Along with Bowers, Freire is emblematic of Nietzsche's call to dismantle the metanarrative pillars of society and restructure them in a way which promotes a redefinition of being hum-n and thus moving us towards becoming Übermensch, or more than hum-n[4]; in other words, Bowers and Freire push hum-nity to become more than it already is by challenging institutional assumptions and shining a light on embedded cultural structures which are destructive to the flourishing of hum-nity. Moreover, both of these authors seek to institute what could be considered a social anarchist model where by the curriculum and educational authority is radically decentralized and rises up from the [place]/community in which it is embedded. Thus, pedagogically speaking, Bowers and Freire are the most influential theorists on my pedagogy because it functions within my worldview.

These pedagogical rumblings in my mind from Zandvliet, Bowers and Freire combined with a creative writing course I took at SFU with Jeff Derksen where I read a book called "Landscapes of Dissent: Guerrilla Poetry & Public Space" (Boykoff & Sand, 2008). This lead to the creation of my final project for Zandvliet's Environmental Education minor. My project was an attempt to antagonize the embedded corporate capitalist curriculum structured into the fabric of Vancouver. Thus, rather than confining the learning environment into the school, I expanded it to be representative of the whole texture of our environment. This was accomplished by putting up posters, signs and leaving images and poetry on transit, coffee shops which filtered throughout the downtown core of Vancouver. The educational moment being the disruption of the embedded learning environment through an interaction with something that challenged it. I eventually expanded on this in an inspirational course taught by Milt McClaren[5]. The

[4] Translation of *über* and *mensch* from Langenscheidt's Pocket Dictionary: German published 2000.

[5] SFU - EDUC 830 – "Implementation of Educational Programs" in the Summer of 2014.

end project for this course was to either present a possible implementation, or to actually implement, an educational program which, on some level, focused on the agency of change within the learning environment. For my project I hooked up with an East Van art collective and we implemented a guerrilla “public living room” on the corner of Davie and Burrard in Vancouver. This took the project I did for Zandvliet during my B.Ed. to a whole new level where people actually entered into a live alternative learning environment which actually disrupted the embedded learning environment in which the event was situated.

I mention these two projects because they are emblematic of my pedagogical purpose. Education does not just happen in the silo of the classroom or school or district. Education is not the sole purview of the government in power or its bureaucracy. It is happening all around us at every moment, whether in the home with our family or friends, while driving, walking, biking or transiting to work, at a community event, when we go to the movies or play a video game. Thus, if a community, be it global or local, want things to change they must make a concerted effort to change parts of the very essence of its [place] and (space) which are facilitating behaviours deemed destructive or disruptive; moreover, education should push a person into praxis, to use a term from Freire, with their [place]. These are the core pedagogical assumptions out of which my courses rise. The outlook is that the curriculum itself is the [place] and the [place] is the curriculum.

Chapter 1.

Introduction

1.1. Stories

Learning in high school never came easy to me. The social anxiety – the angst – the depression. Everyday hit me hard like this ferry smashing into the waves at 30 knots in Wright Sound. My mind and body swirled like the currents and tides colliding into these tumultuous waters. Moreover, I was about as interested in what I was learning as the wind on a foggy day in The Bay. Rain and salt water hits the window as we ride from the Grenville Channel into The Pass. The Douglas Channel comes into view and then, suddenly, a village … and I think … "so what can I offer these isolated kids off the north coast of BC? I hated high school."

What does it mean to be in place?

…

"So what about after school?" he anxiously asks.

"Well I don't know. How far do we have to go?" I cautiously reply.

Pleadingly he states, "Its not far. Just a ways up the river. And there is lots of salmon right now. But they will be gone soon!"

You see, I'm a big city kid. I grew up between Vancouver and LA … and nomadically in between. I finished my teacher training about 2 years previous and had been teaching and TTOCing in the Delta school district for those 2 years. Now I'm in the

most remote place I've ever been in my life and a student has been asking me for 2 months to go alone with him into the bush and fish after school. From my big city perspective my natural inclination is to have a strong separation between my professional teacher/student life and my personal life. Yet after two months living with the *Gitga'at*, I'm beginning to question this particular construct of "professionalism".

"Ok. Sure. But I need a rod and what time were you thinking…"

And with that relent it began. My integration into a thing called ?place? … such a clunky word. I didn't catch any fish that day. But my student caught 4 Coho salmon. He then proceeded to teach me how to gut the fish. Suddenly I was the student and he was the teacher. I was giddy and gleeful.

"Heh. I like fishing with you Mr. Janz. You're so happy. Most people are so serious when they fish" he said, responding to my unusual fishing decorum.

"Well I guess this is just all so new to me. Its exciting."

Place…?

…

The 13 foot skiff bounces through The Pass. We're going out to The Rock. Gonna set straight out from the shore towards The Rock. Stan used to get king crab out here when he was a kid. He just finished building a king crab trap which takes up about two thirds of the boat. Suddenly the boat slows.

"Hey. Look at that Jeremy. *Genti*" he joyously sings. *Genti* is the local term for Giant Red Sea Cucumber. Its low tide and the rocks are littered with them. Literally hundreds. Probably thousands.

"Wow. I can't believe that", I stutter in amazement.

“We will get some on our way back. That’s good Indian food. My grandmother used to cook it.”

The boat speeds up and we come to our setting spot. Stan directs me to jump off the boat and secure the rope to the shore. Not too high up the shore though. You want to hide the rope in the tides just in case some nefarious soul comes and takes what’s in your trap.

“Hey. Grab two sticks Jeremy. Nice long ones. With some strength” he yells over the waves and engine. I secure the rope, grab some long sticks and jump in the boat. Stan heads slowly towards The Rock while I let out the rope. At the end of the rope we throw the trap over board.

“*Wahe’chwa*” his vocal chords ring in time with the splash. As the trap sinks Stan goes to work on the sticks with fishing line and hooks.

“We’ll use this to catch the *genti*”. Stan shows me an expertly fashioned hook inset into the stick with a knife and tightly wrapped and tied fishing line.

“So what you do is stick your stick in and hook the *genti* with a slight jerk. I’ll show you and then you do it.”

I’m yet again the student. Learning the traditional Indian way. By watching; then doing. I watch as Stan expertly drives the boat and hooks *genti*. It’s a bit of a delicate process and the water plays tricks on your eyes. Luckily the Giant Red Sea Cucumber don’t move fast. In fact they pretty much don’t move at all. Suddenly the *genti* are jumping in our boat left and right. We can’t get them fast enough. Its as if the ocean spirit controls our sticks, our minds, our hearts. The *genti* were beyond count.

And the king crab … man the king crab. We could barely pull up the trap. They were falling out. Back into the depths. Overflowing king crab. Our bellies and freezers thanked us. We thanked the ocean.

…

My students are spread out. All over the village. Speaking with their elders. Looking at maps. Understanding their territory. I walk up the stairs and knock on Jimmi's door. Stan lives here as well. A voice prompts me to come in and I proceed through, up some stairs and into the kitchen where two students, an audio recorder, and Jimmi hover over a map of Old Town. Jimmi looks at me quizzically.

"This is my teacher. Mr. Janz" my student pipes up attempting to allay her grandfather's questioning. She turns to me, "This is my ye'es. Jimmi."

"Hello. Its great to meet you and thank you for your time."

Jimmy smiles and nods, then looks at his granddaughter and asks "*k'amksiwah*?"

"Yes" she replies, a bit embarrassed. *K'amksiwah* means white man or European Canadian. Its not a derogatory term but its not endearing either. Jimmi's tone was generally inquisitive. Noticing a bit of tension I enquire as to how it is going and make conversation with Jimmi and the students. The students show me the harvesting and historical locations they have been marking on the map in their talks with Jimmi. He was a long time commercial fisherman and knows these waters better than anyone. The map is littered with places for salmon, crab, prawns and halibut. There are also some sites for moose, seal, bear and beaver. After we discuss their progress I leave. My feet pounding the boardwalks to Helen Clifton's house.

Helen is the matriarch of the village; her husband, who is no longer with this world, was the hereditary chief. She is very important to this village. Helen has a degree in social work and was on the forefront of progressing both women and indigenous rights in Canada. As I walk in the students are engrossed in a historical tale of how the Gitga'at would ask permission from the cedar tree before they stripped its bark.

"Hello Mr. Janz." Helen always insists on calling me Mr. Janz. But I'm told by everyone that she calls me "Janzie" when I'm not around.

I begin conversing with the students and Helen about what they have been researching. Helen has been outlining berry picking and sea weed harvesting spots. She also talks about the traditional roles of men and women in Gitga'at society. The men generally went out to fish and hunt while the women would harvest berries, plants and seaweed in addition to cutting the fish. The maps strewn out over the dinner table have clusters of sticky notes with harvesting locations.

How now to define place?

…

"Hey look. There it is." Suddenly a rifle is being shoved into my hands. I don't have a gun license. I don't have a hunting license. But this is Gitga'at territory. I'm with them on their land.

"Be steady and shoot on your out breath." My heart races before I pull the trigger and BAM. Death's scythe blasts forwards, rattles off the surrounding mountains and splashes innocuously in the water before us.

"Where were you aiming?"

"At its head."

"No, no. You aim at the waterline where the head will be. You're also on a boat which doesn't make it easier."

This was my second shot. Bunker and Nichole have taken me to Old Town to go hunting. There is good Moose and Seal there. Its about a 45 minute boat ride east on the Douglas Channel towards Kitimat. This is the true home of the Gitga'at. Where they have resided since time immemorial; where they built an island to hide the women and children from Haida raiders; where they carved petroglyphs into stone. This is their land. And if they say I can hunt, I don't need any sanction from a foreign government.

“We’ll have to move on. That seal will not be showing its head any time soon. You damn near took it off” Bunker says with a final chuckle.

After a couple hours around Old Town we now move back towards Hartley Bay. About half way between Hartley Bay and Old Town is a place called Kishkosh. Bunker thinks I might have some luck there. But the tide is on its way down and both Old Town and Kishkosh are known for their long shallows which can dry up during tides, especially big tides. As we ride into the inlet we see a seal in a matter of minutes. Nichole hands me the rifle.

“Remember! The water line where the head WILL be. Not the head”

I settle in on the side of the boat. It rocks slightly with the waves. I start looking for the seal’s head to pop up. Half of hunting is about patience. Waiting. Then waiting some more. My left elbow rests on the boat as I hold the front of the rifle. My right hand flicks off the safety and hovers around the trigger.

“Come on. Where are you?” I mutter to myself.

Abruptly a seal head pops out of the water. My companions quietly vocalize and I aim for the kill. Breath in. Breath out. Aim for the water line … time … slows … its watching us watching him … Breath in. Breath out. MyHeartRacesAndBAM! … more than a splash.

“You got it!”

Bubbles and blood. Bubbles and salty blood. Bunker goes into over drive. When hunting seal in the ocean you don’t have long. If you are not quick you will lose the seal to the depths as the body sinks. There goes your skin. There goes your fat. There goes your meat. There goes your bones.

So why not just shoot the seal as it lays on the rocks? Wouldn’t that be easier? Initially yes. But there are consequences. The spirit of the north wind and the spirit of the

ocean will be upset at the sight of such blood. They will bring forth wind, rain and tumultuous seas in order to wash the blood from the rocks. If your subsistence and livelihood comes from the ocean then it behoves you to not piss it, or the north wind, off. Thus you never kill a seal on the rocks. Only in the water. Really its about respect for the seal. It has no chance on the rocks outside of its natural environment. It's a cheap shot which disrespects the natural order of things. So if your going to hunt a seal, never kill it on the rocks. You will bring misfortune.

But we did not bring misfortune. It was a good clean kill. We raced up to it and Bunker accidently bumped it with the boat.

"Shit!" he cursed.

"Its ok I think I got it … Damn it slipped"

"Grab the gaffing hook"

"Fuck! Its sinking" I curse, seeing my honour sink. I damn near jump into the ocean with the gaffing hook. A hand catches my foot.

"Got it!" The gaffing hook slid in nicely and I pull it up to the side of the boat as Bunker pulls my foot. A collective cheer rings out. A release of energy and tension. A job well done. Well, a start of a job well done.

Bunker suddenly get serious. "So is this your first kill?"

Proudly beaming I declare "Yes it is".

Bunker stares at me intently "Well then you have to drink the blood."

I chuckle a bit in his serious face "Yeah … right. I'll get right on that."

"Its tradition. You're a hunter now. You have to drink the blood." Bunker's eyes are dead serious. And now I'm getting nervous. I can't see Nichole to gage her.

“Look man … I’m cool with tradition and all … but … like … I don’t know … I mean …” now Bunkers lips start to crack and Nichole busts out laughing.

“I’m just kidding but you’re going to have to bleed it and gut it here and quickly.”

I had shot the seal right through the eye. It was clean and quick. What struck me most was the red warmth. The warmth in such cold water. Bunker directed me, taught me. What to cut and what not to cut. How to salt it and smoke it. How to skin it, which I totally butchered much to my dismay as I wanted to do something with the pelt. Yet the best part was at the very end. Once the seal meat was smoked I portioned it out and handed most of it out to the elders. This was in keeping with tradition, and protocol, but more than this it was the most uplifting thing to bring the elders seal meat which is coveted by the them in the village. I gained a glimpse at how proud the hunters must have felt coming back to the village after a good hunt.

This is certainly not a place. It’s [place].

…

What these stories represent is learning from [place], not “a place”. In all of these stories I was the student and [place] was the teacher; whether [place] manifested itself through a student, elder or the very landscape itself. The absence of [place] is the point at which my tumultuous time in high school failed me. I was dislocated. Disconnected. Dis-- … and to approach my earlier question from the beginning of this chapter, [place] is what I wanted to offer my students. Not in the sense that I was saving them from something, or even brining something new, but rather I wanted my curriculum to reflect *Gitga’at* as much as possible in an effort to honour both the students and the culture. I wanted progress their love of [place].

But what is with my brackets? Why [place] instead of “a place”? Academically I come out of SFU’s English and Humanities departments. It was through those departments that I was exposed to post-structuralism and in particular Derrida’s concept of différance and the Russian literary movement of defamiliarization. Both of these, along

with the poet and SFU Professor Jeff Derksen, had a profound effect on how and why I write. Put simply, through the shifting of textual elements and how text traditionally performs on the page, the familiar becomes defamiliar, the traditional becomes (non)_tRADitIonAL --> RADIAL symmeTRY

In-gENDers new

meaning…

In the words of Viktor Sklovski (1917), who was the first to put a definitive theory behind defamiliarization, "The purpose of art is to impart the sensation of things as they are perceived and not as they are known. The technique of art is to make objects 'unfamiliar', to make forms difficult, to increase the difficulty and length of perception because the process of perception is an aesthetic end in itself and must be prolonged" (1917); so it is with words themselves. They become overused, opaque, diffuse … lost in the abyss of différance. Take the word "good" for example. I do not accept this word from my students. Someone could be having the worst day of their life and you ask them how they are and they say "Good. And You?". It's automatic. It's cultural. It's maintaining social decorum and expected communication. Taking Derrida into consideration, the word "good" is defined by what it is not; and it is primarily not an accurate representation of how one is feeling yet linguistically, even socially, the word performs in that way.

Primarily the shifting of a-place to [place] is a linguistic question between the signified and the signifier. Defamiliarization is really a subset of différance or the radical decentering –delaying- (deferring) of meaning (Derrida, 2005, p. 254-255). Signifiers are defined by their difference to everything else and that difference is constructed through a set of prior phenomenological experience. Derrida writes:

> Henceforth, it was necessary to begin thinking that there was no center, that the center could not be thought in the form of a present-being, that the center had no natural site, that it was not a fixed locus but a function, a sort of nonlocus in which an infinite number of sign-substitutions came into play. This was the moment when language invaded the universal problematic, the moment when, in the absence of a center or origin, everything became discourse—provided we can

> agree on this word—that is to say, a system in which the central signified, the original or transcendental signified, is never absolutely present outside a system of differences. The absence of the transcendental signified extends the domain and the play of signification infinitely. (2005, p. 353-354)

Thus when I write I desire to push my reader to deconstruct the text in order to draw out fresh new constructs of differences through a process of decontextualizing, or possibly (re)contextualization, in which meaning becomes both personal yet common, but never static. The concept of [place] is a central part to this thesis. The stories above relate a process of (re)contextualization of "a place" to [place]. The word place should be defamiliarize by writing it a-place. The signifier "place" has no essence, no locality; thus a-place instead of the-place. In other words, the meaning of the signifier "place" is deferred into complete abstraction. "Place" could mean some where you have never been or even heard of, like Schuchinsk in the Akmola Province of Kazakhstan. It is a "place"; or your bedroom, it is a "place"; or that place you flew through once on your way to that place, it is a place. Thus I bracket place to defamiliarize and decontextualize its differences because Schuchinsk in the Akmola Province of Kazakhstan is not a [place] for me, or most likely most of you reading this; however, it is a-place.

This is a common thread within my writing and does not just happen with [place]. When I discuss the chronotope, (space) or hum-n I am attempting to, as Sklovski puts it, "increase the difficulty and length of perception" in the hopes that the reader will deconstruct the "play of signification infinitely". In this way I intend to force the reader to engender new patterns of signification and thereby enhance meaning and understanding.

1.2. Why this Project? Why this School?

I remember walking into Ernie Hill's principal's office one day to chat as he was finishing up an email. I sat down, he finished up and chuckled a bit. He told me that he had another request to do some research at Hartley Bay School but that there just was no space, time and, quite frankly, he didn't like the idea of an unknown person tromping

about and analysing everything. Remote indigenous communities can be challenging to do research in especially with no connection or understanding of the culture and people. Indigenous peoples have been studied many times before and the outcomes have many times been disastrous for First Nations people. Some examples would be the Nutrition Experiments, the Ryerson Experiment, the Davin Report, systematic involuntary sterilization and in general the development of scientific racism and eugenics (Grekul, Krahn, & Odynak, 2004; Hammonds & Herzig, 2008; Nishnawbe Aski, 2016; Battiste, 1998; Shuchman, 2013; Richards, 2000). Western centric metanarratives collided with indigenous ways of being (Wilson & Harris, 2005, p. 142-143). Thus, indigenous peoples tend to be naturally wary of unknown academics and researchers. As such my presence and deep connection with the school provided a great opportunity to do some respectful research on a remote indigenous student population.

Yet more than this Hartley Bay School is the perfect environment to do some innovative curriculum implementation. As I articulated previously, while I enjoyed working in the Delta School District, it is hard to implement a truly innovative [place]-based learning environment without going through a lot of bureaucracy and red tape. In Hartley Bay, if I wanted to take the students to the Fish hatchery I would just say “Hey, going to take the kids to the hatchery today” and the response is “Ok. Sounds good.” I have always joked that teaching there was like going back to the 70s.

I also found a lot of support by the administration and community. When I initially brought my research proposal to Cameron Hill, who had taken over the principal position from his dad Ernie Hill, his response was “Alright, whatever you need, we’ll get it done” and was very encouraging. Helen Clifton, the village’s matriarch, was exceptionally supportive and excited about my integration of elders and traditional knowledge. Ernie Hill, chief of the Eagle Clan and former principle, was particularly excited about my integration of technology and media arts as this had been a passion of his. Yet the best part was the fact that I had essentially carte blanche to do what I wanted with the full support of the community and school.

With this support I began to develop my research questions:

1. How do indigenous communities and students perceive learning environments?
2. Does the addition of modern technological tools foster engagement and encouragement within remote indigenous communities?
3. Can the combination of [place]-based and technological learning environments incorporate indigenous perspectives and enhance student performance?

This in turn helped me develop the curriculum backdrop which became the *Lu Lax Kyook* Ecological Monitoring Project. The idea behind this project was to create an immersive [place]-based cross-curricular learning environment which utilized the community and its people as the educative (space) rather than just the classroom and textbook. The Hartley Bay Community represented an ideal (space) in which to do this. The community and Band Council is already closely connected to the school; moreover, traditionally for the *Gitga'at*, education was a community processes where the uncles and aunts traditionally took on the role of educators along with the elders. Thus, due to the willingness, openness and social environment of Hartley Bay, this school represented an ideal [place] for me to implement my study. I will be going more in-depth on the development and process of the *Lu Lax Kyook* Ecological Monitoring Project in Chapter 3.6.

With this study I hope to give both the *Gitga'at* people, and those outside, insight into the perceptions and effectiveness of a [place] centric and technologically based learning environment. It should be noted that the school is run by Giga'at faculty and elements of a [place]-based learning environment have been present for many years/decades prior to my arrival; however, the implementation of a technological core through the use of media arts and computers, as well as a systematic attempt to collect baseline data in conjunction with the *Gitga'at* Guardians, had never been done. Additionally, Ernie Hill, who was Principal my first two years in Hartley Bay, and is chief of the *Gitga'at* Eagle Clan, had a dream that media visual arts, technology and *Gitga'at* culture could be used as a tool for education and culture enhancement. Thus, credit for this study must be given to *Snaxeet* (Ernie Hill) for his inspiration.

The following chapters will guide you from the philosophical and theoretical core of its implementation towards the act of implementation and into the final conclusions of the study. In Chapter 2 I will focus on a literature review and my philosophical interpretations of a [place]-based pedagogy, learning environments research, epistemological structure and technological learning environments. Chapter 3 will focus on the methodology of the study while chapters 4 and 5 will hone in on the results: chapter 4 focuses on the primary data set of the surveys and interviews; while chapter 5 hones in on the secondary data collected like statistical results from Google Analytics in addition to anecdotal journal entries and observations. Finally, chapter 6 will present my interpretation of the study, while discussing its limitations and implications for practice.

Chapter 2.

Literature Review

2.1. Indigenous Worldview and Tensions with Traditional Educational Models

The basis of this research takes place in the remote village of Hartley Bay which is home to the Gitga'at nation who are part of the Tsimshian people. Thus discussing the generalities of an indigenous worldview is important to understanding how this thesis research, and the curriculum it studied, was conducted. While a broad and complicated topic, I will do my best to highlight the main themes in addition to some of the tensions between an indigenous worldview and the traditional Eurocentric western worldview.

As previously noted I am a white middle class male who grew up in a Mennonite/Protestant Christian worldview and was eventually heavily influenced by the post-structuralist/modern writers of contemporary philosophy and the philosophy and mysticism of Daoism and Hinduism. Daoism was of a particular interest to me and I organized a Humanities 390 Directed Studies course with SFU Professor Dr. Paul Crowe in the Summer of 2009. Yet all of these worldviews had a distinct lack of North American indigeneity to them. It was because of this that I decided to enrol in the Indigenous Perspectives Module for my PDP at SFU in 2010. I wanted to understand the Indigenous worldview better; moreover, I was most interested in the worldviews of British Columbia's indigenous population.

While not from BC, Thomas King does a great job at characterizing all worldviews in general with one simple sentence*: The truth about stories is that that's all we are* (2003, p. 2, 32, 62, 92, 122, 155). Worldview can be boiled down to the stories

we tell ourselves about ourselves. Neither one is any more valid than the other but each one will create a set of social, economic, environmental and spiritual structures to how society functions. This is the main thrust of King's book *The Truth About Stories* (2003). The entirety of the book does not demand the validity of one worldview over the other, but rather, it asks the question: What kind of society do you want and how do we change our stories to create that society?

This relates to a particular construction of an indigenous perspective where truth is somewhat malleable. The elder Keeper in a novel by Richard Wagamese (1996) called *Keeper'n Me* grabs on to this idea of truth when discussing the Europeans bringing "The Great Book of Truth"; the Keeper states "Us we never knew truth to be somethin' had to be spelled out. Always figured was somethin' we each carried around inside. True human bein's got that. Truth inside" (p. 107). Such a statement would rub European philosophical traditions of rationalism and empiricism the wrong way. While both epistemological traditions view the processes of gaining truth separately, they both claim that truth is outside the individual either through logic (rationalism) or experience (empiricism). Wagamese's elder in his story articulates how this European worldview clashed with their worldview and cause great pain (2006, p. 107-112). This indigenous idea of truth being less static and more personally, or socially, constructed could be connected to the oral tradition of indigenous cultures. King (2003) goes to great lengths throughout his book to articulate that oral stories never stay static but shift and change; moreover, while the core morals or lessons of the story generally remain the same they can also shift to reflect the changing realities of the world. King (2003) performs this through his writing and continual retelling of the same creation story but with subtle changes and tweaks which layout the overall topic of the chapter (p. 2, 32, 62, 92, 122, 155). The Gitga'at are still very connected to their oral cultural roots. Ernie Hill, who is Chief of the Eagle clan, discussed with me, and my students, many times how the Chief of a clan has two speakers. It is the job of the three of them to guard the stories, or *Adaawx,* which are specific to their clan and the community as a whole. The *Adaawx* which are specific to their clan are only allowed to be told by those authorized and trained to do so. The two speakers are in training and the Chief, in this case Ernie Hill, trains them to become the story tellers. This is how history was passed down for

thousands of years (E. Hill, personal communication, 2012-2015). These *Adaawx*, and the process of its transfer, represent the collected works, the Library of Alexandria if you will, of the Gitga'at and Tsimshian people.

The importance of the oral tradition within indigenous cultures is express by King (2003) through centring the entire book around the various retellings of a North American creation story "about the earth and how it floats in space on the back of a turtle" (King, 2003, p. 1). Throughout King's (2003) book he relates the importance of the oral tradition and its effect on indigenous worldviews. This theme is present in many North American indigenous writers. In Wagamese's (1996) book *Keeper'n Me* the protagonist learns to be the "Keeper" through an oral tradition. Cajete (1994) discusses this worldview and the importance of the oral tradition as both learning and culture forming (p. 52-54). The Navajo called language the "Holy Wind" and this concept is embedded into their creation myth (Cajete, 1994, p. 52-53). Likewise with the Giga'at people the oral tradition is integral to their culture, heritage and territory. They trace their migration history from the Skeena River to the Douglas Channel through the oral tradition of *Adaawx*, which is translated as "truth telling" (E. Hill, personal communication, 2012-2015; Clifton, personal communication, 2012-2015; Adaawx). These oral stories not only told history but set the physical structures of Gitga'at territory in relationship to other First Nations Bands and the *Adaawx* has been used in Canadian Courts to define traditional land rights (Marsden, 2002; Vickers, 2008). Much of what I did while a teacher in Hartley Bay was to integrate the oral tradition into the curriculum through the use of elders and community members telling stories to the students. You will see this in the *Lu lax kyook* Ecological Monitoring Project where we talked to elders about Traditional Ecological Knowledge (TEK) through oral stories both historical and mythological. For example, the estuary where the monitoring project took place is also a "boat graveyard". Elders talked about how boats would be run up and beached on a high tide. They would then take all the fuel, oil and other none biodegradable materials out. The boat then sits there to decay and go back to the earth. Elders talked about personal histories of harvesting in *Lu lax kyook*; additionally community members through the Gitga'at Guardians showed harvesting techniques which the students emulated thus

learning through doing (Janz, 2015; Janz, 2016). These are all indigenous pedagogical techniques which you will see embedded into the curriculum which this thesis studied.

While the oral tradition is an important component to the indigenous worldview it is only one component to the intricate and developed worldviews of indigenous peoples. Cajete (1994) does a great job at creating some broad philosophical strokes about the collective structure of the indigenous worldview. This is not to suggest there is not variance, differences or disagreements but rather that Cajete manages to capture the general themes and tropes of indigenous worldviews. One important perspective is the sacredness of nature and its permeation of everything (Cajete, 1994, p. 29). This can certainly be seen in King's (2003) initial retelling of the Turtle story where he does a comparative analysis between the Turtle creation story and the Christian creation story (p. 1-29). In the Turtle creation story everything is centred around nature, chaos and natural elements; while the Christian story is centred around an orderly God that is outside nature in heaven and an earth that is corrupt and needs saving. In this way King explores the tensions between the Christian European worldview and the indigenous oral worldviews about nature. Indigenous pantheism is explored by Wagamese (1996) when the protagonist talks about Midewewin who are the guardians of the people (p. 98). They are the elders, teachers and medicine men who spin legends to teach the people and know "all about plants and animals, all the teachin's that come from there" and had a real "natchrel" [sic] worldview (Wagamese, 2006, p. 98). This is also very present with the Gitga'at people and their traditions. Helen Clifton, matriarch of the village and mother of the hereditary chief, told my class a story of when she first went bark stripping. Before they stripped the bark from the tree they would thank the tree, express sorrow for any hurt the tree would feel and then ask permission from the tree to strip the bark. This was all communicated in Sm'algyax. There are many other examples of the deep connection between nature and worldview, including the myth about seal blood on the rocks I talked about in sub-chapter 1.1.

Another common theme within the worldview of indigenous people is what has become known as the four Rs or what the Anishinaabe call the four directions: Respect, Relationship, Reciprocity and Responsibility (Bell, 2013, p. 90; Evering & Longboat,

2013, p. 246). The idea of respect, in particular for elders, tradition, self and nature, is strongly embedded in the indigenous worldview (Wagamese, 2006, p. 114; Cajete, 1994; Bell, 2013; Evering & Longboat, 2013, p. 245-247). The concept of respect is about "re-spect, to look again" (Bell, 2013, p. 97). Thus one considers what has happened and possible avenues for change. Relationship is the idea that everything is interwoven into a web of connection and interdependencies (Bell, 2013, p. 99-100; Evering & Longboat, 2013, p. 247-248). Reciprocity is the idea of living in balance with both the past and future through giving back and/or thanks to either the environment or community (Bell, 2013, p. 101-102; Evering & Longboat, 2013, p. 248). Finally, responsibility is about realizing we have a duty to our community and ecology to use our "gifts" in support of the whole (Bell, 2013, p. 103). The Anishinaabe tradition breaks this down into the four directions (Bell, 2013, p. 96):

1. East: Spirit Inter-connections – Respect – Vision ' see it'
2. South: Heart feel – Relationship – Time ' relate to it'
3. West: Mind think – Reciprocity – Reason 'figure it out'
4. North: Body acts – Responsibility – Movement 'do it'

Through embedding these concepts to the physical geography of the landscape, and in a circle like pattern (i.e. compass), displays how indigenous worldviews seamlessly connect their physical reality to their philosophical reality and create non-linear cyclical patterns to thought and self-development. In contrast the European worldview is much more linear and teleological. This linearity was greatly influenced by the Christian faith which believes all history is moving towards the end times when Jesus will come back in the rapture and restore the balance of good and evil. King (2003) expresses this throughout his first Chapter when he compares the Christian creation story and the indigenous one.

There has been a long standing tension between European and North American indigenous worldviews. Sadly the European worldview, from the renaissance to the modernist, believed itself to be superior and thus they imposed it upon indigenous peoples around the world through legislation, residential schools, inheritance rights and many other ways. My family history certainly falls into that category; however, we cannot

be held responsible for our ancestors faults. We did not decide for them or make them do anything. Our ancestors did that on their own. Yet we can Re-spect and look again at history and what happened; then build a Relationship with that past through connection and dialogue; after which we can think about avenues for Reciprocity; then take Responsibility by formulating a new worldview and taking action. In this way the four directions are universally applicable to all cultures and creeds. It represents a cultural way forwards where reconciliation is both possible and healing.

While the historical tensions between indigenous and European worldviews has been tumultuous, the future is continually getting brighter despite all the work still needing to be done. Within the field of education the incorporation of indigenous worldviews has never been greater in some regions. In British Columbia the First Nations Education Steering Committee (FNESC), in partnership with the British Columbia Ministry of Education, has pushed the incorporation of indigenous worldviews into mainstream education with the creation of English First Peoples 10-12 and BC First Nations Studies 12 in addition to mandating indigenous perspectives into most K-12 Science, Socials and Language Arts Prescribe Learning Outcomes (PLOs) (Curriculum; Resources; BC's Education Plan). There are also public school districts taking the lead as well. The Prince Rupert School District has a robust Sm'algyax language program from K-12 and now is mandating all K-4 students take Sm'algyax language classes (Daybreak). These are positive steps in a continuing battle which will take generations.

Another element helping to integrate indigenous perspectives into mainstream education is the proliferation of an ecological consciousness within the education system. Indigenous Environmental Education has seen a dramatic rise across the globe and North America (Lowan-Trudeau, 2013). This is not just isolated to indigenous peoples but to "programs teaching indigenous knowledge and philosophies for the benefit of both indigenous and nonindigenous students" (Lowan-Trudeau 2013, p. 404). Such incorporation will aid in legitimization of indigenous ways of being in a culture which has, at best, seen them as interesting windows into a more primitive time of humanity (Simpson 2002, p.18).

Quite possible the most important part of incorporating indigenous perspectives in the aid of environmental education is encouraging more intergenerational and pantheistic cultural systems (Bowers, 2013). This would allow "opportunities for students to ask questions about the differences between their own traditions and relying upon western ways of thinking and uses of technologies … [including] discussions of the too often unspoken and unexamined western patterns of thinking—including the deep cultural assumptions and forms of linguistic colonization that most western educators continue to take for granted" (Bowers, 2013, p. 229). One aspect of indigenous perspectives which is at significant odds with our current corporate-capitalist culture is the idea of a cultural and environmental commons (Bowers, 2013; Martusewicz, 2013). While the cultural megalith of Hollywood has the veneer of an accessible cultural commons it is in fact a cultural colonization tool for corporate-capitalism. Firstly it is based on the commodification of a social product which is exploitive rather than co-generative; in contrast, an indigenous cultural commons is a localized and generative dialogic response to the realities of existing in a particular {time} [place] and (space)[1] (Martusewicz, 2013, p. 259-260). In addition to the cultural commons Bowers (2013) talks about the idea of an environmental commons. This is something which is particularly demonized by corporate-capitalists as an antiquated perspective that needs to be eradicated for the benefit of indigenous peoples (Flanagan, Alcantara, & Le Dressay, 2010). However, from an ecological point of view seeing the environment as a collective owned and protected by everyone shifts responsibility from private, primarily corporate, owners to the local community, city, province, country, planet (Bowers, 2013, p. 229-233). If we all see ourselves as participants and owners then we all have a collective agency and interest in what happens. This perspective drives us into praxis rather than our current one which inhibits us into action through the belief that we have no interest or agency because someone else owns our land, culture, lives. This is one place where indigenous environmental education, which promotes the idea of a cultural and environmental commons, can benefit the education system despite its significant tensions with the current economic and cultural worldviews.

[1] I will talk about this at great length when I discuss the chronotope in subchapter 2.4.1.

Indigenous worldviews are an important part to this thesis as its focus and research is centred with the Gitga'at nation who are part of the Tsimshian people. While the Gitga'at have their own nuanced manifestations of what has been discussed here, the overall themes are present. This subchapter has been a brief overview of indigenous worldviews in general. The rest of the thesis will dive into the Gitga'at indigenous worldview in specific and as it pertains to [place]-based and technological learning environments. You will also see indigenous worldviews weaved throughout my discussions on [place]-based and technological learning environments. [Place]-based learning environments in particular owes much to indigenous perspectives. However, first I will discuss Learning Environments Research in general.

2.2. Introduction to Learning Environments Research

This study choose to focus through a lens of learning environments research for a variety of reasons. My perspective is that the study of learning environments gives decision makers and communities a deeper understanding from which to implement policy; moreover, learning environments research hones in on the actual [place] in which the education is happening which supports my worldview and perspective as articulated in Chapter 1. However, using this type of research to inform educational policy, especially at the provincial level, is far from the norm in Canada. While policy documents may refer to "learning environments" their use of the term is quite different than how I will be using it (Ministry, 2011; Ministry, 2010a; Ministry, 2010b; BC's Education Plan). This will become clear as my definition builds throughout this thesis.

Much of the political dialogue around educational policy today focuses on "evidence based" practices which are evaluated through national or state/provincial wide standardized tests (Tierney, 2013). The standardized test model is usually paired with talking points like choice, competition, deregulation, accountability, and data-based decision-making (Barkan, 2011). Yet this rhetoric seems eerily similar to running a competitive liberal "free"-market economy rather than a public social good like education. Moreover some have argued that the standardized test model promotes a lopsided

perspective disassociated from the [place] in which the school is functioning like the Fraser Institute's annual "school rankings" (Compare; Ehrcke, 2011; Gutstein, 2012; Hyslop, 2012). Is it really a surprise to anyone that the schools with the most affluent students who have educated parents, significant resources and low class sizes, perform better on a rigid formulaic exam than students without those benefits? By focusing exclusively on a summative assessment approach (i.e. standardized tests) to inform educational policy, society misses a massive chunk of the educational evidence it proposes to value so much (Fraser, 1991, p. 3). Moreover, there are serious questions as to whether or not these standardized tests have created a educational system which prepares students for post-secondary or if they are even an accurate reflection of all student intelligence (Freeman, 2009; Jarre, 2008; Tambeau, 2011). Learning Environments Research runs contrary to the top down approach of standardized tests and analyzes learning from a bottom up approach.

The main focus and purpose of Learning Environments Research is to understand how the ecology of the classroom functions within the perspective of its participants, i.e. the students themselves. This type of research focuses on the psychosocial component of the learning in relationship to the academic goals, or learning outcomes, of the course. It seeks to gain a holistic understanding of the educational environment in contrast to the aforementioned model which focuses solely on the quantitative data of summative standardized tests. Contrarily, the vast majority of learning environments research frames the quantitative survey assessments within qualitative observational and interview data. Interestingly, learning environments research was inspired by the sociological and psychological analysis methodologies which studied "work climates" in business organizations during the 1950s (Fraser, 1991, p. 5-6).

Unlike provincial or federal standardized tests, the most inspirational aspect of learning environments research is its capacity to inform and develop a localized educational response to the goals of its community. Education does not happen in a silo detached from its surrounding physical, psychosocial, cultural and economic structures; in other words, learning does not happen without its surrounding environment. Contrary

to the standardized test model, these environments cannot be nationalized, or even provincialized, but must be seen in their local contexts, structures and needs. This is not to suggest that research into a learning environment in Montreal could not give some insight into an aspect of a certain learning environment in an isolated indigenous village off the north coast of British Columbia. Rather, learning environments research gives us a capacity to accept some generalizations about the learning environment while always pushing us to consider the nuances of our own local learning environment. In a time when educational models are in extreme flux and being pushed by radically different ideologies and power brokers from all sides, studies of Learning Environments Research can provide some real evidence based clarity to the ideological battles raging within education today.

This study focuses on a learning environments framework because it combines quantitative data with qualitative data in a mixed methods research model which is inductive. Thus your conclusions are based on a broad range of data and not just the singularity of tests which select certain intelligences over others. I am also drawn to learning environments research because it focuses on the local [place] and (space) in which the learning functions. Thus learning environments research is the perfect model to study the effectiveness of [place]-based and technological pedagogies.

2.3. Learning Environments Research History

Learning Environments Research spans back to the late 1960s with the research of Herbert Walberg and Gary Anderson and their development of the Learning Environment Inventory (LEI) (Fraser, 1998, p. 1; Tal, 2001, p. 28; Logan, Crump & Rennie, 2006, 68). They began to use mainly quantitative measurements of the socio-emotional climate in physics classrooms at Harvard (Walberg & Anderson, 1968). Their use of systematic surveying and statistical analysis was meant to allow them to "explore empirically" how the learning "climate" functioned (Walberg & Anderson, 1968, p. 414). During this time period Rudolf Moos also developed an influential tool called the Classroom Environment Scale (CES) (Trickett & Moos, 1973; Fraser, 1998, p. 1; Logan

et al., 2006, 68). It was pioneering research like this that laid the bedrock for the expansion of Learning Environments Research.

Some of the early guiding philosophy can be seen in Moos and Trickett's article *Social Environments of Junior High and High School Classrooms* (1973). They broke down their work into a "social system perspective" which was characterized by three variables:

1. Interpersonal Relationships
2. System Maintenance and System Change
3. Goal Orientation.

Interpersonal Relationships is characterized by social interactions between all members of the classroom. *System Maintenance and Change* considers the overall structural health of the classroom while giving special consideration to the dual role of teacher as both friend and authority. *Goal Orientation* considers how the class is structured academically, for example, teacher-centred vs. student-centred. These three variables were measured using a mixed-methods approach with observations, teacher interviews and the CES survey; however, despite a general mixed-methods approach the results and analysis relied most heavily on the CES survey while generally minimizing the importance of qualitative data. The qualitative data was used primarily as an adjunct to the quantitative data and was not directly discussed in the article. This most likely has to do with the more structuralist epistemology which can be seen in declarations like, "If one can assess empirically the environment of the classroom, one can study the effects on students of being in a particular classroom for a period of time" (Trickett & Moos, 1973, p. 100). The goal in early Learning Environments Research was to hopefully gain some level of objective insight about the learning environment[2]. It could also be argued that, due to the prominence of positivist based research at the time, some of this drive could have come from a desire to secure research funding.

[2] While a noble goal, the capacity to gain objective insight from quantitative research has been challenged by qualitative researchers; a topic I will discuss at more length in my Methodologies chapter.

Throughout the 70s and into the 80s the idea of studying the actual environment which surrounds learning, blossomed, not only in popularity but in legitimacy as well. A barrage of studies through the 70s revealed the power of Walberg and Anderson's LEI and its capacity to inform practice (Fisher & Fraser, 1981, p. 145-147). During this time others sought to streamline some of the LEI's more fatty bits and eventually Darrell Fisher and Barry Fraser published an article on the "Validity and Use of the My Class Inventory" or "MCI" (1981). Throughout the 80s and into the early 90s this research began to solidify the conviction that the way in which students' conceptualize their environments has a direct correlation, and probable causation, on learning outcomes and behaviours (Moos & Trickett, 1973, 93; Fraser & Teh, 1994, p. 192; Lorsbach & Jinks, 1999, p. 158; Howley, Kusimo & Parrott, 2001, p. 230-231); this allowed the field of Learning Environments Research to increase in recognition in the 90s and into the new millennium (Fraser, 1998a, p. 2; Fraser, 2007).

One of the bigger developments over the course of research in this area is the development and validation of diverse survey tools which can accurately assess more finely tuned details of the psychosocial environments which promote learning (Fraser, 1998a, p. 1; Fraser, 1998b; Zandvliet, 2004, p. 98). The roots of Learning Environments Research is in predominantly scientific fields and thus the early years, and decades, were dominated by quantitative research. This has changed significantly as the rise of more mixed-method research models in the 90s and later have added to the capacity of Learning Environments Research to more accurately assess the psychosocial environment of the classroom (Fraser, 1998a, p. 4; Fraser, 1991, p. 19-20; Fraser & Tobin, 1991). However, this mixed methods approach to research has come under attack as a futile attempt to quantize what is essentially qualitative. From a positivist point of view the survey data is essentially an average of qualitative responses and thus does not meet the requirement of epistemological objectivism; from a constructivists point of view, survey data disregards deeper experiences of participants by generalizing the phenomenological (Ramaekers, 2013; Alexander, 2013). Yet a mixed methods theorist argues that it is exactly this vitriolic dualism which is at issue; rather, we should view each set of knowledge both distinct but having the capacity to give deeper understanding to the other (Alexander, 2013). In other words both qualitative and

quantitative knowledge work in a dialectical meaning making process. This is the viewpoint which I take in this thesis.

It is the research insights of studies like Barry Fraser's which settled me on this research model over others. In addition, it is the diversity of data and consideration which feeds into this insight. Other models in my opinion lack in this distinction. When your goal is to have a deep broad based understanding of the psychosocial learning environment, a mixed methods inductive learning environments research model is your best tool. It does not presuppose an outcome due to its inductive nature and utilizes triangulation of multiple data sources to support its conclusions. Research biases, while mitigated through the use of triangulation and other methods, are fully admitted; studies which claim an *a priori* knowledge cannot admit to research bias regardless of its inevitable presence. Finally, within the context of this study and its low participant numbers, I needed multiple data sources beyond just a statistical survey; additionally, surveys and test scores cannot completely capture the nuances of *Gitga'at* culture and perspective and thus incorporating multiple knowledge sources to inform conclusions was the best option for this study.

2.4. [Place]-Based, Cross-curricular and Indigenous Pedagogical Theory

Specific details about my implementation of the learning environments model will be discussed at length in Chapter 3 on Methodology. While discussing the research model is important, it is also imperative to discuss what exactly this thesis is studying and the theories and ideas behind it. This thesis will be considering two learning environments individually and how they interact. However, it is the [place]-based learning environment which takes precedent and provides the frame work for the second technological learning environment. Thus, for the purposes of this study, thinking will be framed through the lens of a [place]-based pedagogy.

2.4.1. [Place]-Based Pedagogy

In particular the curriculum structure which this thesis studies is based on a [place]-based framework with two underlying supports: cross-curricular and indigenous pedagogies. While these three pedagogies have primarily been seen as distinct, I argue that educators need to begin developing these three pedagogies into their own dialogic ecology. Through the development of educational models that resist compartmentalization, focus on locality and [place], and a realization of the indigenous philosophies of Respect, Responsibility, Relationship and Reciprocity (Cajete, 1994, p. 29, 173-175; Bell, 2013) our collective societies will create resilient communities which are critically structured and deeply democratic. This is the neo-social-matter we must create to counter-act the anti-social-matter of today's edification of hedonistic consumerism and mindless cultural compliance to a spoon fed metanarrative which is supported by a corporate capitalist cultural ethos. Yet to attain this deconstruction of western society's current metanarrative, it is best to begin with definition. This gives language the structure to become potent tools of transformation.

The concept of [place]-based education has gone through, and is going through, its academic debate within regards to definition. The idea of a [place] centric education can be traced back the Romantic Era and the ideas laid down by Jean-Jacques Rousseau in 1762 with his work "Emile: or On Education" (1979). He brought forth ideas of the natural environment being the teacher and our sensory perceptions being our tools (Rousseau, 1979, p. 38-39, 269-271). One could see this as the articulate first rumblings of phenomenological experiential education during the genesis of the industrial educational model. Dewey continued Rousseau's call during the industrial revolution in education and argued that place and community are integral parts of education (Gruenewald, 2008, p. 1; Schlottmann, 2005, p. 258). Moreover, Dewey characterized the process of experience outside the school, and in a [place], as a significant educative act (Woodhouse & Knapp, 2000). An article in the Harvard Educational Review in 1967 gave definition to a concept of [place]-based education as being "education in community" (Knapp, 2008, p. 6). Yet the real dialogue on [place]-based education started gaining steam in the '90s and has been heating up in the new

millennium with its tacit criticism of outdoor and environment education and its chameleon naming structure from community-orientated schooling to ecological education to bioregional education (Woodhouse & Knapp, 2000). Some might also argue that this chameleon naming structure could be tied to academic politics within regards to funding sources for research or being published in particular journals.

[Place]-based education at times gets lumped in with the concept of environmental education. While there is some truth to this, it is still problematic to conjoin the two terms. Schlottmann writes, “Rather than treating environmental education as a subset of science education, as is sometimes the case, the place-based education literature ties it into discourses concerning place” (2008, p. 257). This sentence is cryptic as to whether environmental education is a subset of [place]-based education or if environmental education is its own distinct entity; but it does relate it to something more than science and a “discourse” with place. A defining thread within regards to [place]-based education, which could shed some light onto this cryptic relationship, is Sobel’s (2004) definition of [place]-based education. A definition discussed in multiple texts on the subject:

The process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science, and other subjects across the curriculum. Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students’ appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens. Community vitality and environmental quality are improved through the active engagement of local citizens, community organizations, and environmental resources in the life of the school (Sobel, 2004, p. 7).

[Place]-based education, using Sobel’s definition, moves away from the pigeon holing of environmental education by having [place]-based education use “subjects across the curriculum”; thus [place]-based education is naturally cross-curricular which is important to this study. The concept of environmental education comes with the baggage

of studying the “science” of the “environment” or how the environment is in a “discourse” with “place”. [Place]-based education becomes an umbrella under which environmental education can function with this specificity.

It should be noted that defining, or pigeon holing, environmental education as primarily focused on science based models is disingenuous to early pioneers of environmental education. While it is argued that the term environmental education in the modern sense is closely tied to the term environmental science, this was not always the case. Early definitions characterized environmental education as cross curricular and broad in its focus. For example Sir Patrick Geddes viewed environmental education as “education of the whole person” (Palmer, 1998, p. 4); moreover, in 1970 the International Union for the Conservation of Nature and Natural Resources created what could be considered the classical definition of environmental education:

> Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality (IUCN, 1970, p. 11).

This developed into a broad statement of aims that included science elements in conjunction with social organization, people, economics, aesthetics, ethics, literacy and numeracy (Palmer, 1998, p. 13). In many ways we can see many of the defining elements of [place]-based education within the early definitions of environmental education.

Yet within the new millennium, due to educational and political responses to anthropocentric climate change and global warming, the term environmental education has been more closely aligned with the science of anthropocentric influences of climate change; additionally, in my experience, modern environmental education tends to diminish levels of economic and cultural criticisms in order to not offend particular groups of people. Thus educators tend to focus on the three Rs, “Reduce, Reuse, Recycle” rather than considering the inherent antagonisms between an economic system of endless growth on a finite planet or a cultural system of commodity fetishism. This is not

to suggest there are not personal criticisms of this within the rank and file proponents of environmental education; rather, these educators are nervous about certain institutionalized political imperatives of our society. One needs to look no further than the passionate opposition to the LEAP Manifesto within the NDP or claims that public schools are "brainwashing" students (Larsen, 2016; Stadel, 2016; Reynolds, 2012). In my opinion environmental education has responded to this by focusing in on the science of anthropocentric influences on environments and leaving the murky waters of social, economic and cultural considerations to the broader debate happening within society.

This is not necessarily a bad shift for environmental education. This shift allows environmental education to focus in on a particular niche without political fallout; moreover, [place]-based education can move in with a larger framework and build on the broader social, cultural and economic work of the early pioneers of environmental education. While the environment is a significant consideration of [place]-based education, it flows on par with cultural, social and economic considerations within its particular [place] both locally and globally.

David Gruenewald and Gregory Smith (2008) articulate the concept of [place]-based education as an educational movement with its contemporary roots in "new localism". With the onset of corporate capitalism and its push towards globalization, people have been thrust towards cultural homogenization, rootlessness and a profound sense of alienation from their physical everyday location. New localism is meant to provide a focal point for resistance against corporatism and its globalism and homogenization (Gruenewald & Smith, 2008, p. xiii-xvi). Gruenewald and Smith go on to write that [place]-based education is a manifestation of "diverse acts of resistance against the ravages of globalization and rootlessness" (2008, p. xvi). They continue to define [place]-based education as follows:

> …place-based education can be understood as a community-based effort to reconnect the process of education, enculturation, and human development to the well-being of community life. Place-based or place-conscious education introduces children and youth to the skills and dispositions needed to regenerate and sustain communities. It achieves this end by drawing on local phenomena as the source of at least a share

> of the children's learning experience… (Gruenewald & Smith, 2008, p. xvi).

The final result of this type of education is students who understand the "natural and social systems essential to human welfare" (Gruenewald & Smith, 2008, p. xvi). One of the main divergent points from Sobel is that Gruenewald and Smith are arguing from a point of radical social transformation. The destruction and reconstruction of society's metanarratives on a hyper-local level. [Place]-based education is put in the context of a resistance model to the contemporary dominant social system of corporate capitalism, consumerism and its neo-colonialism. It takes on the tone of Paulo Freire and his social constructivist approach along with Nietzschean ideas of meta-narrative disruption. Teachers are proposed to be agents in transformational social change by awaking the masses to their ecological position through a knowledge-self-construction paradigm.

Michiel van Eijck and Wolff-Michael Roth present a compelling "re-theorizing" of place based education (2010). In their article "Towards a Chronotopic Theory of 'Place' in Place-Based Education", Eijck and Roth invoke a literary critical theorist Bakhtin and his idea of the chronotope (2010). Bakhtin theorized that each type of literature is based on a chronotope: the dialectic between the culture, time, language and material environment when it was produced (2004, p. 84-85). Bakhtin develops an interesting nuance to this idea which amounts to a non-static evolving chronotope. He argues that over time the traditions and culture which created the literature fade. Eventually the persistent traditions which created the literature have "lost any meaning that was productive in actuality or adequate to later historical situations" (Bakhtin, 2004, p. 85). However, we still read and love these stories because the artistic meanings are "not subject to temporal and spatial determinations" and we thus "incorporate them not online into the sphere of spatial and temporal existence but also into a semantic sphere" (Bakhtin, 2004, p. 257). In other words, the chronotope of the novel fuses with the chronotope of the reader in a dialectical meaning making process which is non-static. Bakhtin theorizes that literature is in a dialectic, a conversation, with its readers and their time, language and environment. Eijck and Roth (2010) took this concept of the dialogic chronotopes and applied it to [place]-based education. They theorize that most current concepts of [place]-based education focus heavily on a monologue which is based in the

western epistemological constructs of either science or sociology in which meaning is forced upon the [place] rather than co-generated like Bakhtin's chronotope; moreover, these epistemological constructs (science, sociology, nature, building, bear, orca…) are mutually exclusive with no dialogue. In other words, in contemporary [place]-based theory, the chronotope of the orca in no way factors into that of the seal or hum-n. In contrast, through viewing [place]-based education as a chronotope, we see it as a dialectic which is open ended and incorporates infinite epistemologies, i.e. the orca, seal, hum-n, water, tree… (Eijck & Roth, 2010). In other words the chronotope of the individual is in dialogue with the chronotopes of the environment which surrounds it and thus a unique meaning making process is continually generating. For example, epistemologies of indigenous peoples, western society, the bear, the wolf, the tree, etc. All of these epistemologies, or chronotopes, are [place]-based, non-transferable, and non-static. The chronotope of the black bear in *Gitga'at* territory in BC's Great Bear Rainforest is in continual transformation with its surroundings and cannot be implanted into the epistemology of the black bear in the mountains along the north shore of Vancouver. Moreover, not only does place teach us but we teach place. An unending dialogic conversation of chronotope intermingling. This epistemological theory is one of the core ideas this thesis will take for [place]-based pedagogical theory.

In addition to considering theoretical musings on the definition of [place]-based education we can consider educational models which utilize a [place]-based pedagogy. David Zandvliet and David Brown, in their article "Framing Experience on Haida Gwaii: An Ecological Model for Environmental Education" (2006), discuss the process of immersing education into its [place] and (space). The article focuses on a summer school they did with teachers on Haida Gwaii. The philosophical basis for this project is the holistic element of "place based" (Zandvliet & Brown, 2006). The [place] and (space) is the educator and the teacher is the facilitator. The teacher surrounds the [place] and (space) with its cultural/spiritual essence so that it becomes immersive. Rather than tailor the culture to the curriculum you tailor the curriculum to the culture. Zandvliet and Brown also resist the drive to pigeon hole environmental education into the realm of science only. Environmental education needs to be holistic education where the compartmentalization of curriculum elements interweave into a epistemological, or

chronoptic, dialogue. The end result is curriculum which is locally divergent but globally relevant. Every town or "islands of discourse" develops a unique curriculum structure suited to its ecology and chronotope.

At its core, [place]-based education needs to be divergently non-static and resist attempts at stable definition. Its manifestations should be locally driven by the [place]/(space)/chronotope in which the education emerges. That said, definitions of [place]-based education need to be non-anthropocentric and utilize the [place] and (space) as an ever evolving oral text (Gruenewald, 2008, p. 143-146). [Place]-based education needs to facilitate a dialectical relationship with the more-than-hum-n-world and the multiplicities of epistemologies the eco[logical] world creates (Eijck, 2010; Pyle, 2008, p. 156-158; Zandvliet, 2006). [Place]-based education needs to be radically resistant to the contemporary cultural metanarratives given to us by Hollywood and Wall Street. Rather it should promote an organic critical literacy; by extension, [place]-based education is socially transformative with its transformative elements springing forth from the very ecology in which it is immersed. Thus, [place]-based education fosters the capacity for an infinite diversity of cultural emergence and alternative methods for living in communion with ecology. None of these are attempts at definition. Rather, they are a framework from which definition can manifest on an anarchistic level. [Place]-based education should create a chronoptic dialectical social-anarchy.

During this study students were continually asked to contemplate their response to the [place] and (space) in which they are immersed. They did this through journal posts on *Mahara*[3], art projects, oral discussion, videography, photography and scientific experiments. In addition students were prompted to consider the reality and perspective of other beings within their [place] and (space) and how they affected each other. There was no “right” or “wrong” answer in this but rather a continual critical construction of [place] through the phenomenological self. This was enhanced through an inter-curricular dialogue.

[3] Mahara is a web based electronic portfolio which will be discussed in detail section 2.8 and 3.13

2.4.2. Cross Curricular Pedagogy

In addition to [place]-based education, my pedagogy utilizes the concept of a cross-curricularity. The task of defining this is not nearly as daunting as [place]-based education. Simply put, cross-curricular teaching utilizes an over-arching theme which spans multiple subjects (Savage, 2012, p. 79). A unit design must be centred around a big idea which creates an interconnected dialogue between traditionally divergent subjects like English and Science. Currently, cross-curricular models are becoming in vogue in the UK (Alexander, Jarman, McClune, & Walsh, 2008; Savage, 2012) despite finding levels of criticism (Reid and Scott, 2005). Also, in British Columbia, there has been a movement towards centring the curriculum around big ideas and less on specific content as illustrated by BC's "New Curriculum" (Transforming). This could be seen as a positive step towards cross-curricularity; however much more needs to be done.

Traditionally, cross-curricular development has been mostly explored in "primary classes where one teacher teaches a number of subjects" (Alexander, Jarman, McClune, & Walsh, 2008, p. 24). A hindrance to cross-curricular development in the context of Secondary Schools is an issue. This resistance has multiple sources but could be broken down into two defining factors: institutional rigidity and fearful teachers (Savage, 2012, p. 80). Coupled with this is the overarching theme of standardization which constrains topical possibilities (Alexander, Jarman, McClune, & Walsh, 2008; Savage, 2012). Despite this, cross-curricular unit development and [place]-based education seem to be naturally interlinked.

There have been cross-curricular manifestations in [place]-based education (Eijck & Roth, 2010; Sorensen, 2008, p. 51; Zandvliet, 2006). Yet within the strict dialogue around [place]-based education, there is no collective mandate to incorporate cross-curricular elements. This seems logical in that, such a collective call to this mandate, would limit the incorporation of [place]-based education into many school structures. It is best that cross-curricular development, while encouraged, stay outside the scope of [place]-based education in specific. At the same time, cross-curricular courses increase student's conceptual knowledge about a given topic, heighten levels of student engagement, foster collegiality amongst teachers and develop a broader sense

of community (Alexander, Jarman, McClune, & Walsh, 2008). Moreover, an integration with a [place]-based model seems to naturally progress towards a symbiotic union. Thus the cross-curricular component gives a framework through which multiple educational models function in a dialectic symbiosis or, if you will, an ecology within the [place]-based pedagogy.

The learning environment curriculum in this study took a cross curricular approach to course development. Thus the students participation in the *Lu Lax Kyook* Ecological Monitoring Project (LEMP) immersed them in a blended curriculum where the language arts, science, socials, math and visual art blended into a unified whole. As a continuation and enhancement of [place]-based pedagogy and cross-curricular pedagogy comes the integration of indigenous pedagogy.

2.4.3. Indigenous Pedagogies

A model of education which reflects most of the elements of an [place]-based education is seen also within many indigenous educational frameworks. Indigenous educational concepts bring western society back into their distant educational roots. This type of framework is naturally [place]-based and cross curricular (Cajete, 1998, p. 27-28). Despite this inherent similarity, the indigenous philosophies around education have much to offer the pedagogy of [place]-based in particular with the explicit idea of spirituality.

The concept of spirituality is strong in models of indigenous education. Cajete talks about spirituality being “Nature centred” and defines it as evolving “from exploring and coming to know and experience the nature of the living energy moving in each of us, through us and around us” (Cajete, 1998, p. 22, 42). Yet spirituality is absolutely vacant, shunned, or euphemised in contemporary western education. While there are “religious” schools in the western tradition, this is different than having “spiritual” schools. Religion focuses on indoctrination of dogma and articles of faith which naturally work against logic and thus require faith. I grew up in this setting and attended the Mennonite Educational Institute in Abbotsford, BC; Capernwray Bible School in Sweden; and Trinity

Western University in Langley, BC. In contrast, indigenous concepts of spirituality centre around "Nature [which] is the true ground of spiritual reality. The natural forms and forces are expressions of spirit whose qualities interpenetrate the life and process of human spirituality" (Cajete, 1994, p. 44). Ross writes, within regards to indigenous spirituality:

> "We must be very careful when we consider the role of the spiritual plane. We are not dealing with some quaint custom, nor are we dealing with religion as many of us define that term in our post-industrial, western world. To many Native people, the spiritual plane is not simply a sphere of activity or belief which is separable from the pragmatics of everyday life; instead, it seems to be a context from within which most aspects of life are seen, defined and given significance" (1992, 54–55).

In both of these definitions, spirituality has to do with an embedded connection to [place] or nature. It is about breaking down the boundaries of Nature as being "other" and realizing that Nature is us and we are Nature. There is no dogma, book, belief/faith or hierarchy to this spiritual structure. It is free to own and explore in dissimilar ways creating an infinite amount of possible spiritualties.

The integration of spirituality is essential to developing an [place]-based education. The process of creating spiritual beings is also the process of fostering indigenous concepts of Relationship, Respect, Responsibility and Reciprocity (Bell, 2013, Evering & Longboat, 2013). First an individual must become spiritual in order to nurture a connection to the Other/Nature/[Place]. Once an individual has a connection they have the capacity to develop Relationships. In this way, students create a dialogue with Other/Nature/[Place] (Bell, 2013; McGregor, 2013). It is through this dialogue that Respect is created within regards to Other/Nature/[Place]. Once you begin to build a relationship, a natural level of respect is created. When respect is created the natural development is feelings of Responsibility. A student begins to have a responsibility to Other/Nature/[Place]. Finally, the task of Reciprocity is generated. Students will realize, through building relationship, fostering respect, feeling responsible, that they live in a mutually beneficial ecology with Other/Nature/[Place] and thus need to give back to gain.

All of this starts at the point of the spiritual which requires the development of introspection and empathy.

This was an important component of the [place]-based pedagogy and curriculum implemented in this study. However, the ideas of Relationship, Respect, Responsibility and Reciprocity are already a strong part of the *Gitga'at* social fabric. So this study worked more at fostering and nurturing the spiritual which was already there.

2.5. [Place]-Based Learning Environments, Constructivism, Phenomenology and Critical Pedagogy

In the previous section I adopted and co-constructed the concept of the chronotope and connected it to the epistemology of [place]-based learning environments. I will now further this discussion through an analysis of epistemological philosophies which provide the foundation for many [place]-based pedagogies. All of these ideas will further the concept of the chronotope within [place]-based epistemology and work towards defining the theory behind the epistemological learning environment created in this study.

First I want to briefly touch on the concept of wisdom which is generally vacant from the educational dialogue except in primarily indigenous writings. The world can be broken up into what could be called *technical memorization*, that being data and information which can be passed through rote methods, or *practical knowledge* which is passed through cultural tradition, apprenticeship and imitation (Alexander, 2013). Both of these work together in order to create understanding, or what has been characterized as "deep" knowledge/understanding as opposed to surface knowledge/understanding. For example, constructivists argue that since the learner actually creates the knowledge within themselves, this learner has a deeper understanding in contrast to the surface knowledge of didactic banking. This in general is where the educational conversation ends in traditional western thought; the end result being the internalization of knowledge/understanding within the learner. However, [place]-based pedagogics which incorporate indigenous models need to expand the educational end towards what Cajete

defines as the “fifth dimension” of knowing (1998, p. 48). For this dimension to be realized one must first come to wisdom which is “beyond knowing just through the physical senses” but rather “a complex state of knowing founded on accumulated experience”; the fifth and final dimension of knowing arises through “knowing the spirit directly” within a “multisensory consciousness” (Cajete, 1998, p.48). This final dimension comes from years and decades of wisdom development. From a western point of view this could be seen as ascending into a purely phenomenological experience with reality. Some might argue that this is a useless endeavour with the minds of our youth being too muddled with the bombasity of corporate capitalism’s individualism and commodity fetishization. This criticism misses the point that the goal is the implementation of cultural transformation. Thus [place]-based pedagogy should set our end educational goal as the fifth dimension even if it could never happen in a K-12 setting. I take this fifth dimension to be our cultural ideal from which all else should follow.

While the fifth dimension of knowledge is an important part of my pedagogy, most implementations of [place]-based learning incorporates a western epistemological theory based on constructivism. Constructivist pedagogy focuses on “the processes of meaning-making itself, rather than to the outcome of such a process” (Derry, 2013, p. 45). This concept within education can be found within the ideas of Vygotsky and Piaget. In particular Piaget’s idea of genetic epistemology, which focuses on the genesis of knowledge, and Vygotsky’s emphasis on sociogenetic knowledge development, which focuses on how knowledge is created within community and then individualized (Derry, 2013, p. 68-69). [Place]-based learning environments spring forth from a desire to design a learning environment in which knowledge emerges within the individual and group through interaction with the [place] and surrounding chronotopes. In other words, if knowledge and understanding is a process of individual and group construction, rather than a method of didactic banking, then the teacher/facilitator must design a (space) within a [place] for knowledge to emerge or spring forth. In this study the [place] was the *Gitga’at* territory and the (spaces) were the particular points at which educative environments arose. So for example, an elders house, during a big low tide in Mossy Bay, within the four walled classroom, etc.

[Place]-based pedagogies are generally mostly enamoured with Vygotskian theory over that of Piaget. Vygotsky morphed Piaget's constructivist epistemology into a social-constructivist one. Piaget adopted a much more Kantian view of knowledge and took specific pains to dissociate knowledge construction from the social (Derry, 2013, p. 71-73). Vygotsky rejected what Piaget called "spontaneous" concepts, which was a purely individual process, and developed the terminology "everyday" as a way to highlight how concepts develop through a social process even if they are not through specific instruction. [Place]-based pedagogies generally view the teacher as a facilitator who develops a social (space) in which knowledge is co-constructed among the participants. This is a Vygotskian social-constructivist process. Thus, during my courses students both interacted socially with each other and their environment, intermingling their chronotopes if you will, and then would reflect on that in an individualized setting. In this way knowledge was constructed; or for this study's purpose, chronotopes were continually reconstructed. Put another way, learning in this study is meaning driven, identity forming and socially situated (Brown and Duguid, 2000).

Vygotsky also inverted Paiget's idea that development precedes learning by constructing the idea of *Zones of Proximal Development* or also called *ZPD* (Lake, 2012, p. 40-42). Paiget felt that a student would have to attain a certain level of development before learning could take place; in other words, development initiated the learning process. In contrast, Vygotsky felt that learning initiated development; thus learning should focus on ZPD. The ZPD is an abstract optimal space within a student's learning where development can take place through learning. The idea of "scaffolding" is a metaphor in which ZPD is progressively created in order to guide learning to a specific developmental point (Lake, 2012, p. 53-55). ZPD is the space between what a student knows and has mastered and what a student cannot know or master until s/he has developed through the ZPD via the learning process. A [place]-based learning environment is in itself a *zone of proximal development environment* which is created and developed by the teacher/facilitator. During my curriculum implementation I continually assess where my students are at and how to create a new learning (space) that can initiate development.

The influence of constructivist pedagogy on [place]-based learning environments would not be complete without some discussion of Dewey's concept of experience and education. Dewey argued that education happens through the process of experience and an educator's main task is to "arrange" experiences which are "enjoyable" and "promote having desirable future experiences" (Dewey, 1997, p. 27); although this has been challenged in recent years with cognitive dissonance theory being applied in educational settings (McFalls & Cobb-Roberts, 2001; Peters & Filipova, 2009). Despite some interesting potential in cognitive dissonance, Dewey's concept of the "enjoyable" experience is still the primary goal of all districts I have worked in. Additionally, his idea of the *Principal of Continuity of Experience* reflects a scaffolding in that learning comes from experiences which continually build upon previous experiences and this constitutes "growth" (Dewey, 1997, p. 35-36). Further, Vygotsky's ZPD is mirrored in Dewey in that an educator "must survey the capacities and needs of the particular set of individuals" in order to design experiences which are educative (Dewey, 1997, p. 58). In other words, a teacher must find the ZPD of their students and structure experiences that reside in that zone. Furthermore, Dewey, throughout his book *Experience & Education* (1938), emphasizes the social component of the learning process and thus promotes a social constructivist pedagogy. The idea of experience, or experiential education, has been a significant pedagogical influence on [place]-based learning environments and Dewey cannot be underestimated in his influence on [place]-based pedagogy. Most examples of [place]-based education have a strong experiential component.

The idea of experience as an entry point to knowledge formation ties in with phenomenological epistemology. While constructivism considers epistemology in a macro sense, phenomenology hones in on the very moment personal of knowledge acquisition. Put another way, constructivism considers how learning emerges from a series of phenomenological experiences, or to use Husserl's term, from eidetic seeing (1982, p. 8). In order to gain knowledge one must seek the "primal experience" which amounts to "sensuous perception" (Husserl, 1982, p. 82). Husserl writes, "The Eidos, the *pure essence*, can be exemplified for intuition in experiential data" (1982, p. 11). Husserl borrows the term "Eidos" from Plato's infamous concept of the forms but instead of, as Plato did, putting the Edios in some abstract perfect heaven, Husserl embeds the Edios

into the very thing itself which he generally calls the “essence” (1982, p. 7, 40-42). Thus, from a phenomenological perspective one can actually know the thing in itself beyond the subjective *a posteriori*. This is done through eidetic seeing which attempts focus on pure phenomena while setting aside preconceptions. In Kantian language, a phenomenologist views eidetic seeing as an *a priori* act. Thus one begins connecting to the “intuition in experiential data”. Maurice Merleau-Ponty sees this process as a “creative operation which itself participates in the facticity of that experience” (2002, p. 96). Knowledge creation comes through a dialectic phenomena between the perceived and perceiver. Heidegger defines the phenomenological process in a “pre-ontological” sense with his idea of Da-sein; he writes that “it is ontically distinguished by the fact that in its being this being is concerned about its very being” (1996, p. 10). Da-sein is a being through which one experiences the very core nature of the world through the state of “being-in-the-world”; it is a dialectical immersiveness between the “world” being and “soul” being which causes both to blend into <being> (Heidegger, 1996, p. 55). This Da-sein blending and eidetic seeing could be compared to the Buddhist idea of mindfulness. The process of mindfulness is to insert your being into “between thoughts” which are “non-discursive, free of representation and interpretation” (Bai, 2001, p. 18). Through this one can inhabit a “transfusional phenomenon” where the self-being transfuses with the other-being (Bai, 2004, p. 59). Thus the Da-sein experience emerges and the essence of a thing is known in an *a priori* sense. Within [place]-based pedagogy there is a strong desire to initiate phenomenological knowing which begins a deeper learning process. The blending of a constructivist and phenomenological epistemology starts with the phenomenological experience which initiates our construction of knowledge through the intertwining of a multitude of phenomenological experiences thereby continually reformulating a person’s chronotope. This study used the idea of mindfulness to promote a level of phenomenological experience within the students as it is less esoteric than the Da-sein or Eidos.

Phenomenology is important for [place]-based pedagogy because it forces learning to move beyond the traditional didactic methods by evacuating rote learning of any epistemological value. Learning now becomes the constructing of knowing through the critical analysis of sequential phenomena. In such an epistemology the process of

memorization and regurgitation becomes a mindless activity with no value. Thus, as [place]-based educators, we must foster the Da-sein awareness within our students so that they can develop eidetic seeing and construct their knowing within the chronotope. This creative process will manifest a diversity of knowledge which will plunge knowing into the anarchistic absurd. Yet it is precisely at those points when collective knowing is at its most anarchically absurd that revolutionary knowledge flowers and sends out the seeds of social change and (re)formation. In many ways this process is the essence of hum-n social evolution.

This idea of (re)formation is an important part of the decolonization process of indigenous peoples everywhere. Within my course, students were prompted to consider the inherent antagonisms between their traditional cultural way of being and the ways of being idealized to them through their primary source of cultural consumption: Hollywood and western metanarratives of consumption and individualism. As you will see in this study's data, students were in continual conflict between their Xbox or iPhone and their traditional or emergent ways of being. Yet within much of the literature around [place]-based pedagogy this is no longer isolated to indigenous communities trying to (re)establish their cultural essence after systematic destruction. This has become a systemic struggle for diversity and what Gruenewald calls "New Localism" amongst all cultures, creeds and communities.

The process of social change and hum-n (re)formation is an important feature of [place]-based pedagogy. This brings us to Paulo Freire and his critical pedagogy. As discussed previously in the first three sections of this chapter, it has been argued that [place]-based pedagogy is in conflict with the oppressive and colonizing force of global corporate capitalism[4], its rapacious desire to "expand markets" which in turn embeds an homogenous culture and economy, and the push towards corporate supranationalism.

[4] It should be noted that "corporate capitalism" does not suggest all capitalism but rather a perceived warped manifestation of capitalism by corporations and their embedded metanarratives. Moreover, corporate capitalism has a disproportionate ability to disseminated and inculcate its metanarrative through concentrated ownership of the media and avenues of cultural consumption. In Canada, PostMedia, albeit ailing at this point, is an example of this media concentration. This allows corporate to have dramatic influence on the collective discourse within society in addition to having close relationships with elected officials and legislative office. Collectively all of this, in the eyes of Freire and many [place]-based theorists, creates a colonizing effect on the population by the collective corporate structure.

From a [place]-based perspective we are all the oppressed subjects of a hijacked cultural, economic and democratic system; this idea can be seen in much of David Gruenewald and Chet Bowers writing on the subject of [place]-based education. In the words of Freire the [place]-based educationalist "considers the future [as] pre-established – a kind of inevitable fate, fortune, or destiny" (2009, p. 38). Thus the task of critical educators is to initiate a "critical consciousness", or "conscientização", to subvert this "destiny"; moreover, this is only a "task for radicles" (Freire, 2009, p. 35, 39). Yet being radical is always relative to the oppressive force. In other words, each individual is radicalized when juxtaposed from the other's position.

From a critical pedagogy perspective oppressor and the oppressed are locked into a toxic relationship where the oppressed have "internalized the image of the oppressor and adopted his guidelines [and] are fearful of freedom" (Freire, 2009, p. 47). Within the "middle class" the relationship is most toxic because the oppressor has manifested an "irresistible attraction" within the oppressed towards the oppressor (Freire, 2009, p. 62). This amounts to an embedded colonization of the mind by the oppressor, in our case through Hollywood and the corporate media machine. The social-constructivist process of the corporate media machine was well documented by Edward S. Herman and Noam Chomsky in their seminal work *Manufacturing Consent* (1988). The cultural fabric of society is structured by the oppressors and it is the task of the [place]-based educator to structure phenomenological experiences which call into question the homogenizing global force of corporate capitalism and initiate the construction of a localized epistemology or chronotope. Fostering a generative local culture was a passion of Ernie Hill, former principal of Hartley Bay School and *Gitga'at* elder, and this study focused on a curriculum which intended to support that dream.

What is most interesting about Freire's pedagogy is the idea that both the oppressor and the oppressed are in chains and in a dehum-nizing situation and the processes of gaining freedom for both must be a mutual act (2009, p. 64-69). However, most people are in the fish bowl and cannot conceptualize their oppression. This is where a critical pedagogy comes in. Educators must foster conscientização within their students through "problem posing education" which initiates praxis by the students;

praxis is the “reflection and action upon the world in order to transform it” (Freire, 2009, p. 51, 67, 79). One way to initiate praxis is through the realization of a situation which is “limiting” (Freire, 2009, p. 85). For example, for [place]-based education the cultural monolith and dominance of Hollywood and mega media conglomerates limits the capacity for truly local culture to be created; this could be the focal point for a problem posing curriculum which would move the students into praxis. This is an issue which indigenous peoples are dealing with throughout the world and in the *Gitga’at* community where this study takes place. The loss of traditional languages, like Sm'algyax, is an issue where youthful praxis could take place and which is directly related to the homogenizing force of the British/American cultural machines. Despite a robust *Sm’algyax* language program within the Prince Rupert School District and Hartley Bay, there is no *Sm’algyax* sitcoms or dance songs or radio stations or other contemporary manifestations and thus the language is waning with only a handful of fluent speakers left. From a Freirian perspective the embeddedness of Anglo culture is a limiting situation for *Sm’algyax*. Within the context of this study a limiting factor which motivated the students to praxis was the Enbridge Pipeline and subsequent oil tankers out of Kitimat. In part the *Lu Lax Kyook* Ecological Monitoring project was their praxis response to that situation.

Another significant component to a critical pedagogy is that one needs to create a dialogic education. This dialogue should not so much be directed at a person but rather at “thought-language” itself (Freire, 2009, p. 97). The oppressor utilizes language as a colonizing tool and seeks to control the reality of the oppressed through their thought-language (Freire, 2009, p. 90). As with corporate capitalism, this is why the oppressor supports a “banking method” where information is “deposited” within the student so it can be withdrawn (i.e. standardized test model) at a time which is most suited to the oppressor (Freire, 2009, 71-74). This idea of shifting the very linguistic reality of society is picked up in other contemporary places like Chet Bowers’ ideas of the “root metaphors” of society (2001b). It also has become a continued theme in [place]-based education through the idea of developing a [place]-centric language.

In short a critical pedagogy is one that foster critical thinking within students and through that critical thinking moves the students to praxis. The shackles of oppression begin to fall away when you have the critical capacity to understand the limiting reality of your social situation and are then moved to action because of it. In a way "the only freedom that is of enduring importance is freedom of intelligence" (Dewey, 1997, p. 61). That is to say, first your mind must be free and then all else will follow.

Ultimately this should be the core consideration for [place]-based educators. How does one develop curriculum which wraps itself in the chronotope while initiating a series of phenomenological experiences which students construct into a personal critique of their social position and thus move into praxis? While this might seem like a daunting task, it is actually not that hard. For this study the curriculum was the *Lu lax kyook* Ecological Monitoring project. There are also many other examples of [place]-based curriculums accomplishing this.

2.6. Curricular Manifestations of [Place]-Based Learning Environments

The State of Maine has had some great success in implementing a [place]-based pedagogy into their educational system. Maine has seen a significant exodus of youth and students (Bartsch, 2010, p. 66-67). In order to combat this Main took the premise that this exodus was due to students feeling disconnected from their communities and the curriculum in the schools. They took on a [place]-based approach to curriculum development by actively engaging the students in "the challenges facing the future of their town" through implementing a "problem-based curricula" (Bartsch, 2010, p. 67 & 74). This initiated a praxis whereby the students were motivated by the limiting situation of the socio-economics of their community and were empowered to facilitate change within it. Rather than capitulating to the banking and testing method influenced by Wall Street and dictated by the US Presidency and Congress, Maine saw their youth as "source[s] of social capital" which was "an underutilized resource" (Bartsch, 2010, p. 68-69). Rather than giving the students textbooks to mentally bank historical knowledge they gave students phenomenological moments so that they could construct meaning

through the use of dialogue, art, writing and technological tools like iMovie and PowerPoint (Bartsch, 2010, p. 65-66 & 72). My thesis's methodology was in many ways modeled after Maine's in how it incorporated technology and [place]-centric curriculum through interaction with community members, institutions and [place]. In Maine students were given technological tools to research the history and society of their communities. Their research was used by Maine's Historical Society and other institutions (Bartsch, 2010, p. 70-75). Thus student's work became even more meaningful in that they participated in the cataloguing of history not just banking the knowledge out of a textbook to regurgitate on an exam; moreover, students became participants in the community though interviewing community members and researching both historical and contemporary issues effecting the community. The research in this thesis accomplished very similar outcomes by utilizing technological tools to record scientific observations and video/audio tools to record those observations along with traditional stories and elder knowledge.

Another source of inspiration for this study, and an exemplar of [place]-based pedagogy, is The Alaska Native Knowledge Network. In addition to having close cultural ties with the Alaskan native peoples of the Tlingit, the *Gitga'at* also have similar challenges both culturally and socially. There is a continual struggle that indigenous peoples are "living in two worlds" (Barnhard, 2010, p. 113). In addition the contemporary cultural, academic and economic structures tend to devalue their traditional knowledge, ideas and culture (Barnhard, 2010, p. 118). In order to combat this the Alaska Native Knowledge Network use a one week camp in Old Minto where the learning is "embedded in the environment"; this embedded learning is important when "a culture is deeply rooted in a particular place" (Barnhard, 2010, p. 116). These camps have morphed into curriculum resources which promote an "experiential, inquiry-based pedagogy" (Barnhard, 2010, p. 122). The premise is to immerse the students in their experience of their local place in order to gain knowledge through phenomenology and social constructivism. Yet this is more than just trying to abandon western or contemporary knowledge; rather the Alaska Native Knowledge Network blends the "Native Knowledge Stream" with the "Western Knowledge Stream" into a "systemic integration" (Barnhard, 2010, p. 121). The idea being that both knowledge systems have

their strengths and weaknesses. By combining the strengths of each a more rich and intimate knowledge can be constructed. This study's curriculum was designed in a similar way. Students used modern scientific and technological tools and combined those with traditional techniques and knowledge.

While both of the above mentioned projects were done on a much more massive scale in terms of time/longevity and number of students, this study represents a [place]-based pedagogical implementation which is small in scale but just as effective. The students and I utilized a problem based learning approach to initiate the educative process. We then combined traditional Gitaga'at ways of knowing with western ones. This was important because it allowed the students to conceptualize how they didn't need to "live in two different worlds" but could begin to construct their own realities based on their chronotopes. Rather than just attempting to perform their traditional culture and consume modern western culture, students can create their own local [place]-based culture rooted in their chronotopes. This is an important element in this study and the studies previously mentioned. That student's become invested and empowered. Then they begin take control over their [places] through a critical education.

2.7. Technological Learning Environments: [Place]-Based Philosophical Considerations

Attempting to integrate a technological learning environment with a [place]-based learning environment creates certain challenges. Some might even argue that these two learning environments are antagonistic. These challenges can only be addressed when we understand the imbedded root metaphors of technology. With every structure there are deep philosophical aspects to consider when implementing a [place]-based education. We have to ask: What are the historical, ideological, epistemological, ethical, aesthetic and metaphysical constructs, and embedded assumptions, within the structure of our pedagogical tools? (Zandvliet, 2006, p. 14; Bowers, 2001a; Bowers 2014). The development of technology within the latter half of the 20th century, and the philosophies and cultures which inspired it, should be considered when incorporating a technological learning environment into a [place]-based learning environment. How will these elements

promote or detract from a [place]-based learning environment? It is important to consider the root metaphors of pedagogical tools as they can have a significant impact educational outcomes (Bowers, 2014, p. 170); moreover, while tools may be something we "use", they are also cultural constructs which someone made intentional decisions about. That someone has embedded their cultural assumptions and ideas into the piece of technology through a "series of wilful acts" (Zandvliet, 2006, p. 15). These cultural assumptions present some very real challenges when constructing a indigenous [place]-based educational curriculum. Thus I feel it is important to deeply consider the root metaphors of technology, what their makers desire to progress, and how that fits within a [place]-based pedagogy.

2.7.1. Development and Corporatization of Computer Technology

Computers began in the militarized context of the US Army's ENIAC project in 1942; the world's first true computer which was solely design to compute ballistics information (Zandvliet, 2006, p. 16-18). Much of the same militarized structures characterize computer and technology use in our educational systems today. Everything is top heavy. The choices about which computers and technology to use and the capacity to access that technology. It is all controlled by the school district's Technology Department. Everyone is sectioned off into groups of access, permission and legitimacy: SuperAdmins, Admins, Teachers, Students, Guests, etc. The bottom generally never informs the top about structure and design and the top generally dictates this to the bottom. Everyone is on a need to know basis and knowledge is closely guarded. Furthermore, all actions are monitored from the central command of the Technology Department, which, arguably, furthers the legitimacy of a surveillance society through the normalization of ubiquitous surveillance. Thus, the overall structure and design of our technological learning environments emanates from a militarized root metaphor and design; moreover, all of this is mirrored by the corporatization of technology which functions like a militarized structure.

Root metaphors, like militarism, are an important consideration when building a [place]-based learning environment. In addition to militarism when we insert technology

into the classroom we inherently take on the root metaphors of the corporations, or industry, which created the technology (Bowers, 2014; Bowers, 2001a). One of the biggest root metaphors embedded within our technology is that of social Darwinism (Bowers, 2014, p. 170). Big tech sees its globalized knowledge and technology as superior to the "place-appropriate technologies" of indigenous cultures which, from their perspective, should fade away to their superior technology (Bowers, 2014, p. 172). Survival of the "fittest technology" one might say. Many see the metanarrative promoted by certain influential theorists in technology and "advancement" as the source of our current ecological, social and spiritual global crisis (Abram, 1997; Bowers, 1996; Bowers, 2014; Cajete, 1994; Wade, 2009; Gruenewald & Smith, 2008; Bai, 2001; Marx, 2005). This is an important consideration when deciding how to promote [place] when technologies we utilize work towards promoting their own interests and metanarratives over [place] appropriate ones. For example, an annoyance for me has always been Microsoft Word's spelling "dictionary" and students telling me a word does not exist because its not in the "dictionary". In this subtle way Microsoft has the capacity to structure language and thought. A [place]-based pedagogy must take Microsoft's god like status over what "is" a "word" head on.

In addition to the core philosophical underpinnings of the influential philosophers of technology, there is also the overt desire to promote homogeny and unfairly crush competition rather than promote diversity, or one could even say, capitalism[5]. An example of this compulsion to control the teleology of technology is through the equal compulsion of technology corporations to legitimize their monopolies. The big tech corporations viciously protect their gatekeeper status to technology and manage to sustain their monopolization over market share (Windows; McKenzie & Shughart, 1998; Keizer, 2013). Shockingly technological monopolies are now an accepted practice and have become normalized; yet there are some challenges outside America. Google, Apple and Amazon are now all fighting antitrust litigation in Europe (Chee).

[5] Since a fundamental premise of capitalism is the idea of competition and diverse markets.

The desire to monopolize and homogenize through their technological tools, and the root metaphors this creates, needs to be considered when creating place appropriate curriculum with technology. A particularly poignant example is “Google for Education” which is “a solution built for teachers and students” (Google for Education). This enticing front page depicts engaged students outdoors, on technology and a teacher whose been teaching for 65 years. Google is your best educational friend … except for the fact that they are collecting mountain loads of information in order to further their interest and monopoly (Peterson, 2015). The Electronics Frontiers Foundation has now filed complaint with the FTC in the US for Google’s “spying on students” (EFF, 2015). This philosophy of big data collection, surveillance, control and centralization is institutionalized within big tech and Google is by no means an isolated example. This presents significant challenges to implementing [place] appropriate technological education; moreover, it represents an unhealthy desire for social control by both corporations and government (Mantelero, 2014).

The normalization of ubiquitous surveillance is also an issue for [place]-based pedagogy. It could be argued that the US government, in their war on “terror”, see technological monopolies as a prime solution for an omnipresent surveillance state (Greenwald & MacAskill, 2013; Bowers, 2014; McCarthy, 2015). It is easier to monitor everyone if they are centralized rather than diversified. Thus technology itself has become this ever present eye which is watching you all the time. This is problematic for diversity or dissent which is a central theme in [place]-centric education. The capacity to discuss contrary opinions or ideas without fear of reprisal or “being watched”. So a [place]-based educator should consider how, or if, a piece of technology is promoting/legitimizing a surveillance state or a society which is detrimental to democratic discourse and localism. If so how should that be dealt with in the pedagogy?

These metanarratives and beliefs of computer/futurist thinkers is important and presents many challenges for integrating a technological learning environment into a [place]-based learning environment. Many of the corporations, programmers and developers who create the technology believe in the underlying ideologies of Futurism as laid out by people like Raymond Kurzweil, Bill Gates and Steve Jobs. The world of

futurism is marked by its cultural homogeny, unequivocal support for liberal market capitalism and globalization, and a disregard and pedantic attitude towards cultures which are not embedded with the root-metaphors of western capitalist culture (Bowers, 2014). Futurism's ideological mother is the much older corporatism and its infusion of "rhetoric, propaganda and dialectic", in other words, root metaphors, within the body politic of western society (Saul, 1995, p. 48, 40-75). When developing a [place]-based learning environment with substantive technological tools we must be cognizant of Futurism's influence on technology within the psychosocial environment of the classroom.

2.7.2. Hacker Philosophy, Theory and Response to the Corporatization of Technology

So for [place]-based educators, where is the rub in all of this? How is it even possible to integrate technology when their root metaphors tend to be so contrary to those of [place]-based pedagogy? The answer lies in (re)-constructing the root metaphors for our own [place]-based purposes and making technology "Open Source". When digital technology is broken down into its most base physical form it really amounts to nothing more than binary code and electrical impulses, not an *a priori* cultural metanarrative. This was picked up on in the electrical haze of an infant internet. In response to the dominance of government and corporate control and influence over computers and technology rose up a response best summed up in a 1986 Phrack BBS post by a hacker calling him/her/self "+++The Mentor+++" shortly after s/he was arrested:

> This is our world now... the world of the electron and the switch, the beauty of the baud. We make use of a service already existing without paying for what could be dirt-cheap if it wasn't run by profiteering gluttons, and you call us criminals. We explore... and you call us criminals. We seek after knowledge... and you call us criminals. We exist without skin color, without nationality, without religious bias... and you call us criminals. You build atomic bombs, you wage wars, you murder, cheat, and lie to us and try to make us believe it's for our own good, yet we're the criminals (+++The Mentor+++, 1986).

During the rise of sanctified Big Tech and their influence/control over patents and licensing, there also rose up a response, a parallel universe if you will. These people believed information should not be commodified but free and open so all can learn. Sometimes dubbed “Hacktivists”, their philosophy, expressed in various clubs and associations like 2600 Magazine, Phrack Magazine, Chaos Computer Club, Electronic Frontier Foundation, Vancouver Hack Space (VHS), DEF CON[6], etc. Their goal is to deconstruct the secure walls and towers of knowledge built up and patented by corporations and government institutions and disseminate that knowledge freely and openly; moreover, they also believe that in order to be truly free one must be able to express their thoughts without fear of reprisal.

The most interesting point for [place]-based educators is that technology at its core is just the binary code, “the electron and the switch”. In other words, technology is like gravity: acultural, abiological, apolitical and just about neutral in every sense. It only becomes cultural, or imbedded with root metaphor, at the point of manipulation. Thus, as the “+++The Mentor+++” articulates, we can take control over technology and use it to our own design and purpose. Integrating the technological learning environment into the [place]-based learning environment requires us to delegitimize the corporate authority over the technology and reinvigorate a decentralized (re)-control over technology. Hackers and their (re)-culturalization of technology, provide the philosophical building blocks for a technologic [place]-based education, in particular the philosophies and theories behind Open Source technology.

In the corporate technological model the “source code” of the program is kept secret and is patented; moreover this model’s main goal is to maximize profits and believes that progress is gained through the secrecy and competition of elite corporate institutions (Economides & Katsamakas, 2006). Open Source takes a radically different approach. All of the source code is non-proprietary, freely available and downloadable by anyone; people, communities or [places] can modify, tweak and twist open source technology with few if any restrictions. In fact open source developers get jazzed up

[6] I have provided citations for all of these and they will be my supporting evidence for the following knowledge.

when you do – unlike corporations who are likely to sue you. The open source model's main goal is the progression of knowledge, universal access and the belief that collaboration produces better results than competition (Open; What).

The idea of open source can be a powerful [place]-based tool which has the ability to influence the corporate masters of technology from the ground up and has done so with tech corporations like Microsoft, Apple and Google (Finley, 2013; Chacos, 2015; Finley, 2015). This incredible influence of the open source community reveals that [place]-based educators can use technology effectively to produce [place]-appropriate learning environments with technology. In addition, through the embedding of [place] within technology, [place]-based educators can have a very real influence on how society or corporate institutions functions.

Not surprisingly the open source philosophy has a popular support amongst educationalists and provides a framework for [place]-based technological development. The most popular open source software for education is Moodle. Initially released in 2002, Moodle is an open source Learning Management System which relatively easy to implement, scalable, and fully customizable (Moodle). However, there are many other examples of community driven, bottom up, educational technologies including the Ubuntu operating system and the web interface used in this thesis research, *Mahara*. The open source program of *Mahara* is discussed in detail in the sections 2.8 and 3.13. These technologies and the hacker metanarrative reveal that [place]-based pedagogics can use technology in a [place]-based way by (re)-forming and (re)-structuring their chronotopes to reflect the (space) and [place] of the learning environment.

2.8. Technological Learning Environments: From Research Towards an Integration Into [Place]-Based Learning Environments

While [place]-based educators might be resistant to technology, the importance of integrating technological learning environments into [place]-based pedagogies cannot be understated today and in the future. Technology is going to become an increasingly

imbedded part of the experience of [place]. The only question for [place]-based pedagogy is whether we should leave the root metaphor construction to the corporate gate keepers or decentralize it into [place]-appropriate constructions. This thesis takes the perspective that [place]-based educators should be on the forefront of technological integration and innovation. As such I want to take a look at some of the extensive research done into technological innovation and learning environments while considering its relevance to [place]-based pedagogies.

The process of technological innovation is a dynamic interweaving system of knowledge acquisition, public policy, economics, resource mobilizations and education (Bergek, Jacobsson, Carlsson, Lindmark, & Rickne, 2008). In 1965 the co-founder of Intel, Gordon Moore, predicted that by 1975 circuitry advancement would double every 2 years (2006). Eventually dubbed "Moore's Law" this prediction turned out to be remarkably accurate as semi-conductor advancement doubled about every 1.5 years for a period of 50 years (Koomy, Berard, Sanchez, & Wong 2011). While this trend with semi-conductors has slowed in recent years due physical limitations, technological advancement will undoubtedly still grow at an exponential rate with new advancements in mega-multi-core chips, nano-technology and quantum computing (Hardesty, 2015; Koomey, Naffziger, 2015; Wu, Shen, Reinhardt, Azu and Dong, 2011; Bennington, 2015). This rate of exponential growth in technology has forced itself on the educational and [place]-based learning environments and will continue to do so. Thus [place]-based educators should consider the history of education and technology in order to consider how to best utilize it effectively and in [place]-appropriate ways

Early interest in constructing technological learning environments began in the 70s and started picking up steam in the 80s. For computers most of the curriculum was predominantly within science and mathematics education and initial studies into these technological learning environments showed a fairly low effect size for "computer assisted instruction" (Fraser, Walberg, Welch, & Hattie, 1987, p. 157). This in part was blamed on the limits of computer technology at the time which created technological learning environments which were "drill-and-practice" or "page-turning" programs rather than more "psychologically sophisticated" (Fraser et al., 1987, p. 160). However, in the

early 80s there was a study which showed some high effect size with computer-assisted instruction in mathematics; yet contrastingly, studies during this same period also show very low effect when the computer environment was not supplemented with, and a part of, teacher/instructor interaction (Fraser et al., 1987, p. 202 & 204). Teachers at the time most likely did not use the technology effectively or efficiently due to a lack of both skill and established pedagogy (Fraser et al., 1987, p. 211). These points by Fraser et al. provide some interesting insight for [place]-based pedagogy and technology. It reveals that the technology itself is devoid of educational potency if dislocated from the curriculum (space) which surrounds it or if that curriculum (space) itself is dislocated from the [place] in which it is situated. Thus, technological uses like "drill and practice", which is devoid of any [place] or critical thought, has no educational value (Fraser et al., 1987); yet if the technology is more there as a support from a teacher/local led curriculum, then it can enhance learning.

The main innovation and leap in technological learning environments was not closed programs but rather open internet based programs. The first attempts at creating an online learning environment took place in the mid to late 90s. A study by Kenneth Tobin was one of the first of its kind (1998). This study took place in Florida and was geared towards working science teachers who wanted to upgrade to a Masters; moreover, Tobin initiated the concept of a "Connected Community of Learners" which is what he called the application they used to create an online distance based environment (p. 139). Tobin's study was revolutionary in that it was the first to effectively use a technological environment in a constructivist way, rather than a much more didactic way, by allowing students to work asynchronously (p. 146). Students would read required material and then discuss and co-create knowledge with the teacher. This eventually enhanced self-esteem, confidence and gave a sense of professional pride (Tobin, 1998, p. 156). However, there were some technical issues with the implementation of the application along with reports from some participants who felt a negative tediousness to the monotony of reading and posting week after week with no direct social interaction (Tobin, 1998, p. 157). Tobin's research provides some interesting insight for the [place]-based learning environment. A technologized space can provide opportunities for a whole separate set of social interaction. It can be used as a tool to promote reflection

and enhance a constructivist approach to knowledge acquisition. Combining these with other traditional [place]-based educational tools can provide a pedagogical bridge between technology and [place]. This study proceeded to do this with a portfolio web based interface called *Mahara*.

2.9. The History and Design of *Mahara*

Mahara means "to think, thinking, thought" in the traditional language of the Te Reo Māori who are an indigenous people of New Zeland. It was originally developed in New Zeland and released in 2006. It is funded in part by New Zealand's Tertiary Education Commission's e-learning Collaborative Development Fund (eCDF) which involves Massey University, Auckland University of Technology, The Open Polytechnic of New Zealand, and Victoria University of Wellington (*Mahara*). *Mahara* is an “e-Portfolio” system in contrast to most other web based learning environments like Moodle which are “Learning Management Systems” (LMS). They function very differently and serve different purposes. Moodle manages assignments, resources, grades and provides a space for discussion while *Mahara* is a e-portfolio system where students can creatively, and interactively, display their learning and participate in discussions.

Mahara e-portfolios combine the traditional architecture of the “three ring binder” portfolio into a digital world. Portfolios are essentially made up of two components: Artefacts and Reflections. These artefacts and reflections infuse meaning into each other which eventually creates a holistic narrative. Within the *Mahara* system students can create digital artefacts. This can be done in a number of ways, including digital artefacts they find off the internet or create through photography, video[7], audio or with a program. Students can also create non-digital artefacts, for example a drawing, and then digitize them through photography (many times a camera phone) or through scanning. This is something I had a number of students do in my class. Students then can create a reflective piece which can be written, audio recorded or video recorded; although the

[7] It should be noted that Mahara will not stream video and users must upload to a third party streaming site, like YouTube, and embed it into their Mahara page.

video has to be served through a third party like YouTube. *Mahara* organizes imported artefacts and reflections within a customizable table system so students can visually play and individualize how their portfolio looks. My study utilized the *Mahara* portfolio system as a way to enhance chronotope development within the student.

Currently the main focus of e-portfolios has been on higher education with the goal of students creating a place that a potential employer can go to view their work. There is very limited research on e-portfolio systems being integrated into middle or secondary school institutions or classrooms. However, I will do a brief overview of some of the research literature on e-portfolio systems.

The portfolio system of analyzing someone's work and learning has a long history and used to centre around the three ring binder; the goal of the portfolio is to create a place and space for someone to display their accomplishments. The e-portfolio system allows for a whole new multimedia structure and capacity for a whole new world of creative engagement (Seman, Rashid, & Nasir, 2012, p. 975; Metz & Albernhe-Giordan, 2010, p. 3564). The portfolio can be broken down into four components based on the intent of the author:

1. Learning, which is more private and reflective of ones progress and understanding in a course;
2. Presentation, which focuses on achievements within a course;
3. Evaluation, an outline and reflection of your skills;
4. Professional development, which is structured around ones career path and goals. (Metz & Albernhe-Giordan, 2010, p. 3564).

Holistically portfolios can be seen as a means to promote reflection and as a tool of life long learning (Oner & Adadan, 2011, p. 476; Chen, Yang, & Huang, 2015, p. 274). Some of the most common e-portfolio formats are blog, static webpage, power point or pdf (Seman, Rashid, & Nasir, 2012, p. 977).

Overall research into the use of the *Mahara* e-portfolio system within the context of higher education has shown generally positive results. In a study by Chen, Yang and Huang, which looked at implementing *Mahara* into a library context, students found a

high level of satisfaction (2015, p. 282). Another study which considered “reflective indicators” of pre-service science teachers showed a statistically significant increase in reflective indicators between the first and second reflective assignments; however, the data of the level of reflection itself had a wide spread from low to high (Oner & Adadan, 2011, p. 488). Additionally 94% of students in the study characterized their experience with *Mahara* as positive (Oner & Adadan, 2011, p. 487). In another study done with undergraduates, students saw *Mahara* as an important tool for organizing their work for job prospects after graduation (Metz & Albernhe-Giordan, 2010, p. 3566). The implementation of *Mahara* in this study will be discussed at length in Chapter 3.13.

2.10. A Pedagogical Orgy: Co-integration of Pedagogy

The (tri)force of this study, to use an old video game reference, is made up of three core components. At its base are the technological and cross curricular pedagogies and at top is an indigenous pedagogy and focus. These three components support the pedagogical heart which is [place]-based pedagogy. The diagram below pictorializes this structure.

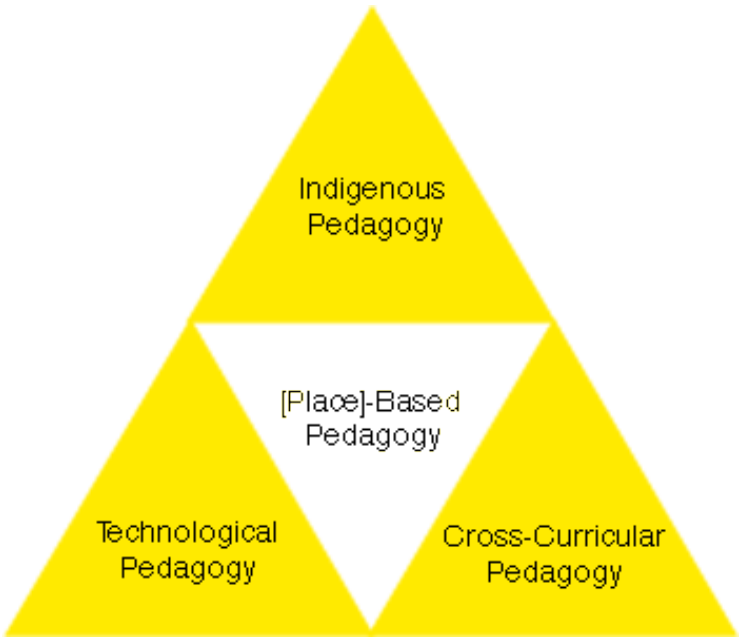


Figure 1. Pedagogical (Tri)force

As the picture illustrates, the centre triangle is dependent on the other three triangles being in their respective places; moreover, it is the centre triangle which provides the central focal point in creating the singular large triangle which holistically represents what I consider an "Eco[logical] Education" model in that all aspects of the (tri)force work like an interdependent ecology.

In summation, the pedagogical model I am proposing is an Eco[logical] Education. This model incorporates a dialogic relationship between [place]-based, technological, cross-curricular and indigenous pedagogies. First and foremost everything is centred around a [place]-based pedagogy. [Place]-based education should resist static interpretations, progress heterogeneously emergent cultural transformation and create a chronoptic dialectical social-anarchy. The technological, despite overtones of homogeny and control, should be fearlessly bent, twisted and distorted into our own local-communitarian designs. Cross-curricularity should take big ideas related to [place] and study them across the subjects creating an inter-subject dialogue. Finally, eco[logical] education should foster indigenous models of spirituality in all students,

indigenous and non-indigenous, which will create a relationship, respect, responsibility and reciprocity towards the Other/Nature/[Place].

Chapter 3.

Methodology

3.1. Introduction

When designing this study I considered the social and environmental context along with personal biases. In the centre of these considerations reside the questions into which you are attempting to gain insight. For me, all of these elements work together like a solar system interacting with their gravitational gives and takes. It is the gravity itself which comprises the methodology of the study. The methodology is what knits the study into place and keeps it balanced and insightful. Thus I wanted to construct a rigorous methodology.

After researching different methodological frames, I came to the position that a Learning Environments model with an enhanced focus on a mixed methods process would be the ideal way to gain insight into my research questions. My reading of Barry Fraser's work was a significant influence on this decision (Fisher & Fraser, 1981; Fraser et al., 1987; Fraser, 1991; Fraser & The, 1994; Fraser 1998a; Fraser 1998b). As outlined in section 2.2, the idea that the psychosocial environment had an effect on student performance and outcomes was clear to me both from observations during my time in the profession and through direct experience via my personal education. Along with the psychosocial environment I have been greatly influenced by David Zandvliet's idea that the physical environment itself has a direct impact on learning quality and engagement (Zandvliet & Straker, 2001; Zandvliet & Brown, 2006; Zandvliet, 2014). Finally, Kenneth Tobin's research into the learning environments of technology, specifically LMS based systems, also influenced my methodological approach to this study (Fraser & Tobin, 1991; Tobin, 1998). While there have been many other influences as outlined throughout

this thesis, these are the primary thinkers who drove my methodology and research forward. I felt that, to gain some real insight, I would have to combine these ideas and methods into my own personal research cocktail. Through this diverse and inductive mixed methods approach, I could tease out some insightful understandings about the *Gitga'at* learning environment I had co-created with students and perhaps insights into remote learning environments in general.

The purpose of this thesis is to formulate a case study through the use of a specific set of tools, like surveys and interviews, in order to gain insight into a remote indigenous population and their response to a [place]-based learning environment with a technological enhancements. Local ways of knowing through indigenous pedagogical tools were also major components of a [place]-based curricular structure as outlined by theorists like Cajete and others (Cajete, 1994; Kimmerer, 2013; Lupinacci, 2013, p. 189) . Additionally, this study considered the common challenge of "living in two worlds" that indigenous peoples feel (Barnhardt, 2010, p. 113). I wanted to understand how remote coastal indigenous students responded to learning environments which danced between the traditional and the modern; much like their current chronoptic experience. This is a well known dance for the *Gitga'at*, but as their youth with tell you, the pull towards the modern over the traditional intensifies each year.

3.2. Case Study – Theory

The use of the Case Study as a research tool and focus has been part of many research disciplines for a long time (Fraenkel, 2009, p. 430). While extensively used, Case Studies have also come under criticism. Since a Case Study is usually focused on a particular individual, classroom or school the applicability of the study's conclusions outside of the immediate context comes into question; furthermore, a Case Study's data is usually broad and incorporates a high level of qualitative data rather than quantitative data. Thus the Case Study has been criticized for lacking "scientific rigour", "reliability" and creates issues around "generalizability" (Noor, 2008, p. 1603).

These are all valid criticisms to take into account when proceeding with Case Study research or reading the results of a Case Study. However, a Case Study can also provide significant insight and guidance for other research or public policy and also raise useful questions for further research. A Case Study is grounded in empirical evidence from multiple sources and thus you can gain a holistic understanding of the phenomena under study (Gummesson, 1991, p. 83-156; Yin, 1989, p. 22-26). Additionally, multiple Case Studies can be done in succession, or subsequent Case Studies can be replicated, in order to verify conclusions or reveal nuances and differences based on population, location, culture, etc. (Fraenkel, 2009, p. 430). Finally, it could be argued that studies that are strongly weighted towards quantitative data, and attempt to formulate broad generalizations, are a bigger threat to educational policy than Case Studies. This is not a new thought and can be traced back to the satirical poetry of Francis Blair, Superintendent of Public Instruction State of Illinois, who wrote the following poetic jab at standardized tests and policy driven by quantitative data in 1920:

Poem 1 – Voice of the Standard Test

I am Solomon Frankenstein who after many sleepless nights,
In the laboratories of my print shops,
Recreated the collective, composite, average child,
And demonstrated a thousand ways of dissecting him
By means of quartiles, medians and graphs.
I am the chap who developed a scientific method
For compounding a sufficiently large number of errors
So as to derive from them a general, average truth.
I am the Doctrinaire Scientifique who invented
The pedagogic stethoscope for measuring
The systole and diastole of the ventricles of a child's brain;
The X-ray for revealing the figments in a girl's imagination;
The smoked glass for observing and measuring accurately
The sun spots on a solar system of a boy's soul.
But, chiefly, I am noted as the creator of all those progressive educators
Who by using my published, copyrighted standards and tests
And working to death all of the teachers, pupils and janitors in the district
Have succeeded in getting together, with a hay rake,
Enough stuff out of which to concoct a report or a book

> On the strength of which they have professed to another position,
> Leaving others to clean up the mess and bury the dead.
> I might have been living today had not some impossible devil
> Asked me why I did not invent a test for measuring
> The efficiency of my own tests. That was the fatal thrust
> That ran me through. And here I stand testing the
> Patience of all who come hither by repeating unceasingly
> "A tester in testing his own tests detested himself."
> (Blair, 1920, p. 31)

Extrapolating quantitative data without qualitative context and beyond the local environment can only give you a "collective, composite, average child". More is gained from performing Case Studies to inform and direct local public education policy rather than implementing broad pedagogical brush strokes at the provincial or national level.

For this research I was most interested in a Case Study approach because of its benefits for local educational policy within the *Gitga'at* context. A Case Study's intense focus on a particular subject, in conjunction with a broad base of data to inform its conclusions, allows for localized response to the community's educational goals. This study in no way assumes that its conclusions would be broadly applicable on a national, provincial or even municipal level. Rather, this study's conclusions should be used to inform and construct future Case Study research in other communities, geographies and economies in order to develop a localized educational response to the community's needs. This is not to suggest that the conclusions of this study are not relevant in a broader context but rather that the intent of this study is to encourage [place] appropriate educational responses to implementing [place]-based and technological learning environments.

3.3. Triangulation – Mixed Methods Model

Yet again I will delve into philosophical world of epistemology in discussing Triangulation which is the basis of the Mixed Methods studies. Over the past century there has been a vibrant debate about epistemological validity of research. Is the "truth"

that has been gathered an accurate reflection of reality/truth? Traditionally academia, especially in the hard sciences like medicine, have taken a positivist approach to research and focused solely on quantitative research which proponents consider "objective" (Ellingson, 2009, p. 13). Yet over the past couple decades the acceptance of a mixed method research model has been gaining strength even in parts of the medical field like nursing (Bekhet & Zauszniewski, 2012; Casey & Murphy, 2009; Risjord, 2001); however, there are still some strong criticisms.

Dissenters of the mixed methods studies claim that neutral objective and discoverable truth is only possible through a detached impersonal collection of quantitative data (Ellingson, 2009, p. 13). Thus qualitative data, which can be subjective, personal and contextual, moves away from the discovery of pure truth; a truth which transcends even the knowing of homo-sapiens or dolphins or bacteria. Furthermore, there are criticisms that in Triangulation there is no standard methodology, opaque definitions, no agreement on what exactly constitutes a mixed methods approach and that it privileges a more postpositive philosophy (Denzin, 2012, p. 82). Another point of strong criticism is that the mixed methods approach suffers from an "incompatibility and incommensurability" problem (Casey et al., 2009, p. 43; Denzin, 2012, p. 82). It is argued that the quantitative and qualitative methods are based on a different paradigm of assumptions and thus they cannot work together to gain knowledge but are mutually exclusive. This line of belief tends to also create a hierarchical knowledge structure where quantitative methods are seen as a higher form of knowledge (Ellingson, 2009, p. 6-7); however, other critics see each method as a particular understanding of reality each with their own power and advantage (Alexander, 2013). Learning environment studies tends to be an exception to this as they have traditionally utilized both qualitative and quantitative methods despite having come out of a more scientific tradition which tends to be dismissive of qualitative data. Also, from an epistemological view – the criticism is less valid for learning environments research because both quantitative and qualitative data are based on student perceptions of their educational experience, obtained in different ways and thus triangulated.

When going over the criticisms of mixed methods research the core premises are true; however, is the criticism valid? It is true that a mixed methods research model has no explicit standards but varies depending on research and philosophy (Thomas, 2006, p. 240-241). Yet his should not be a surprise since one common theme among mixed methods researchers is a rejection of the positivist's claim to absolute true knowledge (Ellingson, 2009, p. 31; Denzin, 2012); if there is no "absolute true knowledge" than there is no absolute true way of collecting data to understand reality. Advocates for a mixed methods model will very on their epistemological philosophy and process (Ellingson, 2009, p. 30-32). While this is problematic to positivists because it resists an *a priori* conception of the world, the mixed methods model relishes in conception of multiple, and even conflicting, truths existing simultaneously and in harmony. Thus, in mixed method theory, a decentralized epistemology is a more accurate reflection of truth because it has the capacity to represent truth in all its varying forms (Ellingson, 2009, p. 33).

Another reason for me choosing a learning environments frame is that it differs within regards to the either or debate of positivist and post-positivist philosophy. Learning environment models generally utilize quantitative data from statistical surveys as a starting point and base to the research while adding qualitative interviews and observations to colour the quantitative data (Fraser, 1998a, p. 1; Fraser, 1998b). This pragmatic take on the debate appealed to me as a more insightful method, especially in the social sciences.

Interestingly, despite not advocating for a pure truth like positivists, mixed methods advocates claim that their research is a more accurate reflection of truth than positivist. The argument is based on the idea that mixed methods research "is characterized by eclecticism, paradigm pluralism, a celebration of diversity, a rejection of dichotomies, an iterative approach to inquiry, an emphasis on the research question, and a focus on signature [mixed methods research] design and analysis strategies" (Denzin, 2012, p. 82). This creates a depth of study which a single method research cannot attain. The use of triangulation therefore creates a significant level of data completeness and confirmation (Casey & Murphy, 2009, p. 41). In this way, advocates

argue, the “truth” distilled out of the research is more valid and insightful than the traditional positivist model which creates a myopic truth. Learning environments research has a history of truth distillation through the combination of multiple data sets and triangulation and in many ways has been a leader in promoting a mixed methods approach to educational research.

The research presented in this thesis takes a mixed methods, or methodological triangulation, model in the tradition of a learning environment study. It does not seek to gain universal truths about learning environments which are applicable to all people at all times. In fact I resists such epistemological paradigms especially within the field of education and the social sciences. A positivist model for education research, known more popularly as “evidence based” educational research, seeks to develop panaceas for perceived educational deficiencies; this is because of the positivist claim that the quantitative rigour of “hard science” has been implemented and an objective truth about learning, which applies to all learners, has been discovered. Much of this research results in educational fads and trends, as the poet Blaire satirized earlier, which tend to be dislocated from place and supported by a corporate educational agenda. The research is top down in that it proposes a hypothesis and then imposes the hypothesis parameters unto its research subjects. This research takes a decidedly opposite view of knowledge; moreover, it challenges claims to educational universality and views the declaration of capital T Truth as patriarchal and elitist. This study espouses a chronoptic {truth} and rejects any capacity to claim Truth. In other words, {truth} is a local and emergent manifestation of reality tied to a particular geography, sociology, and time. I am using the signifier {truth} rather than truth in order to further dislocate the epistemological structures of this thesis from the traditional dogmatism which tends to emerge from Truth and a positivist world view.

So then, how does {truth} function within the context of Educational Knowledge? Educational Knowledge is hopelessly (non)static (incomplete, unfolding, situational) and can be seen as a biological entity eternally growing and evolving. In order to gain insight into this ever changing being you must continually probe its reality centres. That is to say, when Educational Knowledge is thought of as a biological entity in itself, our best

way to gain insight into this phenomenon is to analyze how it perceives or filters Truth into {truth} to construct its reality. Learning environments research is focused on this morphing of Truth into {truth} because its hones in on perceptions. That is to say learning environments research seeks out the participants' phenomenological reality which itself changes with time, culture and economics; thus its results are not *a priori* and can have no claim to Truth. Honing in on perceptions is best done through a mixed method approach with a focus on learning environments. By looking at the bio-being of Educational Knowledge through what Ellingson calls "Crystallization" in her work Engaging Crystallization in Qualitative Research we can being to tease out understanding and {truth}. In this book Ellingson uses the metaphor of a crystal, and its myriad angles and refractions of light, as the compilation of tools to gain insight into {truth}. This research uses this metaphor of the crystal as its epistemological centre.

3.4. Research Questions

This research was structured around an inductive quantitative-qualitative model. I started with three questions about learning environment phenomena and how these interacted together. These questions arise in part from my discussions with Principal Ernie Hill who had a strong desire to implement a media arts and technology program. Additionally this school is permeated with technology and the *Gitga'at* put a strong emphasis on learning technology. Hartley Bay School has a 1 to 1 laptop program for grades 4-12 in addition to 20 iPads for about 30-35 students and a SMART Board for every classroom and teacher. There is a strong push from the *Gitga'at* people to implement modern technology, media arts and [place] centric, or traditional, ways of knowing into the curriculum. While this in theory sounds like a good idea, and adheres to the rhetoric surrounding the "21st Century Learning" (BC Liberals; BCTF; BC's Education Plan) , there has been little consideration as to the effectiveness, or student perception, of this learning environment. This study attempts to give some research backing to the *Gitga'at* desires in education.

In conjunction with this the *Gitga'at* are concerned about the integration of traditional knowledge and ways of being. In short, the *Gitga'at* want to maintain a [place]-based educational structure. As noted in the literary review portion of this thesis, [place]-based pedagogy tends towards a tension with the root metaphors and embedded pedagogies of technology. So understanding the interaction between technology, [place]-based and indigenous pedagogies was a key piece to this research. The following questions were a result of these considerations:

1. How do indigenous communities and students perceive learning environments?
2. Does the addition of modern technological tools foster engagement and encouragement within remote indigenous communities?
3. Can intertwining of [place]-based and LMS/technological learning environments incorporate indigenous perspectives and enhance student performance?

The first question is structured to understand the [place]-based component to student learning. The second question is structured to understand the technological component to student learning. The final third question is structured to consider if the intertwining of these pedagogies functions well together or if the perceived antagonisms between them, in particular [place]-based/indigenous vs technology, overwhelm the capacity of either of them to function. So the first two questions allow us to consider if [place]-based/indigenous or technological learning environments are at all effective outside of their interaction together. Once this is considered the third question brings them together to understand if the two learning environments can actually enhance the overall learning experience.

3.5. Case Study – Process

The first process in this case study was to formulate a series of questions about how the learning environments of technology and place interact with the students. These questions persisted throughout the research and writing process; it is important to note that there was no hypothesis and thus the questions presented an inductive framework for the research. The goal was to have the questions be blank canvases on which the

data would be reflected and contextualized. Thus this research follows an inductive model whereby the conclusions emerge from the data.

The second process was to select the case to study. This, as noted previously in Chapter 1 and 2, was already locked in due to the social and geographical context of the study; this will also be expanded upon in section 3.15. Thus my choice was essentially a "convenience sample". However, there are a number of significant reasons for this choice beyond just convenience and geography. I have been using the pedagogical philosophies of Place-Based Education and Technology for the three years I taught in Hartley Bay. Thus, as a case study, my class represented valid candidate to probe the study's questions due to its curriculum choices, cultural vibrancy, social construction and physical context. This research in many ways represents the culmination of my pedagogical and curriculum development at this moment in time. Furthermore, as mentioned previously, research in remote and isolated indigenous communities can be challenging without a prior strong relationship among researcher and subjects and thus this represented an opportune context to study such a population. But, it should be clearly noted that my choice was also one of convenience as it was readily accessible and, of course, clearly willing to participate.

The third process was to select the research instruments to use. I opted for a set of instruments which would move within the boundaries between a positivist, post-positivist, critical theory and constructivist research approach; however, this research is weighted to a critical theory approach. Here is an outline of the instruments:

- *Subject Instruments*: Includes two modified PLACES and WEBLEI surveys by students. The methodology of these surveys is discussed in detail in Chapter 3.10 and 3.11 respectively. This represented a quantitative approach to understanding student perceptions of the learning environments surrounding them. The data gathered from this was used to structure the qualitative portion which included two recorded oral interviews with the students. These interviews were semi-structured in order to allow for individual nuances and flexibility (Noor, 2008, p. 1604). Broadly, the interviews consisted of conversations about the survey results. The cumulative class survey results, in Appendix A, were presented to the interviewee. While students did talk about their personal feelings and responses during the interview they were never required to and were purely a result of the conversation. The initial conversation and question structure was designed in an anonymous fashion:

"Why do you think the class responded in such and such a way?" rather than "Why have you responded in such and such a way?"

- *Researcher Instruments*: Includes field notes/journal in which the researcher collected ethnographic data about the subjects and learning environment. Additionally the researcher completed rating scales. The rating scale measured the researchers observations of student engagement and performance based upon the learning environment. The dependant variable is the rating scale and the independent variable is the learning environment. The researcher also collected data on the use of the Learning Management System (*Mahara*). This was done through the use of *Mahara* log files and Google Analytics.
- *Informant Instruments*: Are parents and other community members involved with this research responding to recorded oral interviews or notes about conversations with the teacher/researcher. In particular, I interviewed two community elders about the historical context of education and curriculum within the *Gitga'at* community and the case under study. Additionally, parents were at times involved in the educational process and I took notes on observations and conversations I had about the perceptions of the learning environments. Finally notes about conversations with parents on Parent Teacher meetings. This study does not rely heavily on the *Informant Instruments* but uses it as one more triangulation tool.

The fourth process was to conduct the study after ethics approval from SFU's Office of Research Ethics which gave ethics approval on March 19th, 2015. The study was conducted for 19 weeks between March - June 2015. The first survey set given was in the first and second weeks of April. The second survey set was given at the beginning of June. All other observations and data collection occurred between March to June 2015.

The final process was coding qualitative data, data analysis, drawing conclusions and finally writing about the case study. After the field work had been done there was a massive amount of data accumulated from a myriad of sources which is characteristic of an in-depth mixed method triangulated case study. On the whole this data can be seen as confusing and disjointed; however, once collected my first task was to being sifting out and coordinating the relevant data to the study through a mixed methods process. The specifics of this process, theory and philosophy are outlined in sections 3.7 and 3.8.

3.6. Participatory Action Research and [Place]-based Design and Structure

This study was primarily centred around a [place]-based learning environment with a supportive technology component. In particular the [place]-based structure was embodied in the *Lu lax kyook* Ecological Monitoring Project (LEMP). The study focused on the implementation of this learning unit which spanned from February to the end of June.

Having the luxury of teaching multiple subjects provides a great opportunity to implement a cross-curricular approach to unit design. This is a [place]-based structure that I discussed in the Literary Review chapter. Thus the LEMP was designed across subject boundaries. Each subject became part of an entwining web of experience. LEMP was a project based unit where students were given mini-projects which moved them towards the goals of the holistic project LEMP. Furthermore, LEMP was created with the specific intent on facilitating chronotope realization and development within the students.

LEMP followed a Participatory Action Research (PAR) model of design and implementation. At the beginning of the year in September of 2014 the students participated in a unit design workshop. This was done over four days for about 2 hour period for each day. Students were initially asked about what was important to them in this [place] and what they wanted to gain more knowledge about. Students worked individually, in small groups and as a class. They produced their thoughts, ideas and feelings through the use of writing, drawing and orally with discussion. The class then took all these ideas and we created a broad outline of a unit the class wanted to do. Broadly the students wanted to learn more about their culture and territory with a focus on hands-on learning and experience. There were many ideas of how this could happen, however, there are always practical considerations which come into play. Once this initial workshop was over I began constructing the practical application of the student's desires. This evolved into LEMP – the context for this study.

LEMPs development came about through a community consultation process. Once the students had come up with their ideas, I proceeded to organize with the school

administration, *Gitga'at* band office, the *Gitga'at* Guardians, elders, parents and community members. This process took until Christmas. The end result was the *Lu lax kyook* Ecological Monitoring Project. The practical considerations for this were time, money and proximity. While it would have been great to do some research in "Old Town" or around "Kiel" like the students had suggested, these places are about 45 minutes on a fast boat which makes them impractical from both a time and money perspective. *Lu lax kyook*, or "Mossy Bay", is an estuary about 2 km away from Hartley Bay and about a 5 minute boat ride. Due to its close proximity and easy access it was decided that this was the best place for the LEMPs project. Additionally, the Guardians were interested in gaining some baseline data for this area so it worked well with their goals.

Once the [place] of LEMPs had been worked out, I developed a curriculum in coordination with the Guardians and elders of the community while continually referencing the student's unit workshop results. My goal was to have it move across subject boundaries with the view that such unit development creates deep knowledge rather than surface knowledge. The students would study *Lu lax kyook* from multiple subject areas and perspectives thereby formulating their own chronoptic structures of [place] through a critical inquiry process. Eventually the cross-curricular structure for LEMPs was broadly outlined as follows:

- Language Arts
  - Sm'algyax: Students researched the traditional words for the area in relation to the science and socials data.
  - English: Students wrote reflection journals on *Mahara*. Students also created pages conveying their learning and creating their knowledge.
- Social Studies
  - Students researched harvesting areas and methods through the use of maps and elder knowledge and teaching.
  - Students interviewed elders about their personal histories and stories with *Lu lax kyook*.
  - Students researched traditional stories and mythologies and considered how they are reflected in the landscape.
  - Students considered how their research functioned with their modern realities.

- Science
  - Students collected a range of baseline data on the estuary from salinity and temperature to water flow to aquatic/fish populations to grass and harvesting plants.
  - Students considered both traditional and modern land management techniques
  - They learned land navigation techniques both on land and water.
- Physical Education
  - Students hiked, pulled traps and scientific gear.
  - Students learned about proper safety procedures when hiking and being physically active in outdoor remote situations.
- Art and Media
  - Students created a couple art projects
  - Students documented their learning and adventures through the use of video, photography and audio
- Computers and Technology
  - Students utilized technology to organize their thoughts and communicate their learning
  - Students learned how to utilize technology for their own [place]-based purposes and the general functioning of technology in general.

The LEMPs curriculum represents an exhaustive [place]-based constructivist learning environment. Students co-designed its structure and were involved in all the research which took place. The research itself also supported the work of the *Gitga'at* Guardians and their stewardship responsibilities and goals. LEMPs adhered to the creation of a chronoptic knowledge for the students and community. Rather than being defined by an external reality, like Enbridge or Hollywood, the students and community participated in creating a local dialectic through which they filtered the reality of [place]. Students expressed this process through an online program called *Mahara* and through their Media Arts documentation.

3.7. Triangulation – Mixed Methods Process

The research presented in this thesis uses an "across-method" methodology; this is defined as using both quantitative and qualitative data (Bekhet & Zauszniewski, 2012, p. 40). As stated previously, the two primary data sets used are the quantitative surveys and the qualitative interviews. This primary data set uses a sequential triangulation style (Casey & Murphy, 2009, p. 41). Put simply, when one method is used first, either qualitative or quantitative, and informs the structure of the other method, either qualitative or quantitative, then you have a sequential triangulation. This is in contrast to simultaneous triangulation in which both qualitative and quantitative is being recorded at the same time (Casey & Murphy, 2009). It was decided that sequential triangulation for the primary data set was the best method for a few reasons. Firstly, it allowed for a set of quantitative baseline data to be recorded which was anonymous and thus not subject to potential influencing factors. Secondly, this "influence neutral" data was then used to structure and inform the qualitative interview sessions. Students were shown the collective quantitative data and asked to interpret it themselves. If students were unclear as to what a certain data set might mean they were prompted to give a potential definition based upon the title and context of the category. At this point some students might have still been reluctant to give a definition. If this was the case then the interviewer and the interviewee would work together to build a conceptual definition that the student would understand. At times, to gain clarity the interviewer would restate what the interviewee had said. This restating always coincided with explicit "stakeholder checks" to maintain trustworthiness (Thomas, 2006, p. 243; Ellingson, 2009, p. 41). All of this data was recorded with an audio recorder and eventually transcribed.

The primary sequential triangulation data set was gathered at two different times to analyze two different perspectives of the same issue. The first set was looking at the *Preferred Learning Environment* (PLE); the second set looked at the *Actual Learning Environment* (ALE). When interviewing for the second ALE data set, students were also shown their previous survey answers from the PLE and asked to explain their perception of variances from the two surveys. These two data set collections were separated by about 3 months. This was done to make sure there was enough space between the

surveys so that their answers to the PLE would not affect their answers to the ALE. Furthermore, through this triangulation method students were able to go through a process of reflection and consideration. Students could reflect on why the class's Preferred Learning Environment was better, same or worse than their Actual Learning Environment.

In addition to the survey data this research collected quantitative usage data about the *Mahara* portfolio website. This was the only other quantitative data set used. Usage data was gathered through two statistical analysis sources. The first source is the *Mahara* website itself which tracks a limited amount of user data. The second source was the use of Google Analytics which collects a fairly rich set of data. Through this data I could analyze sessional uses, number of pages visited, length of visit, type of material posted or created. All of this data was anonymous and cannot be traced back to any individual user.

Finally, secondary data sets included a variety of qualitative sources including student reflection blog, interviews with elders, my teaching journal, researcher/teacher observations and conversations. All of this secondary data was juxtaposed with the primary data to understand and reaffirm the primary data collected by the surveys, interviews and website usage. To maintain Ellingson's crystal metaphor, we could see the three primary data sets as the primary points on the crystal and the secondary data sets as a multitude of cuts to further refine the light of {truth} being refracted in the crystal. Through the use of this mixed methods approach the research results gain a level of "rigor, breadth, complexity, richness, and depth" (Denzin, 2012, p. 82).

3.8. Data Coding

One of the challenges of a mixed method study is the large amount of raw data collected. For this data to be meaningful and relevant it needs to be condensed and coded (Thomas, 2006, p. 238). The process of coding data in mixed method / qualitative research is standard across this type of research and gives the research the level of rigour required to make its {truth} claims; however, the process and how the data is

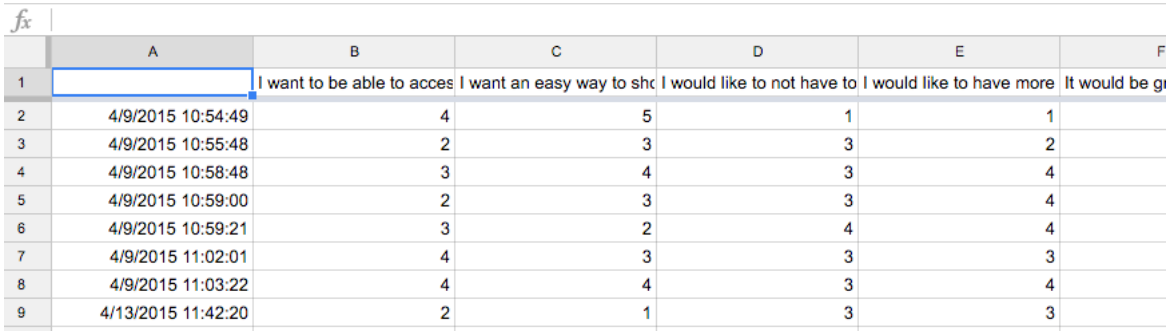
coded has no standard and can be radically different from study to study (Bekhet & Zauszniewski, 2012, p. 43; Casey & Murphy, 2009, p. 46-52; Ellingson, 2009, p. 56, 64, 128, 140; Risjord, 2001, p. 44, 49; Thomas, 2006, p. 238-242).

The coding methodology in this study maintains the general-inductive basis of this research; moreover, the interview data coding followed a "goal-free" system (Thomas, 2006, p. 238). In other words, rather than coming to the interview data with a pre-determined set of categories, the categories are developed from a close reading of the data. That said, due to the categories of the surveys, and the focus on the surveys for interviews, the interview categories do reflect the survey categories in many ways. Here is an outline of the coding process:

1. Organization of the quantitative data into broad generalized categories.
2. Calculations of the mean, standard deviation and P-value of the quantitative data. This was done for reference and context since the quantitative data cannot be considered statistically relevant due to the limited amount of participants. Despite not adding statistical significance, it is my feeling that viewing the broad brush strokes of student responses, particularly through the mean and standard deviations, gives a level of insight into student perceptions in addition to providing a foundation for collecting quantitative data.
3. Graphing of quantitative data and calculations
4. Multiple close (re)readings of quantitative data
5. Transcription of student audio interviews
6. Multiple close (re)readings of transcriptions
    a. During each reading brief summaries are created and a consideration / comparison of themes / ideas is developed.
    b. Close readings are done at least a couple days apart, never back to back. The goal is to see the data with fresh eyes and mind.
7. Development of categories for the qualitative interview data.
8. Final (re)reading of quantitative and qualitative primary data and coding of the data.
    a. Data was colour coded to reflect single interview session.
9. Final statistical and qualitative analysis of primary data

The qualitative data is the most important data set in this study. As mentioned previously, my participant numbers were too low for any statistically significant data to emerge. However, this does not make the quantitative data less relevant. Rather it inverses the role of the qualitative and quantitative data relationship. Normally, within learning environments studies, the quantitative data is the foundation on which qualitative data and conclusions are built; yet in this case the qualitative data is the foundation on which conclusions are built. The quantitative data should be seen as data which gives colour and vibrancy to the qualitative interview data.

My process for condensing and tabling the quantitative data was fairly simple since it was already in a digital format. I downloaded the raw ".csv" (comma separated values) file from my Google Forms account. The initial data looked something like this:



	A	B	C	D	E	F
1		I want to be able to acces	I want an easy way to sho	I would like to not have to	I would like to have more	It would be g
2	4/9/2015 10:54:49	4	5	1	1	
3	4/9/2015 10:55:48	2	3	3	2	
4	4/9/2015 10:58:48	3	4	3	4	
5	4/9/2015 10:59:00	2	3	3	4	
6	4/9/2015 10:59:21	3	2	4	4	
7	4/9/2015 11:02:01	4	3	3	3	
8	4/9/2015 11:03:22	4	4	3	4	
9	4/13/2015 11:42:20	2	1	3	3	

Figure 2. Raw Google Forms Data

As you can see all responses were anonymous and only time stamped. After downloading the .csv files I opened it in Excel and grouped the individual statements into their respective categories. Once done this process I used Excel's robust equation systems to calculate the Means, Standard Deviations and p-Values. Here is an example of what that looked like:

Timestamp	access my school work from anywhere.	my parents/relatives/guardians what I am doing at school.	school materials to and from school as much.	onli
6-11-2015 11:28:46	1	1	3	
6-11-2015 11:30:28	1	1	2	
6-11-2015 11:34:43	2	3	3	
6-11-2015 11:36:38	3	3	3	
6-11-2015 11:36:34	4	4	3	
6-11-2015 11:36:45	3	3	3	
6-11-2015 11:38:50	4	3	4	
	2.571428571	2.571428571	3	
	Emancipatory Activities			
			2.571428571	
			2.571428571	
			3	
			2.571428571	
			3	
		Catagory Mean	2.742857143	
		Standard Deviation:	0.950011057	

Figure 3. Raw Google Forms Data Categorized in Microsoft Excel with Equations

The Excel equations I used were as follows: Mean =AVERAGE(); σ =STDEV(); p-Value =TTEST(). So, for example, the "Category Mean" Excel equation in the screen shot above is "=AVERAGE(D11:D15)". My process was very similar for the statistical usage data. Google Analytics and Mahara allow you to download .csv files of the data. In both those cases the data was already categorized based on their own mechanisms. I then ran those categories through Excel's equation mechanisms.

In addition to the two primary data sets of qualitative interviews and quantitative surveys, this study utilized multiple other secondary data sets to triangulate the results of the primary data set. The two most significant secondary data sets were my researcher journal and statistical usage of the website. During the research I kept a personal journal documenting my thoughts, ideas and feelings about the day along with a rating scale. I was careful to highlight student behaviour and engagement levels. Generally I would rate my perceptions on a 5 point scale and then write some contemplations.

In addition to my journal I also utilized statistical data for the website. This data was all gathered anonymously through the imbedded *Mahara* statistics and Google Analytics. Each collected their own particular data. Tertiary data sets included observations not directly related to the curriculum implementation, historical research,

involvement in ceremony and feasting traditions, and conversations with parents, elders and community members. At one point I had an in-depth conversation about [place]-based and technological education with the village matriarch Helen Clifton and also Ernie Hill the former principle of Hartley Bay School and chief of the Eagle Clan. These were both interesting and insightful. However, all tertiary data was the background radiation, to use a term from physics, in order to the to help contextualize and interpret the primary data sets.

Finally, I would like to note that with so much data there were parts that were judged to be irrelevant to this study. Irrelevancy was considered to be data which had no direct impact or insight into the three research questions outlined in Chapter 3.4. During the data coding phase of the research, any data which was not considered pertinent to the research questions was disregarded.

3.9. Contextualizing Quantitative and Qualitative Data

The results of this study relies most heavily on the qualitative interviews conducted. The reason is that the sample size of this survey is too small to create any statistically significant data. While I did go through the process of calculating the means, standard deviations and p-Values for the survey results, they should be seen as the frame around the window of the survey results; additionally, to extend the metaphor, the qualitative data should be viewed as the supporting structure for the study results. The quantitative data has no meaning without the supporting structure of the qualitative data. This provides an interesting reversal of roles for how many learning environments research results are traditionally structured. Generally the quantitative data provides a foundation for the results in learning environments research. However, this doesn't make the results any less valid or potent for its local context and [place]. Yet, admittedly, it does make the results less applicable to situations outside the Hartley Bay community. Thus these results should be used to inform and construct other local case study approaches in order to develop [place]-appropriate educational policy.

3.10. PLACES Survey

The PLACES Survey was an important tool in the survey instrument portion of this study. This tool provided the baseline upon which the more informative qualitative data was create. In order to best understand the results of a tool it is good to know its history and development.

During Zandvliet's work in developing the Environmental Learning and Experience curriculum guides for the BC Ministry of Education, he realized that there was a gap between developing the curriculum and assessing particular elements of a [place]-based learning environment (Ormond, 2013, p. 53). Eventually Zandvliet implemented a small pilot study with a few in-service teachers and a participatory research structure (Ormond, 2013, p. 54). This initial study combined and modified survey elements from four established instruments: Environment Science Learning Inventory (ESLEI); What Is Happening In this Class? (WIHIC); Science Learning Environment Inventory (SLEI); and Science Outdoor Learning Environment Instrument (SOLEI) (Zandvliet, 2012, p. 131). The second phase of development consisted of focus group analysis which whittled down the overall constructs to eight (Zandvliet, 2012, p. 132). These constructs are broken down into a series of questions which hone in on the constructs theme and utilize a Likert type five-point scale (Zandvliet, 2012, p. 133). Eventually, the Place-based and Constructivist Environmental Survey (PLACES) was developed. The PLACES Survey was validated by processing it through a factor analysis, Cronbach alpha reliability and one-way analysis of variance (Zandvliet, 2012, p. 134-137).

The PLACES Survey has been used in a number of studies. Carlos Ormond utilized it for his PhD dissertation of the SEEDs teacher education module at Simon Fraser University (2013). In combining the PLACES Survey results with his qualitative data, Ormond found that there was strong positive link between both types of results (2013, p. 196). Similar positive links between the PLACES Survey and qualitative data have also been confirmed (Zandvliet, 2014, p. 23). It should also be noted, and as expressed in section 2.7 of this thesis, that [place]-based education, and analysis of its

learning environment, is subordinate to the chronotope dialectic. In other words, while the overall theme, structure and design remains the survey can be tweaked to reflect the local [place]. As such, while the PLACES Survey provides a stable and consistent infrastructure, its internal nuances can be shifted to reflect the chronotope in which it is analyzing (Zandvliet, 2014, p. 21). The PLACES Survey in this thesis reflects a modified form.

The original PLACES Survey was structured for a post-secondary learning environment based in the metropolitan of Metro Vancouver. Thus the survey was modified to be more relevant to the [place] in which it was being implemented. In this case Grade 6s to 8s in an isolated coastal village on the north coast of British Columbia. I changed some of the overall language to reflect the vocabulary of the students; additionally, two questions were completely rewritten. The original questions are:

Group Cohesiveness (GC)

17. I want to get to know other students.
19. I want students get to know each other well through participation in classroom activities.

These question were changed to:

Group Cohesiveness (GC)

17. I want to build better relationships with other students.
19. I want students in this class to support each other and develop stronger community dialogue

These questions were changed due to the social context of this study. All of the students in this class have long histories with each other which span their entire lives; moreover, all of these students are generally interconnected to each other in someway through being members of the *Gitga'at* Nation. Thus, for these students, "getting to know other students" is not as meaningful as "building better relationships" or "supporting each other and developing stronger community dialogue". These phrases provided a more accurate reflection of the *Gitga'at* student reality.

This survey was given to the students twice: once at the beginning of the research in April and again at the end in June. All the questions were digitally written out and put onto a Google Forum. Students followed links to the survey from the *Mahara* website. Results were completely anonymous and were retrieved from a Google Docs spreadsheet. The modified questions and survey can be seen in Chapter 4.2.

3.11. Technological Learning Environment Questions

One of the unique aspects of this research is its inquiry into how technology functions within the context of a [place]-based pedagogy and a remote indigenous sociosphere. I wanted to gain some insight into this so I adapted a survey which measures technological interaction. The best way to understand an instrument is to consider its history and structure.

The precursor to the Web-Based Learning Environment Instrument (WEBLEI) was a survey used by Kenneth Tobin in a study about a computer application called "Connecting Communities of Learners" (1998). The major three scales of the WEBLEI survey were constructed by Tobin. The first scale was "Emancipatory Activities". These questions centred around the capacity for "convenience, efficiency and autonomy" (Tobin, 1998, p. 150). The idea was that web environments for learning should allow the student more freedom and autonomy to participate when they are able and with a more open schedule. Rather than come to class at a specific time and learn in a more regimented way, the student has the capacity to make more efficient decisions about their time management and how they learn. The second scale was "Co-Participatory Activities". These questions centred around the capacity for "flexibility, reflection, quality, interaction, feedback and collaboration" (Tobin, 1998, p. 152-153). The focus here is to analyze how the web environment functions within a community context along with the capacity for meaningful dialogue and reflection. In a classical classroom setting there is a cross-pollination of ideas and the capacity to do collaborative work within a group setting. The sufficiency of the web-based environment to facilitate this valuable pedagogical tool is a focus of this survey. Tobin's final scale was "Qualia". In his paper

Tobin connects the ideas of "interest, curiosity, enjoyment, satisfaction, stimulation, appreciations" to the neuroscientific notion of knowledge being physically manifested through electrical charges on the matrix of neurons in the brain[8] (1998, p. 155-156). While the epistemology of this could be argued, at its core these questions are analyzing the adequacy of web-based learning environments to facilitate an aura of fulfilled engagement among participants.

Eventually Vanessa Chang and Darrel Fisher took Tobin's work and developed and validated the survey into its current WEBLEI form (2003). Their focus was on post-secondary education and they added one more major scale to Tobin's work: "Information Structure and Design Activities". These questions honed in on the overall structure and design the web-based learning environment (Chang & Fisher, 2003, p. 10-11). It considered how the space functioned in relationship to the other three components of Tobin's study.

Validation of this survey took place at Curtin University in Australia. It surveyed 344 business students who took an Electronics Commerce course (Chang & Fisher, 2003, p. 13). They put the survey through the Cronbach alpha reliability coefficient with a positive result of 0.68 to 0.87 which confirmed their internal consistency (Chang & Fisher, 2003, p. 14); moreover, they also got scores of 0.37 to 0.49 in their discriminant validity which revealed only minor overlap between scales within the WEBLEI survey (Chang & Fisher, 2003, p. 15). When applying this survey in the field they found that most often students were generally satisfied with their web-based learning environment experience with means between 3.37 and 3.96 and standard deviations between 0.51 and 0.57 (Chang & Fisher, 2003, p. 15-16). Therefore the WEBLEI survey instrument is an excellent tool for measuring or describing student perceptions of a web based technological learning environments.

As the WEBLEI name suggests, this instrument was primarily geared to web based environments. However, our learning environment was primarily [place]-based in

[8] I personally dislike the physicality of this epistemology and think it is too reductionist. Thus I shifted the conceptualization of this in my use of this section of the survey. This is highlighted in the methodology chapter.

addition to using multiple forms of technological interaction beyond just the web environment. Furthermore, I wanted to know how the culture of [place] interacted with the culture of technology. Finally, the WEBLEI survey was created for post-secondary students and thus was not totally applicable to remote grade 6s to 8s. As such I modified the WEBLEI survey to compensate. The overall shell and structure of the survey remained consistent as well as the overall intent of the questions/statements. Thus the survey retained all the WEBLEI categories. However, since I wanted to also analyze beyond just the web environment I added two more categories: *Indigenous Culture (IC)* and *[Place] and Technology (PC)*. This helped broaden the focus of the survey. This modified survey can be found in Chapter 4.3.

3.12. Qualitative Interviews

Due to this study's low number of participants the qualitative interview part holds significant weight within regards to the study's conclusions. I collected the qualitative and quantitative data in two sets as previously discussed. During both sets the quantitative data would precede the qualitative data collection portion. The process was:

- First Data Set
  - Quantitative data gathering through an online anonymous Google Forum questionnaire.
  - One week after quantitative data collection I interviewed the students about the PLACES survey results.
  - One day after the PLACES survey interview I proceeded to interview students on the modified WEBLEI survey results
- Second Data Set
  - Quantitative data gathering through ans online anonymous Google Forum questionnaire.
  - One week after the quantitative data collection I interviewed the students about both the PLACES and modified WEBLEI survey results in one oral interview.

The compression of the second oral interview was due to the time constraints at the end of the year since this was done in the last week of school. Additionally, since the

results of the both the PLACES and modified WEBLEI survey remained mostly the same I only wanted to focus in on changes and variances rather than rehash the entire first interview. As a result the data collected from the second interview set was not as extensive but rather more focused and in-depth on particular variances between surveys.

These qualitative interviews were implemented with a conversational design. Before each interview set I would first categorize the quantitative data and find the means and standard deviations for each category. At this point I graphed the means for each category and used this visual representation of answers as the core for my conversational design. Once I had the categorical means graphed I developed a few conversational topics based on the results. These topics were linguistically constructed to be non-personal and conceptually focus on the class responses as a whole.

Students' response capacities varied from student to student. Most students naturally began talking about themselves despite being directed to talk in more broad terms. If this happened I just let the conversation develop however it materialized. For my students it appeared to be easier to talk about themselves and their personal experiences rather than speculating about the class's experience as a whole. Additionally, some of my students struggle with more abstract levels of thought and discussion. If I found a student was not understanding, or conceptualizing, the original discussion topic, I would often reword or explain unclear parts. For some students it was easier to ask more pointed yes or no questions and then attempt to get reasons for their answer. Overall there was no linear structure to the questions or interviews. The only cohesive focus was the class's means on the overall topics and categories.

3.13. *Mahara* – Structure and Methodology

Mahara is one program with significant potential to augment and support constructivist pedagogies and was the main online environment for the research done in this thesis. *Mahara* is an open source web based software which is relatively easy to implement within a Linux OS environment if you have some limited understanding of

Terminal commands, Apache 2, and MySQL (*Mahara*). I initially installed this onto Ubuntu 12.04LTS for a trial run and then integrated it, without too much trouble, into Hartley Bay School's Apple OS X web service which shares many of the same core structures with Linux. It does take some ingenuity, forum searching and overcoming some frustrations; moreover, there is no official support for OS X or Windows (System). Another limiting factor is that *Mahara* is a very rigid system with no "responsive" capabilities; responsive websites allow users to view them on a variety of devices (computer, tablet, cell phone) and the website itself will display, or respond, accordingly.

Despite having some limiting factors to the website I chose *Mahara* for its non-linear structure, promotion of creative constructivist expression, and capacity for multi-media expression. Most web-based learning programs are "Learning Management Systems" (LMSs). LMS is geared towards presenting course content and accepting assignments which are private and can only be accessed by the teacher or system manager/administrator. In contrast *Mahara* is a portfolio-based system which is easily sharable with class members and the world. This type of system lends itself much better to constructivist and co-constructivist epistemologies. Moreover, *Mahara* has a relatively open ended capacity for knowledge construction over an LMS system like Moodle.

Throughout the course students were required to express their learning through the creation of "pages". These pages incorporated mainly writing, pictures and drawings in juxtaposition in order to create meaning. This meaning making process was an important part of the study. I was interested in how technology can be used as a culturally creative tool rather than a culturally consumptive tool; moreover, in what ways can technology promote a [place]-centric chronotope. *Mahara* created a (space) for that. Additionally, *Mahara* also created a (space) where students could share their knowledge and have dialogue with each other. Thus *Mahara* was also an attempt to ferment a cross-pollination of knowledge in addition to a community (space) where students build new and alternative relationship than the ones traditionally created on Facebook or other social media.

One way to analyze effectiveness of a program is to consider the overall usage of it. For this study usage was scrutinized utilizing analysis of statistical data from the *Mahara* program itself in addition to Google Analytics which I setup on the website. Each tool provided a unique insight into usage of the website.

The ultimate purpose of utilizing this technological learning environment was to enhance the [place]-based curriculum by creating a digital (space) for knowledge to be expressed about [place]. In this way the technological tools, which usually act as a homogenizing force can become (re)-purposed for [place] and facilitate a local centric chronotope.

3.14. Other Technological Tools

While *Mahara* was an important technological tool there were many other tools which were used. Each student was given their own Macbook Pro laptop. These laptops represented the digital interface through which students organized, developed, interacted, created and conveyed their learning. Students also utilized video cameras and digital audio recorders. Additionally, part of the *Lu lax kyook* monitoring project utilized digital technology like flow meters and temperature/salinity monitors. Also, all observational data was digitized and sent to the *Gitga'at* Guardians along with maintaining copies on the school server. Students utilized a myriad of technological tools during their journey with a [place]-based learning environment.

3.15. Clarification of Extra-Researcher Roles

The researcher is also the teacher of the students in this study. This is in part due to the extreme remoteness of the population under study and the challenge of gaining trust and accessibility to the community and students. There are multiple request each year to do studies in this school but they are all rejected due to the lack of relationship, trust and housing. Thus, for educational research to get done in this community, it is best done by an insider or someone with deep connections to the

community. This research provides a unique opportunity to gain some insight into how learning environments effect student perception and performance in this community and remote indigenous BC populations in general. Much of this was already discussed in the Forward and Chapter 1 of this thesis.

When dealing with a dual role in research (both teacher and researcher) the obvious questions of undue influence arise. How does the researcher's role as authoritative teacher/grader juxtapose with that of researcher/observer? It is undeniable that this presents an overall colour to the research presented in this study. However, there were a few ways in which undue influence was mitigated:

- The quantitative data survey collection was done anonymously and in a digital format so it was impossible to tell who answered in what way.
- Students were continually told, and expressed understanding, that nothing they said and did in relationship to this study would affect their grade or progress in this course; furthermore, students were continually told, and expressed understanding, that, for this research to be effective and benefit them, truth was paramount otherwise the final conclusions of this research would be based on false premises. In fact this whole issue became a learning opportunity in the class to discuss the concept of research in general.
- An open and trusting relationship between the students and the teacher.
- A genuine mutual desire between students and teacher to do research which will benefit everyone.

Another way in which undue influence was intended to be mitigated was through a 3rd party interviewer, a Hartley Bay teacher by the name of Lynn Hill; however, her husband, Ernie Hill mentioned previously, became very sick and she was not able to do the one-on-one interviews. Thus all the interviews were done by me.

It is at the point of the verbal interviews that undue influence would be most present. However, there are some points to make here. Firstly, all the interview questions were structured as responses to the anonymous classroom surveys not an individual student's personal beliefs or feelings; further, oral responses are triangulated with the survey responses to see if there are any statistical "outliers". During these interviews students were prompted to respond to the classroom survey data rather than talk specifically about themselves. Verbal response questions were framed in the

following manner: “Why do you think the class responded in such and such a way?” rather than “Why have you responded in such and such a way?” By focusing the verbal interviews on the anonymity of the cumulative responses to the classroom surveys, students could discuss the class perspective in general rather than individual responses in specific thereby alleviating pressure to “say the right thing” to the teacher since they were not required to talk specifically about themselves; however, students generally talked about themselves despite not being prompted to do so. There are two possible reasons for this. Firstly, students did not feel threatened by my presence; secondly, students at this age have a much easier time conceptualizing and discussing themselves rather than an abstract social entity like a “class”.

Additionally, a long standing solid relationship of trust was built up over my three years teaching these students. After this many years with these students they were very comfortable communicating with me. When they did not like something I was doing the students would be vocal in their opposition. It is my view that the oral interviews I did were much richer due to the long standing relationship I have with the students and how comfortable they were with me. The *Gitga’at* culture tends towards being closed and distrusting of outsiders despite being very friendly to them; but once you have gained their trust they open right up and bring you in. Due to this I would argue that having an unknown outside researcher might hinder the oral interviews as the students would be less likely to open up. Thus, ironically, an outside researcher might unwittingly have negatively influenced, or their presence would negatively colour, the responses of the students who are less likely to open up to an outsider.

My role as a community member in the *Gitga’at* village must also be noted. When working in a small village setting it is impossible to completely separate your personal and professional life. Thus, not only was I a teacher and researcher, but I was also a community member. Some of the students in this study would come over to the house and babysit my children. My family would invite the family of some of my students over and I would eat dinner with them and their parents or vice-versa. We would have many interactions outside the school/research environment including during feasts, ceremonies and community events. This of course is all very normal to the *Gitga’at*

children and completely unavoidable. However, it is also this level of familiarity and comfort which has created a richer data set. The students saw me in a multiplicity of roles like Teacher, Researcher, Community Member, Pallbearer, Wedding Photographer, Community Organizer, Hunter, Fisher, Father, etc. As an example of this comfort level, students would joke that I was no longer a "*k'amksiwah*" (white man) but Indian like them. It is a deep trusting relationship like this which mitigates any level of negative influence which might occur.

Finally, qualitative research owes much to the forbearers of phenomenology and its influence on epistemology which I have already discussed at some length in Chapter 2. There are two distinct branches of phenomenology: descriptive (Husserl) and interpretive (Heidegger). The descriptive branch of phenomenology contends that one can rid themselves of all preconceived ideas and notions, what Heidegger would call "being-in-the-world", through a process called "bracketing" in order to understand the essence, or *a priori*, of a thing; the interpretive branch of phenomenology rejected this type of Cartesian dualism focusing on the process of Da-sein thereby suggesting it was impossible to separate oneself from the world (Lopez & Willis, 2004, p. 727-728; LeVasseur, 2003, p. 413-414; Tufford & Newman, 2012, 82-83). In the words of Heidegger himself:

> Meaning is an existential of the Da-sein, not a property which is attached to beings, which lies "behind" them or floats somewhere as a "realm between." Only Da-sein "has" meaning in that the disclosedness of being-in-the-world can be "fulfilled" through the beings discoverable in it. Thus only Da-sein can be meaningful or meaningless (1996, p. 142).

In other words, meaning itself becomes an interpretive process of the Da-sein rather than a descriptive process of the "being" out there. From an interpretive perspective, it is impossible to bracket out the process of being-in-the-world because it would reject the very instrument of perception.

My approach to this research adheres to interpretive phenomenology. Thus I in no way attempted to bracket out my preconceived notions and ideas throughout this research project. In fact, given that I was both a participant in the research as teacher

and non-participant as researcher, in addition to being a broader community member of the *Gitga'at* people, such an endeavour would have resulted in an incommensurable cognitive dissonance. Thus, in my opinion, an attempt of descriptive phenomenology would have made the results and interpretation of this study disingenuous and fictitious. As such, rather than attempt a futile effort, I embraced the participatory action research element of this study and fully inserted myself. From a [place]-based perspective this is keeping in line with its expressed localism since I was a local both in the broader community and as a teacher within the school.

So, since my chronotope was so embedded within the fabric of this research, should my results, interpretations and conclusions be thrown out as non-objective and skewed? To be blunt, that is for the reader to judge. However, the first three chapters of this thesis are meant to lay bare all my preconceived methodology, notions and philosophies. The subsequent chapters will outlay the raw data collected and my interpretation and conclusions. Thus the reader could use the previous chapters as a bracketing tool to interpret the raw data given in the Appendix and consider if they come to the same interpretations and conclusions I have.

Chapter 4.

Survey Results and Qualitative Support

4.1. Introduction

In the previous chapter I described the structure of the results of the quantitative surveys and qualitative data along with how both data sets were collected. This chapter will begin presentation of the results along with a limited discussion which will be expanded upon in Chapters 5 and 6. While the statistical data gives us a window, the qualitative data gives us the frame and structure to view through that window. In this study, due to the small number of participants, the qualitative data represents the most significant part of understanding the learning environment and its effect on the participants. The quantitative data in here will be contextualized with my commentary in addition to structuring it with qualitative responses. The raw categorized qualitative data can be referenced in *Appendix A* along with the raw quantitative data in Appendix B. In Chapter 6.1 and 6.2 I will discuss and analyze the results of the specific data sets, along with relating these to specific research questions.

4.2. PLACES Survey and Relevant Qualitative Data

The following discussion is based on the PLACES Survey and oral interviews that followed. As stated previously the PLACES Survey was administered twice with a separation of about 3 months in order for students to be able to more independently assess their “Actual Learning Environment” as separate from their “Preferred Learning Environment”. A student’s Preferred Learning Environment is what they desire it to be; questions are characterized by having the phrase “I want” or “It would be” or another

phrase which denotes desire. The Actual Learning Environment form is what the current learning environment is perceived to be like; questions are characterized by being written in present tense. Both the actual and preferred are then compared and contrasted. The Preferred form was taken first and the Actual form taken second. The subsequent interviews were taken after the surveys and the questions were structured to reflect the survey results. The PLACES Survey had some interesting variance and resulted in informative interviews. The Likert scale was as follows: 1 = Always; 2 = Sometimes Always; 3 = Sometimes; 4 = Sometimes Never; 5 = Never. I have included the mean responses for each of the questions in the surveys.

4.2.1. Relevance and Integration

The idea behind the Relevance and Integration category is to assess the students' perceptions of how the Learning Environment is relevant and integrated into their ecology which encompasses their physical surrounding environment and community.

Table 4.1. Relevance and Integration: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{I want to / I} learn about my local environment.	2.875	2.714
2	{I want my / My} new learning to start with ideas important to the local environment.	3.625	3.000
3	{I want to / I} gain a better understanding of the environment and places outside of school.	2.750	2.285
4	{I want to / I} learn interesting things about the environment outside of school.	2.500	1.714
5	{I want my lessons to be / Lessons are} supported with field experiences and other field-based activities.	2.500	2.857

The Relevance and Integration portion of the survey did reveal that their actual learning environment exceeded their preferred learning environment within regards to integration; moreover, the Standard Deviation got tighter as well, suggesting that the students who might have chosen a 4 or 5 during their Preferred survey moved closer to a 2 or 3. This shift is corroborated by the oral interviews conducted after administration of the surveys:

> Student 1: Yeah I liked the beach seining. Hiking to mossy bay was cool too. It's kinda like … sorta like our ancestors I guess … learning in Mossy Bay. Our environment is important because we get our food from out there and so we kinda need it.
>
> Student 2: It's better to see the plants and learn about them from an elder.
>
> Student 3: [I'm most engaged] when we're with elders and learning from them.
>
> Student 4: [I'd rather learn] out in Mossy Bay.
>
> Student 5: Our culture is important cause we are from here and like we need to know so we don't go run off being white. I think I learn better when we are out there learning and not in school with the book because its fun [out there] and when something is fun we want to do more of it.

The desire to have the curriculum be relevant was essentially unanimous. One student presented an interesting comparison to the more traditional school environment of Prince Rupert Middle School (PRMS) from where one student had just recently come. Below the student is discussing his/her learning in a more experiential and [Place]-Based way vs the traditional schooling model s/he had just experienced at PRMS:

> Student: Well actually … um [field learning in Mossy Bay] was a new thing for me. Like in my school there [Prince Rupert Middle School] they would give you a book and say ok your going to be …. ok we're going to be doing this there and they give you a textbook, but when we went out [to Mossy Bay] I'm like, "this is something new". I remembered it more than just a textbook. I like doing the field [work] there, where like you get really into it there.

Yet, since there was a fairly firm unanimous consensus the question arises: Why did students not all choose "always" or "1" for their preferred learning environment?

Interestingly students were pragmatic. The way one student put it, *"Both. I like to learn about here and other places"*. Students felt that they also want to learn about other histories, places, environments and ecologies other than their own; however, they also agreed that they would rather it to be taught in a way which connects it back to their place, culture, history and ecology.

4.2.2. Critical Voice and Shared Control

Both Critical Voice and Shared Control should be discussed at the same time as they are two sides of the same coin in many ways. Critical Voice relates to the capacity for a student to state their opinion and participate in the structure and design of the course. It is here that this study attempts to understand the collective perception of how their learning environment facilitates their involvement. The statements/questions were as follows:

Table 4.2. Critical Voice: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{It would be / It's} all right for me to ask the teacher "why are we learning this?"	2.125	2.285
2	{It would be / It's} all right for me to ask for a better explanation of learning activities when I need one.	3.125	2.714
3	{It would be / It's} all right for me to request fewer interruptions that interfere with my learning.	2.750	3.000
4	{It would be / It's} all right for me to express my opinion.	2.500	2.857
5	{It would be / It's} ok for me to speak up for my rights.	2.625	3.428

Shared Control relates to the capacity of a student to suggest activities and control the curriculum. The "Preferred" question also hinted at the desire itself to participate in a Shared Control regime while the "Actual" questions consider the current state of the learning environment as perceived by the students. The statements/questions were as follows:

Table 4.3. Shared Control: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{I want to / I} help the teacher plan what I'm to learn.	3.000	4.285
2	{I want to / I} help the teacher to decide how well I am learning.	3.125	3.857
3	{I want to / I} help the teacher decide which activities or projects are best for me to work on.	2.625	3.571
4	{I want to / I} help the teacher decide how much time I spend on learning activities.	3.000	4.428
5	{I want to / I} help the teacher decide the activities I do.	3.125	3.571

As the data suggests, students' perceptions of the learning environment remained practically the same with the scale of Critical Voice yet dramatically shifted with that of Shared Control. On the surface this seems a bit contradictory and so this was a primary consideration for the final oral interviews. My goal was to figure out why students felt that they had a Critical Voice but not much Shared Control.

One interesting idea from a student was that, while they might have wanted to do/learn a project, when they did do that project, it did not meet expectations: *"maybe because we thought it would have been fun and then when we actually did it we thought it wasn't fun"*. Some of this variance might have to do with something as simple as maturity. As one student articulated, *"I don't want any teacher control. I want to have more control than you in the classroom"*. While this student was in the minority, it also

expresses how teaching throughout the grade spectrum from K-12 is essentially a gradual progression of releasing control when students become mature enough to assume control. I know from my own practice that I give more control and freedom to Grade 11/12 students than I do to Grade 6/7 students. Aside from that one student who wanted all control, most other students intuitively saw the need for mutual control with comments like, *"Ahhh … 50/50 … I want to say 'this is what we are learning about' and then you telling us how we are learning about it"*. Another student said that s/he think that Shared Control *"has been a positive thing for us"* but that s/he only wants it *"50/50"*. When asked about having a Critical Voice another student said, *"sometimes … most of the time yeah … but sometimes no … its good to have the teacher"*. Another student felt *"pretty good about sharing [their] ideas about what [they] should do and all"*. While most students were in the middle, one student was on the other side of the spectrum. When asked about Critical Voice and Shared Control the student replied, *"I'm like 'NO'. I want you to like [direct us]."*

Interestingly, students were more able to present times when they did have shared control than when they didn't. The following student typified the answers given when asked what they had control over: *"when we made the dedication video for the graduates, the sour video … um … the camping experience … and … there is also the volcanoes …"*.

4.2.3. Open Endedness

Through the scale of Open Endedness students have the capacity to reflect on the design and structure their own learning. This survey also attempts to understand the desire for Open Endedness within the student. The statements/questions were as follows:

Table 4.4. Open Endedness: Collective Answer Means

Statement / Question	Preferred	Actual

1	{I want to be / I am} able to go beyond regular learning activities and do some study on my own.	3.375	3.714
2	{I want to be / I am} encouraged to think for myself.	2.000	3.285
3	{I want / There are} opportunities to pursue my interests.	2.875	3.142
4	{I want to / I can} design my own learning projects.	2.500	3.714
5	{I want to be / I am} able to express myself freely in my learning.	3.000	3.428

The scale of Open Endedness falls in line with much of what was discussed with Shared Control. In my Teaching Journal I noted that this category divided between "higher" performing students vs. "lower" performing students. During the oral interviews students whose grades were in the upper third of the class expressed much more interest in Open Endedness than students who were in the lower two thirds. A comment from one student that generally expresses the attitudes of the two thirds said, *"I would probably do nothing"* when presented with a lot of Open Endedness. Another student indicated that they don't want openness and negotiation but rather *"structure and an outline"* because its *"easier"* and if it was Open Ended *"I wouldn't do nothin' [sic]"*. Likewise, a student said s/he like the teacher *"to give the work"* otherwise *"yeah … I'd probably not do much"*.

4.2.4. Group Cohesiveness

The Group Cohesiveness scale focuses on student social dynamics and how they perceive themselves as either helping each other or being unsupportive of each other. The statements/questions were as follows:

Table 4.5. Group Cohesiveness: Collective Answer Means

	Statement / Question	Preferred	Actual

1	{I want students to / Students} get along well as a group.	2.125	2.714
2	{I want to build / I have built} better relationships with other students.	2.750	2.714
3	I want students in this class to support each other and to develop a stronger community dialogue. / I feel students in this class have supported each other and have developed a stronger community dialogue.	2.250	2.571
4	{I want students to / Students have gotten} to know each other well through participating in activities.	2.750	2.285
5	{I want to be / I am} able to depend on others for help during classroom activities.	2.250	2.420

Group Cohesiveness is an interesting category for a remote community like Hartley Bay whose population in general are "family" and everyone knows everyone. Judging from the survey data students are exactly where they want to be. That is to say they mostly want a cohesive group but also respect a level of independence and individuality. In the interview process student responses generally reflected their survey responses. Students felt that technology in general had allowed them to increase their inter-student cohesion. Yet, there were divisions in the group. One student said, *"I work best in the group … well it depends on who we are working with"*. Some of this again came down to maturity level with one male student claiming he only likes working with boys: *"I would only help like two people. Only those two people are boys. So it would be three people if [student name] was still here. I don't really talk to them [female students]"*.

Hartley Bay presents a unique social environment in general. Unlike most schools where student relationships and family relationships are generally separate social environments, in a remote village school where everyone is, to a greater or lesser extent, relatives, these relationships intermingle and intertwine into an entirely different social dimension. Issues between families or students spill into both the classroom and

community social sphere. One student articulated how this can manifest itself in the classroom:

> Student: Like when you put us into groups of four [names students] and then [two specific students] won't talk to each other [because they] don't like each other. Because they don't really work and they don't really talk and when we put them together and try to make them try work they don't really do anything.

These dynamics were always fluid in the classroom. One week two students would be mortal enemies while the next they would be "BFFs". There was never a line between the outside community and inside the classroom; moreover, there were times when parents between families would be angry with each other and this also could create tension.

Yet, as anyone who has lived in a family knows, families fight. However, family is always family. While there were always various fluid social dynamics, the students in general, from my experience and teacher notes, always worked towards helping each other. Despite differences, in the end, they are all *Gitga'at*.

4.2.5. Student Involvement

The scale of Student Involvement measures how engaged students are in the class, the curriculum and the learning environment taking place. It probes how involved the students want to be within the course. The statements/questions were as follows:

Table 4.6. Student Involvement: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{I want the teacher to / The Teacher} ask(s) me questions when we are learning.	3.625	2.714
2	{I want to / I} ask the teacher questions when we are learning.	3.000	2.571

3	{I want my / My} ideas and suggestions to be used during discussions.	3.375	3.142
4	{I would want to / I} pay attention.	3.000	2.714
5	{I want to / I} offer my opinions during discussions.	2.875	3.571

It is interesting to note that Student Involvement was the only other category aside from Relevance/Integration to show a definable uptick from never to always. This suggests that student's actual involvement exceeded their expected or desired involvement.

The interviews revealed that, without a doubt, students felt most engaged when they were doing field work in some capacity. This was reiterated time and again:

> Student 1: I feel more connected to my learning outside or using my hands.
>
> Student 2: I was most engaged with stuff like the making the Volcanoes and Mossy Bay.
>
> Student 3: [I'm most engaged] when we're with elders and learning from them.
>
> Student 4: [I'd rather learn] out in Mossy Bay.
>
> Student 5: I think I learn better when we are out there learning and not in school with the book because its fun [out there] and when something is fun we want to do more of it.
>
> Student 6: [I learn best] mostly when we are outside.

This was also reflected in the capacity to retain learning. During the interview a student got excited about naming the fish that s/he learning about during the beach seining: "*Pipe fish … they looked like grass and um … bull heads and um … there was ahhh eels and ahhh …. there's those little chum …"*. My Teaching Journal also reflected this clear engagement in the [placed]-based learning environment from the students during those times. Moreover, students were able to move from surface learning to a deeper learning. During an interview when a student was asked about flounder and why they might look

the way they do s/he responded: *"Flat sand … their bottom looks white and the top looks sand [sic] … um … so it could hide itself"*.

Another area where I noted a significant level of engagement in relationship to other types of learning environments was with hands on and generative technological learning environments. While not mentioned as much as the [place]-based learning environment, it was clear in my notes that when students were given an opportunity to use technology in a creative and generative way, class management issues and inter-student strife went noticeably down. Moreover, student learning moved from surface-learning towards deep-learning as students unknowingly began to direct their own learning through a natural desire to accomplish something in a creative way.

4.2.6. Student Negotiation

The scale of Student Negotiation encompasses the capacity to negotiate activities between students and in groups. A strong component of this is the ability to ask each other questions and support each other through the curriculum. The statements/questions were as follows:

Table 4.7. Student Negotiation: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{I want to be / I am} provided with opportunities to talk with other students about how to solve problems.	2.750	2.714
2	{I want to / I} make an effort to explain my ideas to other students.	3.125	3.285
3	{I want to / I} ask other students to explain their ideas and opinions.	3.000	2.174
4	{I want / Other} students to ask me to explain my ideas.	4.125	3.428

5	{I want other / Other} students {to be / are} provided with opportunities to explain their ideas to me.	3.000	3.571

A strong component of Student Negotiation is the ability to ask each other questions and support each other through the curriculum. Out of the categories which focused on student social dynamics, this category scored the furthest into the "never" territory. Student negotiation was not a top priority for students and the actual learning environment reflected their preferred learning environment.

Some of these dynamics were already discussed during Group Cohesiveness and will also be discussed during the data review on Website Usage. Students' negotiation in part tended to be influenced by the social dynamics outside the classroom in the community. As discussed previously sometimes strife between families would affect student interaction within the classroom. Another factor, which will be discussed during the Website Usage portion, was how students desired the ability see and discuss other student's work but were resistant to showing or discussing their own work. This created a Catch-22 scenario. Overall students did seem to have a derogatory view of student interaction and negotiation. As one student put it:

> Student: Yeah … we are not really good at sharing. I don't know … people don't share with me and I don't share with them. I don't share with them and they don't share with me.

While this is a more extreme view of the pessimism present within the social dynamics, it does represent a general pessimism present within the classroom.

4.2.7. Environmental Interaction

The Environmental Interaction scale focuses on the engagement of students in field based experiences. It also seeks to understand how students want field trips or experiential education to function. The statements/questions were as follows:

Table 4.8 Environmental Interaction: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{I want to be / I am} more engaged during field trips.	2.375	2.428
2	{I want to be / I am} able to express myself freely during field experiences.	3.375	3.000
3	{I want learning which / Learning} is important for me during our field experiences.	3.000	3.000
4	{I want to / I} put a lot of effort into the learning activities during our field trips.	3.000	2.857
5	{I want to / I} spend most of the time during field local trips learning about my environment.	2.50	3.000

This category focuses on the engagement of students in field based experiences. While the survey results point to an overall “sometimes” engagement perception of their field experiences, both the interview data and my Teaching Journal noted that students were much more engaged in field/community experiences than any other learning environment. The student interview data on this was already extensively considered in the Student Involvement portion of this data analysis. However, I will add that my notes and observations indicate that students were most engaged in field/community learning environments when they integrated creative technological tools like video, photography and audio. When students could not only experience their learning but also document it, and creatively construct it, their engagement increased and learning deepened. This is a great example of how [Place]-Based and Technological Learning Environments can be intermingled into a co-generative learning processes; moreover, it exemplifies how both learning environments can support and feed into the other.

On the next page is a graph which visually shows the overall means for each category of the preferred and actual surveys. Additionally the Standard Deviations are also graphed.

PLACES Survey Results Preferred and Actual

	Relevance/Integration	Critical Voice	Student Negotiation	Group Cohesivness	Student Involvment	Shared Control	Open Endedness	Environmental Interaction
Mean - PF	2.85	2.625	3.2	2.425	3.175	2.975	2.75	2.9
σ - PF	1.188621266	1.294713115	1.017790468	1.195879678	1.034965626	1.165475582	0.980580676	1.081309747
Mean - AC	2.514	2.857	3.1428	2.54285	2.9428	3.9428	3.4571	2.8571
σ - AC	0.781078763	0.974463869	1.061155229	1.038745203	0.968408553	1.10992467	0.816839575	0.87926631
p-value	0.148435063	0.379922699	0.406620794	0.32460331	0.159606413	0.00022244	0.000537827	0.425238606

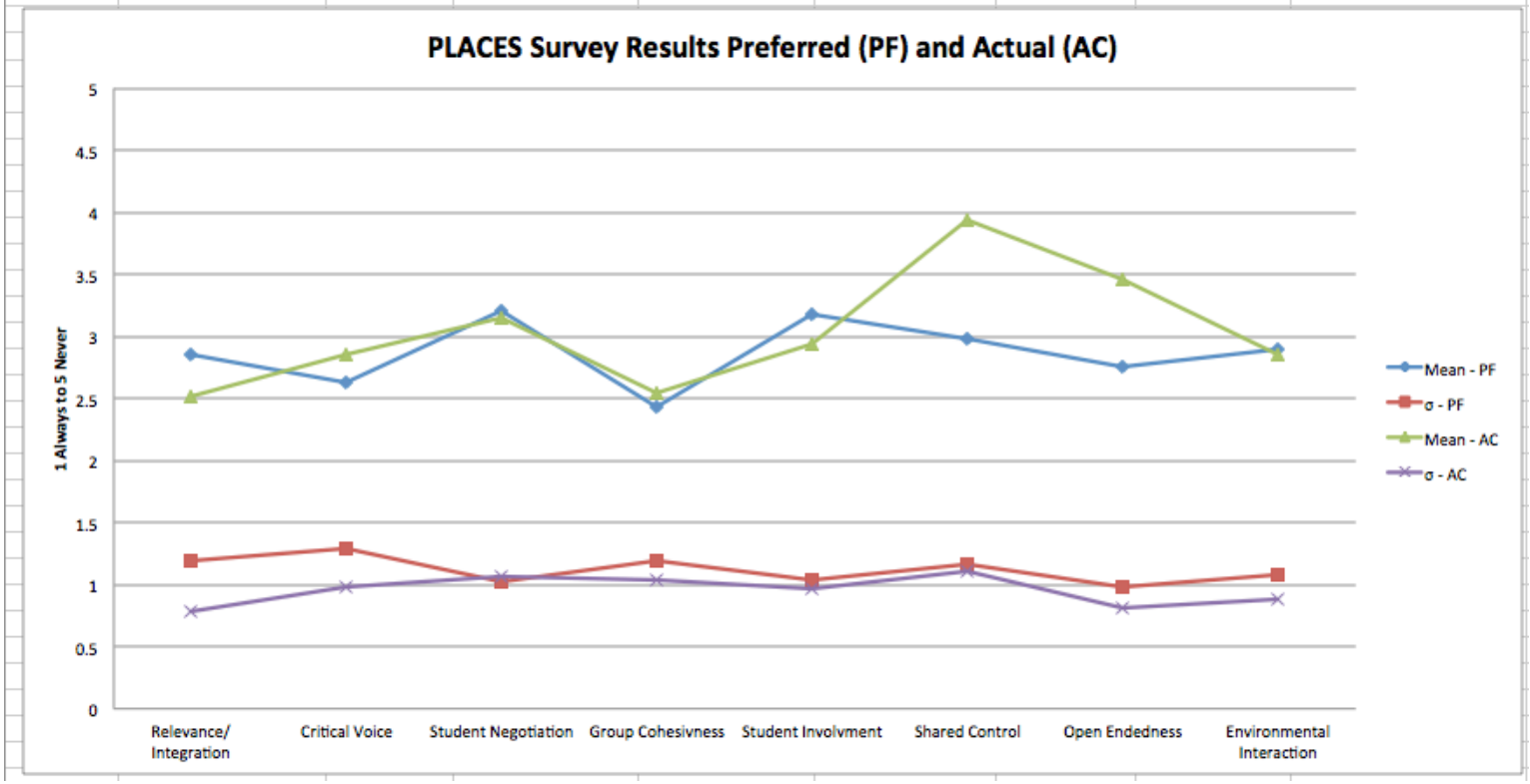


Figure 4. Graph of Category Means and Standard Deviation of PLACES Survey

4.3. Technology and Culture Survey and Relevant Qualitative Data

Overall the data for these surveys remained relatively consistent over the two survey cycles. That said there are some interesting divergent points to discuss. Holistically students appear to feel in the "sometimes" to "sometimes-always" range. The results for the "Actual" classroom experience for the first four categories of the Technology and Culture Survey got a bit closer to "always" while their Standard Deviations got a bit tighter. This does suggest that perceptions of the learning environment shifted towards desiring technological learning environments more. The questions about Indigenous Culture, Place and Technology remained almost perfectly consistent. Below I will be going over each category individually, however, some of the data will be discussed in Chapter 5 which focuses on *Mahara* and LMS directly and thus this chapter will only briefly touch some topics in an effort to avoid too much repetition; moreover, there is a more in depth look at qualitative data in relation to *Mahara*/LMS and the website in Chapter 5.

4.3.1. Emancipatory Activities

Table 4.9. Emancipatory Activities: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{I want to be / I have been} able to access my school work from anywhere.	3.000	2.571
2	{I want an easy way / It has been easier} to show my parents/relatives/guardians what I am doing at school.	3.125	2.571
3	{I would like to not have to / I have not had to} carry school materials to and from school.	2.875	3.000
4	{I would like to have / I have liked} more content online so I	3.125	2.572

	do not lose my materials.		
5	{It would be great to have / I have liked having} a place which clearly outlines what I am supposed to do for the class.	2.375	3.000

Emancipatory Activities are defined as activities which provide: Convenience, Efficiency, and Autonomy (Chang & Fisher, 2003, p. 9). Within this study and its context, this relates to the capacity for students to access their school work from anywhere and ease of creating and submitting work. While this will be discussed more in depth in Chapter 5, students did feel that *Mahara* provided them with an emancipatory capacity to travel to Rupert, or be home sick, but still participate in the school work. However, this was still seen as a double edged sword with comments like*, "cause I might go crazy if I always had access to my homework"*. This somewhat love hate relationship with the idea of "emancipation" is reflected in the "sometimes" qualification. The irony of freedom is that it comes with responsibility which can initially be harder to deal with than the constrictions a person is used to. This is reflected in the survey and interview responses. Students knew intuitively that such an emancipatory system is "good" for them but they did not want to deal with the responsibility of going to Prince Rupert and still having access to the materials because they can't conveniently "forget" them.

4.3.2. Co-Participatory Activities

Table 4.10. Co-Participatory Activities: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{I would like / I like having} a place to reflect on the work I have done.	2.750	3.00
2	I feel that being able to see other students work {would / has} help my work.	3.125	2.714
3	I think having other students give me comments and view	3.500	2.857

	my work {would / has} help me perform better.		
4	I think it {would be / has been} easier for me to comment on a student's work, and course content, online rather than face to face on in class.	2.625	2.571
5	I {would like / like to} a place where all students could show their work and participate in discussion.	3.250	2.571

Co-Participatory Activities are those activities which promote reflection, interaction, feedback and collaboration. Students in this class were all over the map in their interviews on this topic. Some students liked the idea of reflection, *"I'd want to see it … just see all the work I've done in the past"*, while other students were almost revolted by the idea, *"I don't like looking back at my work once it is in the past. I don't want to see it again. It disgusts me."* When the student was asked to explain this further s/he responded *"because I hate doing work … work is the worst"*. Most of the students didn't like the idea of other students looking at their work, *"I don't really like other people looking at my work … except for the teacher though"* but there were a couple who liked the idea, *"Yeah I think it would be good just to show each other how hard we have been working"*. Interestingly though all the students liked the idea of looking at other student's work: *"Yes. It would be a benefit."*

4.3.3. Student Benefits

Table 4.11. Student Benefits: Collective Answer Means

	Statement / Question	Preferred	Actual
1	I {would like / like having} a place where our class can be supportive each other.	2.625	2.714
2	I believe an online and computer environment {would help / helps} me perform better than a paper environment.	2.750	2.714

3	I think a web-based and computer learning environment {would hold / holds} my attention better than a pen and paper learning environment.	3.250	2.857
4	I think I {would be / am} less bored in class, and doing homework, if I could do it on a computer based system.	3.125	2.571
5	{I want an / The} online computer based environment which is easy to use.	2.875	2.571

The scale Student Benefits seeks to understand how the student perceives the benefit of a web-based learning environment. How a student perceives their learning environment naturally affects their performance within it. The students did express through the interviews that their learning experience increased once they became more familiar with the technology. One student characterized their class experience and technology as such: *"I think our … I think it's gone up."* This was in part due to the learning curve but now *"yeah … it's better"*. Another student commented, *"I think the website [Mahara] has been a positive experience"*. The student further indicated that it was easier to do assignments with *Mahara*. The interview data supports what the survey data suggests, which is that students' technological learning environment got better as the technology became more familiar. Students began to manipulate their technological learning environment in a personal way thereby moving from simplistic constructions to more complex developments which enhance ones interaction and development of learning.

4.3.4. Information Structures and Design Activities

Table 4.12. Information Structures and Design Activities: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{I want the / The} learning objectives of each lesson clearly stated and accessible.	3.125	2.857

2	{I want / The} learning resources easily accessible and clearly connected to the learning objectives.	2.750	3.000
3	{I would like / I believe the} multimedia content which enhances the learning environment.	3.250	2.571
4	{I would like / The} expectations of assignments to be clearly stated in a web-based environment.	2.750	3.000
5	{I want / I feel the} classroom activities to be easily put into the web-based computer portion of the class environment.	3.000	2.571

The web-based learning environment is only a tool. All tools can be used effectively or ineffectively. How those tools are designed, organized and implemented is important. This category is meant to understand if these tools perform in the way they were intended. The response on this was generally mediocre. Students did find the online learning environment clunky and not entirely intuitive; moreover, they saw *Mahara* as a bit constraining. Also, *Mahara* is not mobile friendly and many of the kids have easy access to phones or tablets but limited computer access.

4.3.5. Indigenous Culture

Table 4.13. Indigenous Culture: Collective Answer Means

	Statement / Question	Preferred	Actual
1	{I want my / My} traditional culture reflected in all the subjects I learn.	3.000	2.714
2	{I want my / My} classroom activities to help create and build my traditional culture.	2.750	2.428
3	{I want to learn / Learning} ways to use technology {to help / has helped} build and strengthen my cultural heritage.	2.250	2.571

4	{I think learning / Learning} about other cultures {will help / has helped} me understand my culture better.	2.625	2.857
5	I consider popular culture from Hollywood to also be part of my culture.	3.000	3.571

It is important for students to feel culturally connected and generative. The *Gitga'at* have a long and vibrant cultural history. These questions are intended to understand how students perceive Place-Based and Technological learning environments in relation to their traditional and developing cultural traditions. Student's expressed both in the survey results and in the interviews that technology is a double edged sword. Many of the students felt that technology was bad for their culture because it promoted a monoculture, diminished local cultural engagement and sedated people. When asked about technology as benefiting indigenous culture one student responded with:

> Student: No I don't see that because like um … the whole point of [Kiel[1]] is to go there for like um seaweed picking and other hunting there but if we have Wi-Fi and that there no one is probably going to go up. No one is probably going to stay .. They are going to stay in[side] maybe … watch TV … maybe go on Facebook, YouTube. So like maybe like … I don't really want really Wi-Fi but it is helpful sometimes to see what this … like … mine is a positive slash negative. It's like we can go on to the um … Google there and search out this plant there that we don't know of and see if its like poisonous or is it fine or we can like see how we can get rid of animals that are like 10 feet away from you.

This student's conflicted ramble exemplifies the love hate relationship with technology that students have. Another student express similar feelings when s/he said, *"Technology is great but it is not really good cause most kids play on their iPads and stuff yet they need to be playing outside. They should be playing it on a rainy day or windy or when there is thunder and lightning"*. Another student indicated that *"you pay*

[1] Kiel is a seasonal harvesting village. It is about a 45min boat ride southwest of Hartley Bay primarily used in May during the Seaweed and Halibut harvest.

more attention to the technology than our culture sometimes" and that they are at risk of *"forgetting the culture"*. The students live in a cultural contradiction where they aggressively consume the Anglo-American-Euro monoculture on the one hand yet lament its effects on the other; moreover, their traditional culture becomes more of a performance rather than a generative and creative participation. As much as they might try, the glitter and intoxication of western-euro-capitalist culture makes their present place and existence seem mundane by comparison.

Yet while students lamented technology as the cultural killer, they also realized its potential as the cultural creator. When students became empowered by technology their attitudes changed. When asked about recording elders and promoting their culture through digital media a student responded, *"it's supporting so then like you can keep it there and like show people how the culture is and like … why its so important to these people"*. Another student felt that, *"when I have kids and just make sure they know all about this place"* through digital media. Students also felt that technology could help them interact with their culture better by utilizing the tools and doing things like *"recording the elders"*. Most of the students felt that our use of technology[2] in the class was of a net benefit and allowed them to understand their culture and [place] better; moreover, many students felt that *"Yes. I think I can express myself better"* with technology. Within this class students realized that they don't have to just use technology as a vessel for cultural consumption but that they could use it as a tool for cultural creation as well. This was certainly a positive shift in perspective from my viewpoint.

4.3.6. [Place] and Technology

Table 4.14. [Place] and Technology: Collective Answer Means

Statement / Question	Preferred	Actual

[2] Which in this case encompasses all technological tools (video cameras, audio recorders, salinity/temperature monitors, etc.)

1	Being able to digitally post what I learn about my local environment {will help / has helped} me understand it better.	3.000	2.571
2	Using cameras, video and audio, {I will be better able / has helped me} to make sense of the place I live.	2.125	2.857
3	Having an environment where I can communicate to the world about the place I live is important to me.	2.500	2.571
4	Part of appreciating the place I live in is being able to make creative responses to it.	2.875	3.142
5	Using technology to do research about the place I live {could be / is} beneficial.	2.750	2.714

The intersection of developing and integrating two learning environments effectively is a significant concern of this study. This category is built to understanding how students perceive this intersection. Overall students felt that these two learning environments, when used appropriately, worked well much of the time. One student articulated it this way:

> Student: I think they work pretty well together so then we can experience [our learning] but like … um … I wouldn't mind doing it the traditional way because the electronics kind of take over a bit but I didn't mind taking pictures like video taping it and measuring and checking the water out.

Overall this was the general consensus of the students across the interviews. They felt that technology serves both as a benefit and as a hindrance. [Place] and technology can be used together effectively but it needs to be a healthy balance. This will be discussed in more depth in Chapter 5.

On the next page is a graph which visually shows the overall means for each category of the preferred and actual surveys. Additionally the Standard Deviations are also graphed.

Technology and Culture Survey						
	Emancipatory Activities	Co-Participatory Activities	Student Benefits	Information Structures and Design Activities	Indigenous Culture	Place and Technology
Mean - PF	2.9	3.05	2.925	2.975	2.775	2.65
σ - PF	1.007662947	1.036512892	1.118320627	0.973692417	0.891196257	0.833589704
Mean - AC	2.742	2.742	2.685	2.8	2.828	2.771
σ - AC	0.950011057	0.741336517	0.795998395	0.719476934	0.821967306	0.770244968
p-value	0.244737847	0.070506139	0.142597965	0.187707	0.393687664	0.257126633

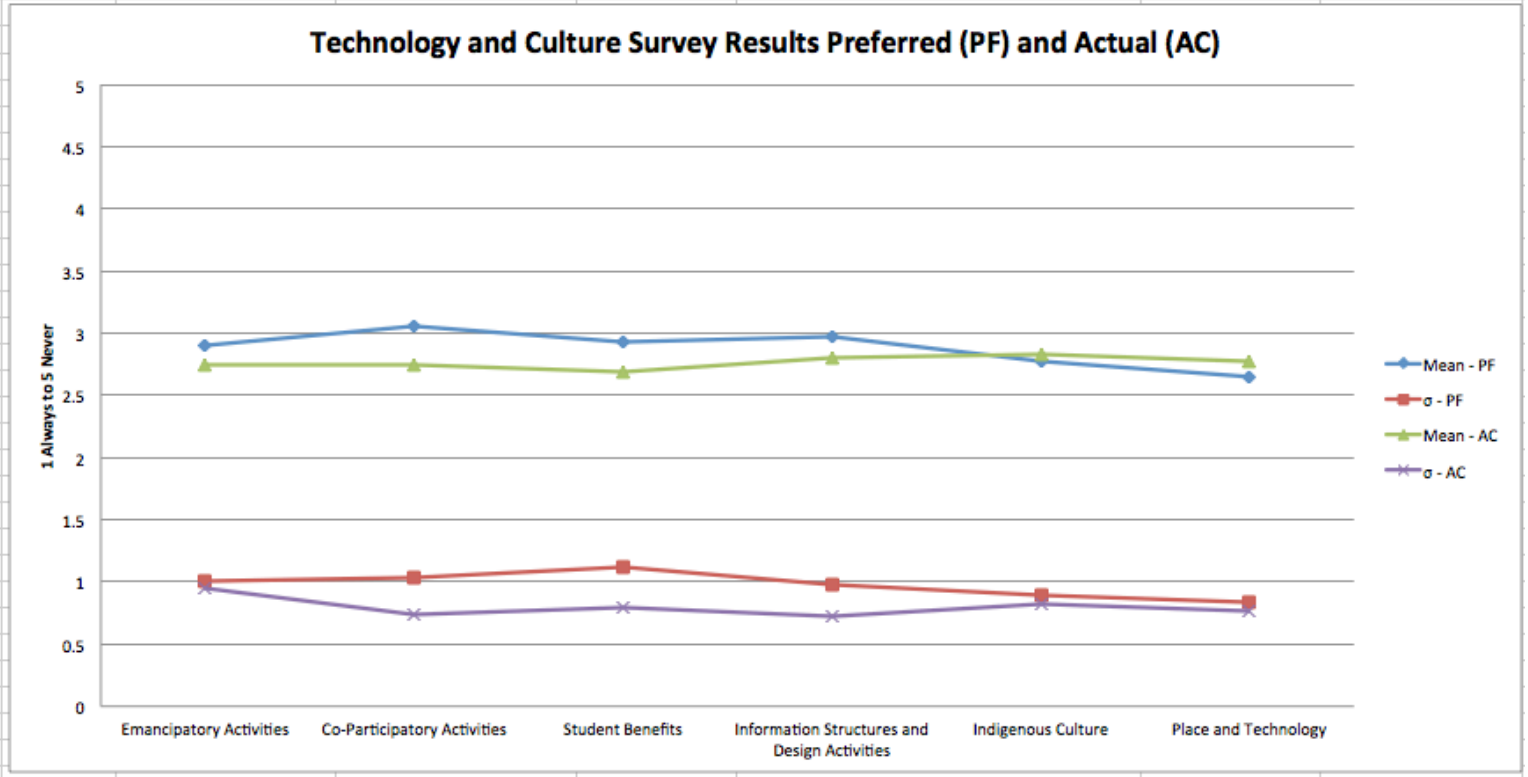


Figure 5. Graph of Category Means and Standard Deviation of Technology and Culture Survey

Chapter 5.

Mahara Website / LMS Secondary Data and Discussion

5.1. Introduction

This chapter will focus its discussion on the *Mahara* website, its usage and some insights gained from its usage. While the most important data for this study is the surveys and subsequent interviews, I feel that an in-depth discussion and analysis of how the website was used will give further insight into the three questions this thesis is concerned about:

1. How do indigenous communities and students perceive learning environments?
2. Does the addition of modern technological tools foster engagement and encouragement within remote indigenous communities?
3. Can intertwining of [place]-based and LMS/technological learning environments incorporate indigenous perspectives and enhance student performance?

In particular with this data we can gain more insight into if students have engaged and if an electronic portfolio based system helps indigenous students both culturally and with their performance in contrast to more traditional learning environments. This chapter will both present the data and give an interpretation at the same time.

It should also be noted while considering this chapter that you will see a lack of "screen shots" or page examples. This is sadly due to a series of unforeseen and unfortunate circumstances. Put briefly, at the end of this study in June (also the end of the school year) my family was moving to start our new life in Prince Rupert. Once I had

finished my final qualitative interviews at the end of June all my attention and focus went into moving my family which is not a simple task when you have lived in a very remote place for 3 years which is boat access only; in addition we had our life spread between Hartley Bay and Vancouver but we were moving to Prince Rupert yet spending the summer in Vancouver. Needless to say I was distracted. At the time I figured I could visit the website later, which was publicly available on the internet. However, over the course of the summer Hartley Bay upgraded their entire internet infrastructure to fibre optics. The upshot of this is that all the IP addresses and Firewall configurations and equipment was changed. As a result the website is no longer available. Furthermore there is no one in Hartley Bay, and in specific Hartley Bay School, who has the technical expertise, or quite frankly the motivation, to get the website up and running again. It has also not been practical for me to travel to Hartley Bay to fix it for a variety of reasons. Put simply, I sadly no longer have access to the Mahara website or the students' work, if it even exists anymore, at this point.

Mahara website usage was monitored in two different ways: *Mahara* Statistics and Google Analytics. The purpose of this was to gain insight into when and how *Mahara* was being used in relationship to pages viewed, content posted, class time use (CT) and after hours use (AH). *Mahara* gives good statistics on cumulative views of specific pages and types of content posted; however, it does not break down website access by time, session duration and number of page views in a given time period. This is where Google Analytics can give a much more nuanced view. Google Analytics collects hourly data and thus you can organize it by CT and AH along with the number of pages viewed each hour, number of users and number of sessions during those specific times. These statistics, along with the qualitative interviews, can help us formulate answers to research question 2 and 3. Finally, to put this data in perspective, the numbers reflect a classroom size of 7 students throughout the study period with an 8th student in the class for only two weeks.

Pages in *Mahara* function under the same definition as pages within the rest of the internet; in other words, a page is a web document that is suitable for the World Wide Web and the web browser; moreover, it is the collection of "pages" which make up

the overall “website”. Pages in *Mahara* are made up of “blocks”, or units of content, which have either artefacts or responses. These blocks can be organized in a variety ways by row, width and number. An example of a student page is presented on the next page:

Science 1.1/1.2

by [redacted]

Ecology and habitat

Some Plants that we saw on our way up.

Abiotic things in this photo<--

- The tiny water fall
- The dirt
- Rocks

Biotic things in this photo<--

- The plants
- the insects

Second photo

The next photo has many Abiotic and Biotic photos.

Abiotic,

- The building behind us
- the atv behind us

Question 6

Q: The light and fluffy seeds of dandelions are spread by the wind. How are the seeds adapted to the dandelion's ecosystem?

A:It's the different kinds of weathers. (Mainly Wind)
The wind lifts up the fluffs and it travels to all different spots and boom! More Dandelions!

Question 5

Q: **Thinking Critically** A home aquarium contains water, an air pump, a light, algae, a goldfish, and algae-eating snails. What are the Abiotic parts of this environment? Which parts would you consider to be a community?

A: The Abiotic parts are, air pump, and a light, and the water, the glass, and the rocks.
The part I would consider a community is, Everything that interacts with that system.
The population is Goldfish, Snails, and Algae

Figure 6. Example of *Mahara* Student Page

As you can see there are three rows with even width and 6 blocks (1 on the left, 3 in the middle and 2 on the right).

The number of pages created and the number of views those pages got can reveal the extent to which the students engaged and interacted with *Mahara*. It should be noted that *Mahara* calculates views by omitting views or edits from the creator of the page. Thus views represent visits from someone other than the creator; moreover, none of these pages were viewable by anyone outside the class so the views represent only student interactions.

5.2. Cumulative Page Views and Artefacts

The students created 196 unique pages, that averages out to 28 pages per student overall, and roughly 5 pages a month per student (January to June), for a 7 student class. Disregarding content or quality of the pages, this reveals that the students had a sustained interaction with *Mahara* and created, on average, one page a week. From a content perspective these pages did vary in terms of time and effort put in. Some were filled with artefacts and responses while others were just simple responses to field experiences or assignments. However, all the pages showed a level of commitment and engagement by the students and to their own abilities. A point should be made on evaluative judgments here. There were situations where one student might have added video and composed photography along with an articulate paragraph response while another student might have just put a few photos and sentence responses; from the perspective of this study both of these students had the same level of engagement and interaction with *Mahara* despite the level of content produced. This study assumes an equal stance by evaluating content produced relative to student ability and commitment. This is particularly pertinent in multi-grade classrooms such as my grade 6-8 class but was also certainly considered between students in the same grade.

To give an example, I had three students in my grade eight class. They were given an assignment to take a traditional story told to them by either their

parent/aunt/uncle/grandparent and retell in their own way by writing it down[1] and pictorializing it. Student A, wrote 5 paragraphs with multiple revisions, drew a couple of pictures which the student scanned and then Photoshoped, and even went so far as to include an audio recording of her granny telling a version of the story. Student B managed to write a single paragraph and included a couple pictures downloaded from the internet. Despite significantly different results both students pushed themselves and accomplished new academic and social achievements. Moreover, despite Student B being outside the particular parameters of the assignment (they were suppose to draw their own pictures and write multiple paragraphs), I still gave that student a passing grade because, relative to where s/he started, s/he had displayed academic, social and cultural development. Thus, as you can see, my evaluative process was very personalized to the student. The students themselves in many ways drove the evaluative process as I responded to their needs rather than providing formulaic and rigid evaluative procedures. I should note that this way of evaluating is much easier to do in a small intimate class setting and when you have been teaching the same students for three years. My evaluative procedures in the Delta School District with multiple 30 student classes were much less personalized and very formulaic.

From this evaluative context the content produced on those 196 pages varied from moderate to excellent. The variance itself was directly correlated to an assignments engagement and relevance with the student. If the student was "into" the assignment they would put much more time and effort relative to their abilities. As such, I would argue that level of content itself cannot be considered a direct indicator of *Mahara*'s effect on the learning environment; moreover, given this, since students produced excellent work relative to their engagement with the assignments, *Mahara* can be seen as, at this point, either a neutral medium of expressing learning to a positive medium.

In order to delve more into *Mahara*'s neutral or positive effect, it benefits us to consider pages viewed. On the next page is a graph which outlines the main viewing categories:

[1] It should be noted that students were told to ask permission from the story teller before writing the story down.

Cumulative Views Per Category	
Profile Pages	1400
Student Content Pages	723
Assignment Explanation	223

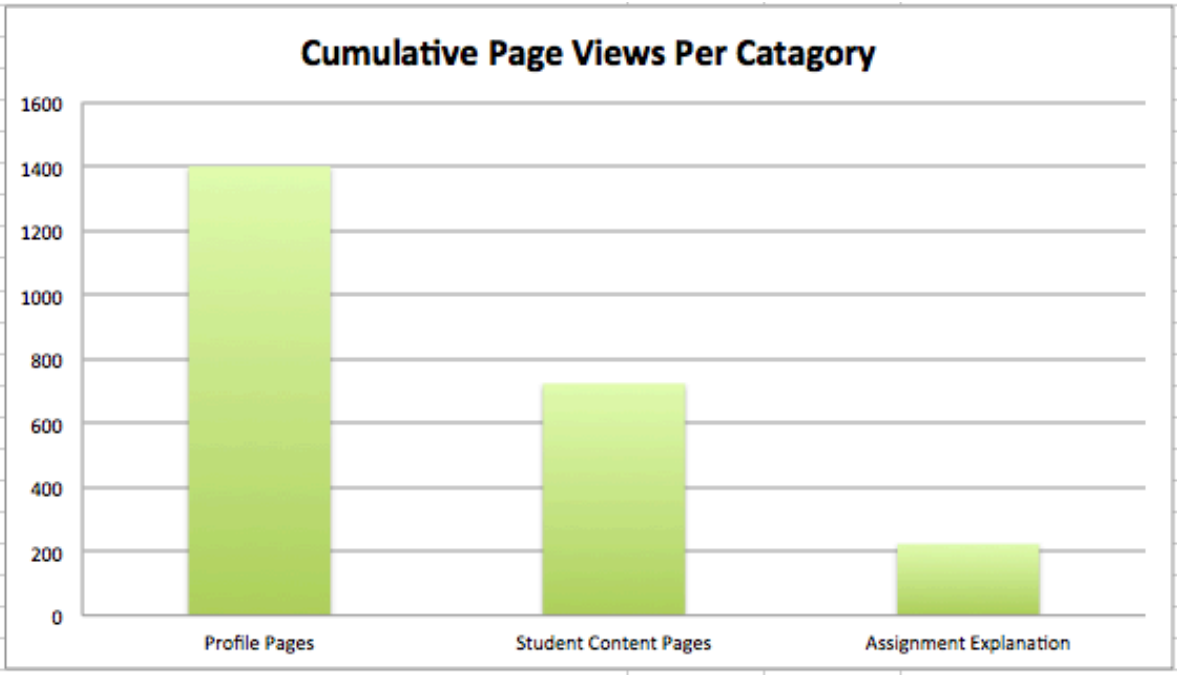


Figure 7. Graph: *Mahara* Cumulative Page Views

The Profile Page was, without a doubt, the most popular with cumulative views at 1400 over 8 pages; that is 200 views per student and about 33 views a month per student on average (January to June). Profiles are pages students designed about themselves and who they are. Students were able to add artefacts (pictures, sound, video, etc) and responses. This exceptional engagement reveals that, from a inter-student social perspective, *Mahara* had a significant effect; moreover, my journal entries note that students loved to view each other's profiles, became "friends", and continually updated their profiles. This reveals that creating a casual online social environment can have a positive effect on student interaction.

Student content pages received just over half as many views, 723, as the Profile Pages. Student content pages are those pages that students created to express their learning and ideas. One reason why the views might be significantly lower than Profile Pages was that students were only required to make a couple of selected pages "viewable" by other students; furthermore, during the oral interviews most students expressed reservations about having other students view and comment on their work:

> Student 1: I don't like explaining my ideas to other students.
>
> Student 2: Shyness. I get really shy.
>
> Student 3: Sometimes yes [I get anxiety]. I'm afraid of being wrong.
>
> Student 4: I'd want to speak your [sic] mind but I wouldn't want to get judged for doing that … sometimes I feel judged I guess.
>
> Student 5: I feel nervous that they are not going to like my idea.

Another two students felt a bit more positive about sharing with one student commenting *"Yes. I like doing that."* when asked if s/he enjoyed discussing their ideas with other students; the other student said that s/he didn't totally like the idea of students looking at his/her work but that it was "probably good" for them. Moreover, and somewhat paradoxically, most of the students said they enjoyed looking at other student's work and found it helpful in their own work. I found this point particularly interesting in that while students disliked the idea of presenting their work they liked the idea of seeing other student's work.

From a pages viewed and expression of learning perspective the students were engaged and productive with this tool. The Google Analytics data in the next section will extend and support this idea. Moreover, it gives some colour and texture to research questions 2 and 3 of this thesis.

5.3. Google Analytics

Google Analytics works through the embedding of code into the website that puts a “cookie” onto the user’s computer which then tracks their usage. All data collected is anonymous. Google Analytics is useful because it can tell you the Average Session Duration, number of Sessions in an hourly period, how many Page Views in that hour and how many Users. While Google Analytics is a great tool it also has some limitations due to its use of cookies and how cookies function. Thus there can be levels of inaccuracy but for the data used here, since students had to log on, these issues would not affect the results.

For the data sets presented in this study I only looked at the “Non-Bounce” data; in Google Analytics a “bounce” is someone who clicks in to your site and then clicks back out, using the back button or entering a new web address, without visiting more than one page. Obviously I only wanted those users who visited multiple pages because they would represent my students since they had to log on; moreover, I did not want to exclude “new” users for the reasons stated in the previous paragraph about cookies. Thus the non-bounce data was the best representation of student usage of the site.

In the following graphs and data you will see Google Analytics data broken down into the Mean, Standard Deviation and Max for each time period and category. The time periods are broken into After Hours or AH and Class Time or CT. It should also be noted that the data below represents days which the website was accessed. Days in which *Mahara* was not accessed were omitted from the data sets.

	Average Session Duration Minutes
Mean - AH	8.46
Mean - CT	11.82
σ - CT	15.33
σ - AH	11.27
Max - AH	63.4
Max - CT	84.73

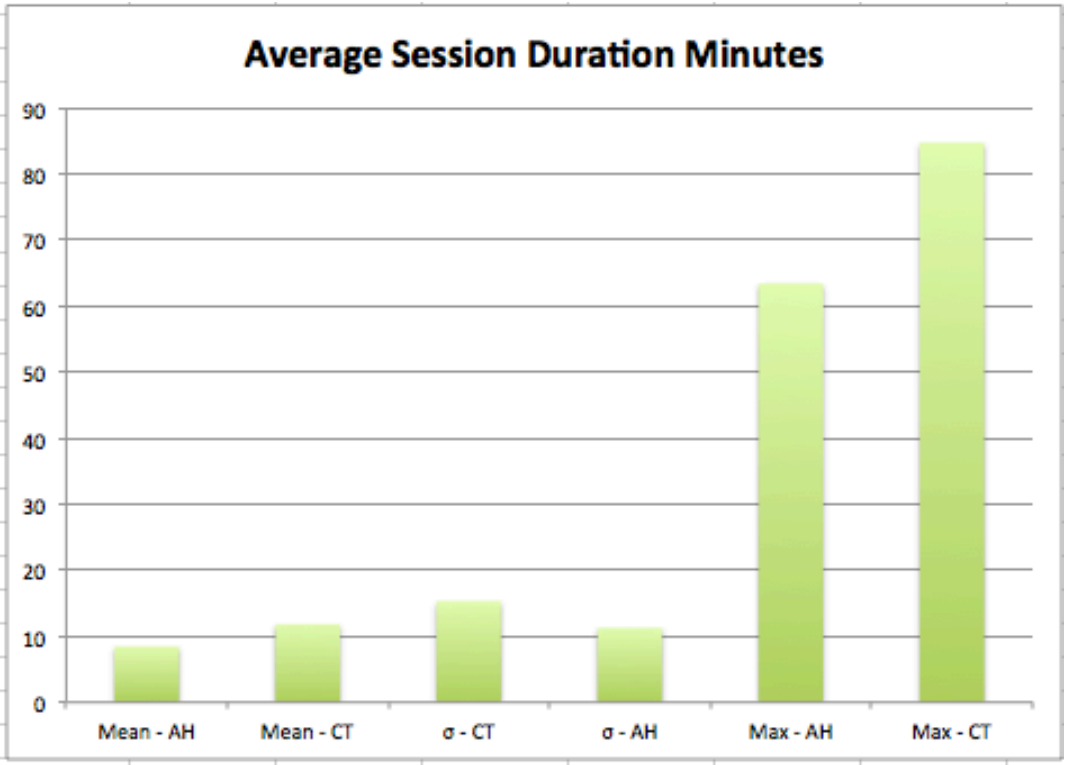


Figure 8. ***Mahara*** **Average Session Duration**

The graph on the previous page reveals the average time a user spent interacting with the website over an hour period once they had logged on. All times when there was no activity were disregarded in the calculations. When we consider the Standard Deviations we can see that there as a wide range of time uses in relationship to the Means; moreover, the Max shows the upper limits of usage. Students clearly used the website both during CT and AH for sustained periods of time when they utilized the learning environment. However, we don't know exactly what was done during those periods of time. Regardless this does shows that students interacted with the *Mahara* learning environment during CT and AH in an engaged way.

The next graph shows page views per hour. This was calculated by disregarding non-peak times and gaps in usage. Thus 19:00 to 09:00 were disregarded outright. Additionally if there were large gaps in usage. The question I was wanting to understand was: When students are on the site how active are they during a given hour? I assumed activity, or pages viewed, to be a form of engagement. Pages viewed reveal that students did more than one thing on the site. However, it should be noted that a low level of pages viewed at a given point in time does not mean that students were less engaged. For example, if a student logged on and only worked on a particular page assignment the statistics would show 2 maybe 3 page views; yet students may have been very engaged in developing their page at the time. Thus this should be seen as a certain type of engagement and not directly representative of engagement as a whole. This graph has also been separated by After Hours (AH) and Class Time (CT).

	Page Views
Mean - AH	8.57
Mean - CT	22.24
σ - AH	7.54
σ - CT	31.4
Max - AH	32
Max - CT	221

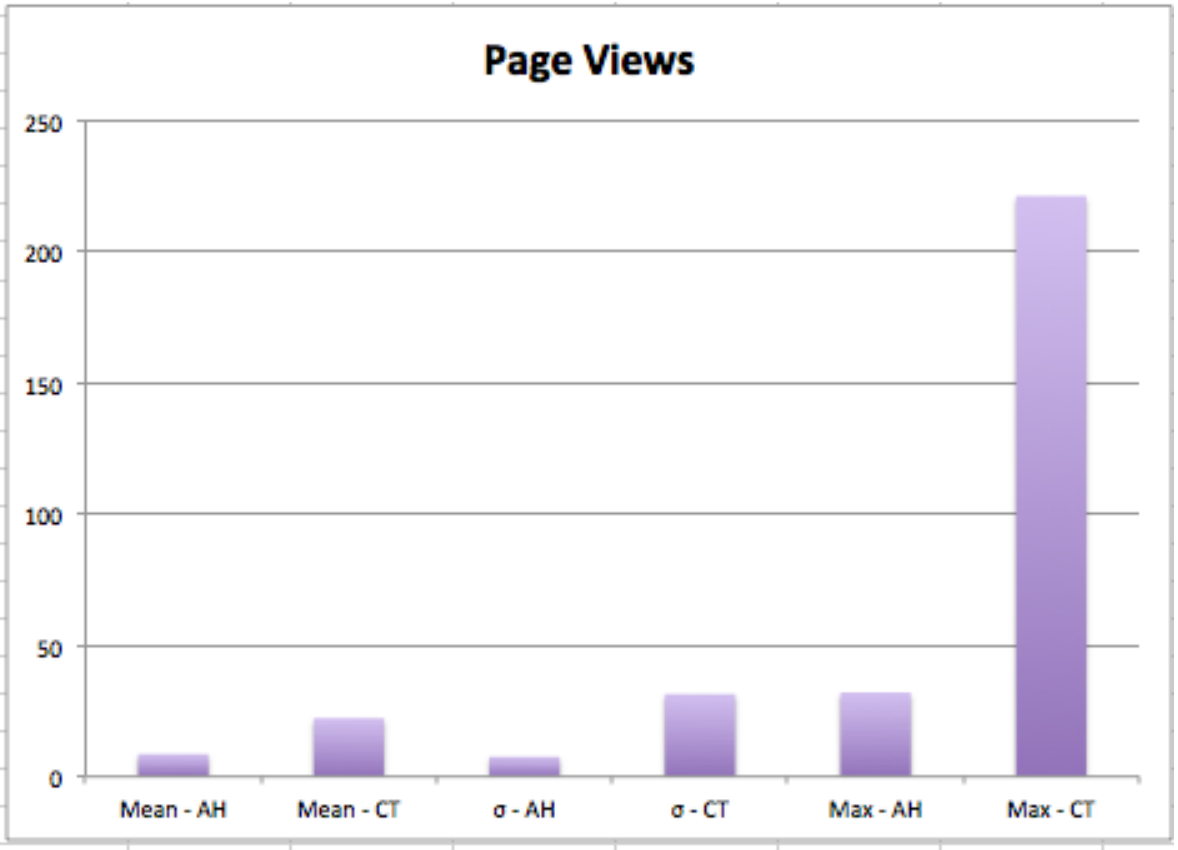


Figure 9. ***Mahara*** **Hourly Page Views**

Page Views per hour also show a level of moderate to significant engagement. Much like Session Duration the Standard Deviation reveals a wide spread of page views. When students used *Mahara*, on average, they did not just look at two or three pages but rather engaged with it through multiple pages and multiple interactions. This again supports the supposition that the *Mahara* learning environment was useful and engaging in addition to promoting student learning which again gives colour and texture to research question 2 and 3.

5.4. *Mahara* / LMS and Qualitative Data Considerations

While the quantitative data from both *Mahara* Statistics and Google Analytics shed a generally positive light on the *Mahara* learning environment, it is important to consider the perceptions of the students who used it in conjunction with the statistical data. This is the point at which we can gain some very real understanding as to how *Mahara* / LMS might have fostered engagement and encouragement in addition to understanding student's perceptions of whether *Mahara* / LMS had the capacity to incorporate indigenous perspectives and enhance learning. During the oral interview portions of this study, students were asked about their perceptions of the *Mahara* Learning Environment. Overall their responses were positive and are reflected in the following excerpts:

> Student 1: I think the website [Mahara] has been a positive experience.
>
> Student 2: Yeah I think it would be [a good thing] just to show each other how hard we have been working.
>
> Student 3: [Mahara is beneficial] because if we have homework we can do it if we go away [on the ferry to Prince Rupert] and stuff like that.
>
> Student 4: [Mahara is beneficial] because like if you go to like [Prince] Rupert you can still work or if you are home sick
>
> Student 5: Student indicates s/he would much rather work "online" because "I don't like writing".

In general students had a positive experience with the *Mahara* Learning Environment. Two students, Student 5 above and another student, had a particularly deep connection with *Mahara* in that it allowed them communicate their ideas better due to their struggle with hand writing and language. My own journal notes corroborate this. In particular, with one of the students who I taught for 3 years, I noticed a significant improvement in production and quality of work when s/he was allowed convey all their learning in the online learning environment; moreover, as a teacher, it was less of a struggle to get the student to produce his/her assignments. Thus this is a clear indication of *Mahara* / LMS enhancing student performance and fostering engagement as per research questions 2 and 3. While these two students showed a particular level of success, all students but one saw the *Mahara* learning environment as a positive and emancipating tool. I noted multiple times in my journal, that when given a choice, to convey their learning with pen and paper or online, the students overwhelmingly picked the online method. Another positive element students brought up was the capacity to access work from anywhere and in particular when they went to Prince Rupert; however, this was also seen as a bad thing because *"I would probably have to do more work"*.

While student perceptions were positive it was not without bumps in the road. My journal notes an initial resistance to *Mahara*. Students found *Mahara* challenging to use at the outset and there was certainly a learning curve. I noted in my journal during the initial implementation period that one student asked "Why do we have to use this stupid website thing anyway?" This initial bump in the road was also corroborated by a comparative analysis of the two Technology and Culture surveys (see Table 6 in Appendix) taken by the students. Students in general did rate their Actual experience with technology as better than their Preferred. It should also be noted that the survey did not reveal a huge jump; this lack of a big jump is probably due to the fact that students had been using *Mahara* consistently since January. Thus, by March, when the first survey was taken, many of the kinks and initial learning curve had been worked out by the class thereby creating a more positive response for the Preferred survey. It is also interesting to note that the Standard Deviations for the Preferred survey are significantly higher than for the Actual survey. Thus students' perceptions firmed up and coalesced around a more positive view of technology and *Mahara*. This statistical interpretation is

also corroborated by the qualitative interviews. Within those interviews students expressed that their learning experience with technology improved as they began to understand and learn more about that technology.

Despite the majority of students having a positive experience, there was one student who disliked *Mahara* for a number of reasons. The student said: *"I don't like the website because it's not good … like it doesn't have auto correct … like it doesn't … it's just not good …"*; moreover, students *"can't practice our printing."* Her/his experience reveals that learning environments should be responsive to their students' needs and learning styles. One size does not fit all. Thus I gave this student the option to convey their learning in other ways which was discussed with the student. This generally amounted to handwriting and paper portfolio generation; yet at times this student would opt for *Mahara*. My suspicion for this is possibly because all her/his cohort was utilizing it.

Within this study students had a positive experience with the *Mahara* Learning Environment; however, students did perceived a number of negative elements. Firstly students had an internal conflict with the capacity for their parents to Log On and see what they were doing at any time. Below are a few student comments about parental access:

> Student 1: There's a benefit. I just don't like the benefit.
>
> Student 2: I don't like it but it's probably better.
>
> Student 3: Like you want to let them see how much work you have done but then if you don't do the work they see you're not doing anything.
>
> Student 4: Um … the benefit is when they get to see your good work and the bad thing is if … umm … you're not doing your work.

Some students outright did not like the idea of having parents access their work with such ease. Mostly this was because it would mean "more work" but one student brought up the issue of privacy.

> Student: Well I wouldn't mind them going online to see what I'm doing but … um … like they usually ask if they can see what I'm

> doing but like they would invade my personal privacy. So I'm like ok … like if they keep an eye on me then they see what I'm doing and they're like … I like come downstairs and they're like "[students name] why aren't you doing your homework" and I'm like "ahhhh…"

The idea of unfettered access by parents/guardians was met with mixed emotions and feelings. Rationally students felt it was better for them but emotionally they did not like the idea.

The one element that all students consistently brought up when discussing *Mahara* and the online learning environment was the capacity for distraction. One student stated that, "*We get distracted … like some of us look at different things when we are supposed to be on the site [Mahara] … like not me but I catch other people."* Another student said s/he tends to start *"playing games"* online when they go to work on *Mahara*. By far the biggest draw for distraction is YouTube. Students all mentioned YouTube as a distracting force. Moreover, while distractions primarily happened when students accessed *Mahara* from home, students did indicate that distractions are also part of the classroom learning environment.

Pedagogically speaking, on the surface, this distracting force would be seen as a negative element of the online learning environment; it certainly was to the students. However, considering the broader educational goals of society, this capacity for distraction can be seen as teaching kids the tools for self-regulation. Throughout their lives they will have distracting forces and being able to rationalize with them, and have psychological tools to overcome them, will make those students more productive citizens. Thus the conclusions of this study will consider the distracting element of online learning as a positive in that, if taught appropriately, it promotes self-regulation.

Chapter 6.

Discussion and Limitations

In Chapter 6 I will analyze the data that was presented in Chapters 4 and 5. The initial sub-section will consider specific points of divergence, conflict, or interesting observations within the data. I will then consider the results in relationship to the initial research questions which will be outlined in section 6.2. It is in this section that I will answer my research questions. Then in section 6.3 there will be a discussion about study limitations and potential avenues for future research. Finally I will layout my final conclusions from this study.

6.1. Analysis of Research Question/Survey Results and Observations

6.1.1. Critical Voice and Shared Control

Critical Voice and Shared Control were two survey constructs which, while similar in what they measured, were strikingly divergent in results for the Actual Learning Environment survey. In effect Critical Voice and Shared Control are two sides of the same coin. Critical Voice is the capacity to have vocal agency within the class. This means a student feels that they can state their opinion and participate in the structure and design of the course. Shared Control is the student's perception of Critical Voice's manifestation if you will. In other words, Shared Control is where the student feels they have control over the classroom while Critical Voice is where the student feels they have a voice to raise opinions and objections that could potentially have an effect on the control of the classroom. In the Actual Learning Environment survey portion of this study Critical Voice received a mean score of 2.857 while Shared Control had a mean score of

3.942. This is a difference of more than 1 point, which is a bit odd since both these constructs are so interlinked. Thus I have to ask myself why.

During the oral interviews students realized that they probably had more shared control than they realized. This discontinuity between the oral interviews and the survey speaks to a couple aspects of the student teacher relationship in general. First, through the traditional model of education, students are conditioned to believe that they have no control, nor should they have control, over the classroom; as such they assume they have no control over their own experience. Secondly, the traditional teacher student relationship is one of social control and authority within power relations rather than capacity to share power (Freire, 2009, p. 72-73; Donnelly, McGarr, & O'Reilly, 2014, p. 2031-2034; Pitsoe & Letseka, 2013; Foucault, 1995, p. 135-194; Middleton, 2008; Gruenewald, 2003, p. 629-230). This narrative can be reaffirmed and conditioned within students through the consumption of popular culture which tends to structure these student / teacher oppositional narratives; the most iconic of which is Pink Floyd's "Another Brick in the Wall (Part II)" where the first four lines are: "We don't need no education / We don't need no thought control / No dark sarcasm in the classroom / Teachers leave them kids alone" (Gilmour & Waters, 1979); and of course who can forget "Ferris Bueller's Day Off" – a universally loved classic where a student undermines inept teachers and administrators (Chinich, 1986). Even in movies that are generally positive towards teachers, like "Stand and Deliver" and "Dangerous Minds", this traditional student teacher opposition can be seen. Teacher portrayals in popular culture have arguably been getting worse (Alsop, 2012). Yet for my students, part of the issue might have simply been terminology and perception. As illustrated in the oral interviews, when students were given a clearer definition of what Shared Control is and looks like, they then connected it to their own classroom experience.

While students, once they considered it, could give quite a few examples of points where they felt that they did have shared control they struggled more with naming points where they did not. Eventually, I offered the example of the dreaded "Reading Journal" which was not a universally loved exercise. This brought up the conversation that students felt least in control when having to do assignments that they "don't like".

Another example which I noted in my Teaching Journal was that, while students loved to go out and collect data in the field, their exuberance dropped dramatically when they had come back into the classroom to process that data. It is at this point where the issue of maturity resurfaces and the dynamic of student vs. teacher control comes into conflict. If certain grade 6-8 students had control they would only collect the data and never process it because collecting the data is “fun” but processing it can be “boring”.

The categories of Critical Voice and Shared Control brought forth some interesting dynamics between the student and teacher relationship; moreover, they crystalized the line between theoretical and practical implementation of Shared Control at the different maturity levels I observed with my students.

6.1.2. Openendedness

Certain students struggle with the capacity for designing and structuring their own learning which is the core of Open Endedness. For example, two thirds of my students would produce little to no work, and would struggle significantly, if they were given an assignment like this:

> We have just finished studying the stream flow of a local water way. Express what you have learned through art, diagrams and/or writing. You must include, in some way, the definition of “stream flow”, some of our findings, and the process of collecting the data.

Two thirds of the class would want much more specific instructions, their favourite of which is to just copy down facts and statements because then they know that “this” goes “there”. The goal and completion is clearly defined. The capacity for Open Endedness is again structured by the desire, motivation and maturity of the student to whom Open Endedness is given. It became clear to me that much of the variance between students’ Preferred and Actual Open Endedness was my pedagogical response to the two thirds of the class who just wanted to be told what to do. This brings up two interesting points. Firstly, students in grade school tend to be embedded with a closed ended structure to such an extent that they avoid the more intrinsically motivated open ended curriculum. Secondly, teachers can be caught up in what I would call a redundancy loop where the

inputs into the classroom dictate the outputs which then become the inputs for the next teacher's classroom. Thus, since two thirds of my students didn't respond well to an open ended design, I defaulted to a more closed design which both reinforced the two thirds of my classroom while neglecting one third of my classroom who then shifted their actual survey response from their preferred.

All this having been said it should be noted that you must learn how to walk before you can run. Having an Open Ended curriculum firstly requires a student to have a particular level of maturity. Yet that level of maturity is created through being given opportunities to cultivate maturity. This brings us back to the theories of Vygotsky and the Zone of Proximal Development. Thus, through the pedagogical technique of "scaffolding", teachers can facilitate students' cultivation of maturity and intrinsic desire; moreover, the ideal situation would be to have this cultivation coordinated throughout the grades. In other words the school experience would be developmental when treated as an entire, connected experience rather than a set of disconnected "grades" or "courses". This would break the redundancy loop of Closed Ended curriculum and facilitate a much more Open Ended and dialogic education by the senior grades.

However, coordination would have significant impacts on practice and pedagogy for everyone which is highly problematic in a public educational system; not the least of which is teacher autonomy, fundamental pedagogical disagreements/conflict, and teachers who have taught the same way for 20 years and are not going to change everything 3 years before retirement. Additionally, an unforeseen consequence could be pedagogical homogeny which, in my opinion, is a dangerous thing.

Yet there are many potential positives. Like the inclusion of more cross-grade / cross-curricular projects and inter-collegiality between teachers and departments with teachers who are less stressed about curriculum and marking and instead focus on facilitating student interests and goals. The growth of divergent pedagogical expressions can arise if the process is implemented in a decentralized and local way.

6.1.3. Student Negotiation

How students interacted and negotiated with each other through the course is important. Interestingly, as shown in section 4.2.6, students were pessimistic about their social interactions. Despite student's negative perceptions of their social environments, my Teaching Journal noted that students did have better negotiating skills than they gave themselves credit for. Additionally students did share robustly. My observations showed students would exchange resources, knowledge and understanding fluidly in addition to discussing ideas and what was on their mind. It is possible that, given the close connection and social environment of Hartley Bay, these points of sharing are so normalized as to be perceptually invisible to the students. Moreover, students did negotiate through projects without the teacher having to continually micromanage them. Given this, the question arises as to why students have this perception and why their preferred learning environment is in the "sometimes/never" range. Through my observations over the course of living in the *Gitga'at* community for three years I can see two possible explanations for this:

1. The remote isolation and village structure of the community is reflected in the students' desire for a well-defined personal space. When you live, eat and play with the same people all day every day you need to carve out spaces where you can work and/or be independent. Thus students didn't want to negotiate with students but wanted to have independent space at times.
2. In relation to perception of the social learning environment, students see the classroom as a microcosm of Hartley Bay in general. In other words, their perceptions of the classroom are reflective of their perceptions of the community.

Another factor might be the "fish bowl" effect. When your entire life is in the fish bowl of Hartley Bay it is hard to detach and see it with a fresh or different set of eyes. Thus, from my records, students' perceptions of their negotiation environment were possibly worse than my observations of it.

6.1.4. Co-Participatory Activities

This construct speaks to how students interact through the use of technology. While the survey itself focused mostly on online interaction within Mahara, there is some evidence from the oral interviews, and my journal notes, that there was a shift between students' social dynamics and relationships due to the use of technology. During the interviews, a number of students indicated that technology, beyond just the website but technology that we used in the class in a general sense, had allowed them to interact with students in new and positive ways. I also noted this in my journal notes. In particular I noticed this while utilizing the video cameras to interview and record the older students. The older students now had to take direction from the younger students. During the grad video the younger students interviewed the older student; it was interesting to note the nervousness of the older students and confidence of the younger students. All of this provided a shift in the power dynamics between the classes and, in my opinion, moved toward more collegiality and respect. Traditionally the older students were usually taking pictures/video of the younger students and in a more dominant role; however, this shifted and the students in my grade 6-8 class reversed roles with the grade 9-12 class. This new social dynamic altered these relationships in a more positive and equalizing way. Thus, I think the minor variation reflects how using technology in new and alternative ways can shift relationships and social dynamics by putting students into different roles and settings other than that provided by the traditional classroom.

6.1.5. Information Structure and Design

A limiting part of this study was the overall design of the website *Mahara* which the students noted in their survey and oral interviews. At one point in my journal notes I contemplated if it might be better to have the students create their own WordPress portfolio blogs. However, from a teacher perspective there are definitive positives to the *Mahara*. It is much easier to control, mark and direct; additionally it is created specifically for educational use and thus comes with an interface and tools designed for that. Also,

the way in which blocks[1] work in *Mahara* does create a capacity for more creativity by the novice user while with WordPress you need to utilize more web based design techniques and programs. In other words, WordPress would take much more time commitment to gain the level of expression you can get from *Mahara* fairly quickly. In the end students' opinions on this didn't change. They saw the site as only sometimes meeting their technical needs. While the student experience was not great from the perspective of *Mahara* as a tool, it should be put into perspective that this is an Open Source project and, despite having some support from the New Zealand Government, it is primarily a volunteer project.

6.1.6. [Place] and Technology

How do you experience the essence of a place while utilizing technology to both study and document your experience? There is no easy answer to this and it will be individualized by each community and culture. Ernie Hill, chief of the Eagle Clan for the *Gitga'at*, discussed this struggle with me while he fought to get technology to document the *Gitga'at* experience. Traditionally the *Gitga'at* elders, and Tsimshian elders in general, resisted any form of recording or technology; however, now, as the elders pass away with their grandchildren barely speaking a word of *Sm'algyax*, there is a strong push to begin to record everything as quickly as possible. Thus we need to find local ways to reconcile how technology can be incorporated with [place] and [place] with technology. Considering this the survey response numbers for [place] and technology represents a healthy perspective on how technology might be integrated.

6.2. Moving from Results to Considering Research Questions

I will now move into discussing the results of this study in relationship to the research questions asked. While elements of the results were somewhat mixed,

[1] Blocks, to recap, are editable sections of a page which display portfolio artifacts. Blocks can be retractable, placed or sized in creative ways. They can house text, images and videos.

holistically there was a clear indication that Hartley Bay School in particular, and remote communities in general, can benefit from an intertwining of [place]-based/indigenous and technological learning environments. But to understand this it is best to work our way through each research question in order to build up the foundation for this claim.

6.2.1. How do indigenous communities and students perceive learning environments?

The first research question asked how indigenous communities and students perceive learning environments which use their ecology of [place]. An intriguing element of the survey numbers on this learning environment is that they remained relatively flat. That is to say that there was very little change between the Preferred Learning Environment and their Actual Learning Environment. For example the mean numbers for "Relevance and Integration" were 2.85 and 2.51 respectively; or the mean numbers for "Environmental Interaction" were 2.9 and 2.85 (*Appendix B*). While there is a slight dip from Preferred to Actual there is nothing to indicate that there was a change of perspective. All the qualitative data suggested this as well (*Appendix A*). However, none of this should come as a surprise. Firstly, indigenous education was traditionally completely embedded in their ecology of [place]. In fact due to the loss of Sm'algyax fluency one could argue that it would be impossible to gain back that deep level of [place]-based learning since the English language is a colonial language and has no connection to the [place] of the *Gitga'at*. Take a word like S'yaan Luwi which literally translates to "ocean floor alder". This is a specific type of alder wood which has been seasoned and salted in the ocean that the *Gitga'at* use for smoking, preserving and cooking fish and food. This type of visceral connection between language, [place], ecology and education is the source of traditional education among the *Gitga'at*. As such the fact that the survey numbers didn't move much illustrates that [place] centric education is something the students are used to and connect with. Additionally, as previously alluded to, there also was clearly a close relationship between what the students wanted and what they actually experienced.

What is more interesting is the nuances below the surface which are revealed primarily through the qualitative data. In discussions students were very passionate about their culture and territory. They felt that it was vitally important to have a learning environment which not only respected that but fully integrated it into the fabric of the learning environment. Thus students' perceptions of this type of learning environment was hugely positive. My own observations were that students were most engaged and I had less classroom management issues when they directly connected the learning with their [place]. Yet all of this was tempered by the students with a strong desire to connect with the world outside of their [place]. This is actually a general theme amongst the *Gitga'at* elders and community. The Band Council and the school work hard in Hartley Bay to give students opportunities to travel beyond Hartley Bay and Prince Rupert in order to connect to the broader world. However, that being said, the students made a particular point to mention that, while they want to learn about places outside of their [place] they still wanted it to be connected to their [place]. Moreover, it is interesting to note that, over the course of the three months between each survey there was a shift away from considering Hollywood to be part of their culture: Preferred = 3.00 / Actual = 3.57. While minor, this finding does suggests that students were becoming more interested and engaged in their [place] and disenchanted with the glitter of the Hollywood cultural machine. Thus, in conclusion, the answer to the first research question would be that students positively perceived learning environments which used their ecology and culture but also desired to know how the world and its place functions in relationship to their [place].

6.2.2. Does the addition of modern technological tools foster engagement and encouragement within remote indigenous communities?

Technology is both a blessing and a curse. We have positive uses for nuclear technology but we also have pollution and weaponry; we can transport ourselves very quickly but we are warming the globe. Put simply, technology can have a positive impact on society and the negative impacts must be mitigated. Student responses reflected this double edged sword of technology. I would argue that this in itself is a positive reflection

on students, and technological integration, because they can navigate through those murky waters.

Students communicated that they loved to use technological tools, especially cultural ones like photography and video. In general the responses to the use of technology, be it computers or science tools like the salinity and temperature monitors, was positive; moreover, students felt more engaged with the data from the technology if they actually participated in its collection. A clear example of this were our excursions on the boat to collect data from Lu lax kyook. Top of the list for engagement was when the students were collecting data from beach seining. Students were immersed in finding aquatic life so they could record that data. They complained when the tide was coming up and we had to leave. Another great example was measuring stream flow where students used a flow metre at different parts of the river to average out water flow at high tide. In contrast, if I had given them a pen and paper assignment which give fake stream flow measurements and told them to calculate the stream flow the students would have been totally disengaged. Thus it was clear that holistically these tools did foster engagement and encouragement.

In particular *Mahara* also revealed that technology can enhance engagement and foster encouragement. There is a strong correlation between both the quantitative *Mahara* usage data and the qualitative oral interview data. Both data sets support each other's conclusions which are that the online *Mahara* learning environment had a moderate to more than moderate positive affect on the class's learning environment. When students engaged with the site they did so in a sustained manner. With one exception, students in general had a positive to more than positive view of the *Mahara* site; moreover, students were able to express their learning in unique individual ways through the use of artefacts and reflection. My Teaching Journal notes additionally reflect an overall positive trajectory despite some initial bumps at the beginning of *Mahara* implementation. In particular, two students who struggled with writing and language eventually attached to *Mahara* in a very positive way as it was seen as more conducive to their learning styles. Moreover, *Mahara* also made the connection between teacher, student and parent easier and more fluid. Parents had the ability to have a

much more watchful eye on their student's progress. It is important to note that *Mahara* was only used as an augmentation to the in-class and field-learning that was happening. It was not, like in some studies, the sole portal through which students learned. Rather, it became the method of choice for students to express their learning. This in itself reveals that the online learning environment, when used as an augmentation tool, can both support and enhance the learning taking place; moreover, students have the capacity to take control and personalize how they convey their learning.

While the overall data suggests that technological learning environments were perceived by students as generally positive, there was also a downside. Students collectively felt that technology can actually distract from their learning taking place. It was easy to load up the *Mahara* website with good intentions but eventually end up on YouTube for most of the time. However, this study has taken the stance that this is not entirely a negative outcome. Of course a student getting distracted and not doing their work is negative; however, utilizing this distraction as an opportunity to foster mindfulness and self-management techniques, is a significant positive. These students will eventually graduate and move into a world with a multitude of distractions. Learning how to manage and stay focused is a great real world skill.

Another downside to the use of technological tools, in particular computers and media, is that students felt they promoted a level of cultural homogeneity and diminished their own *Gitga'at* cultural vibrancy. I was happy and proud to hear the students make this assessment because it is entirely accurate; moreover, it illustrated that, when teaching with technological tools, we must continually antagonize the root metaphors and embedded assumptions within those tools. Again, while students saw this as a negative, this study sees this as a positive. Rather than mindlessly becoming a part of the monoculture through technological tool usage, the students could conceptualize the diminishment of their own culture there by moving them into praxis with the technological tool. Instead of using this tool as one of pure consumption, students began to see the need to use it as a tool of cultural creation. This in my view was a positive affect of utilizing these technological tools in my classroom.

6.2.3. Can the combination of [place]-based and LMS/technological learning environments incorporate indigenous perspectives and enhance student performance?

The first two research questions provide evidence to suggest that both [place]-based learning environments and technological learning environments are beneficial to remote indigenous populations. The results of the first two questions initiate the next question of whether it is beneficial to intertwine the two learning environments. Overall I will argue that the results do suggest that there is a benefit to intertwining these two types of learning environments.

Both the qualitative data and quantitative data indicate that students viewed the intertwining of [place] and technology positively (*Appendix A, Appendix B*). In particular with the qualitative "Benefits" section on "Technology and Culture" and "Technology and School Work". Also, as mentioned previously, students were most engaged with their discovery of [place] when they could do so creatively through photography or video with a preferred score of 2.125 on the Likert scale; additionally, students were more engaged when using technology to directly collect data about their place rather than reading or studying data already collected. The qualitative and quantitative data also suggest that students see an import part of preserving and promoting local culture in the future is through the digital medium. All of this suggests that when using technology within a [place]-based framework students will respond with more engagement and deeper learning. However there are some pitfalls to integrating technology that must be considered.

Firstly, in the order of operations, the [place]-based framework is paramount. The technological learning environment needs to be structured through he lens of a [place]-based learning environment. This is due to the general slant of technology makers and their products whose ethos is monopolization and thus homogenization (Chee, 2015). The detriment of technology on culture and [place] was mentioned by the students in the "Hindrance" section of the qualitative data (*Appendix A*). In order to counteract this, educators should attempt to wrap their technology use in [place]. Technological tool usage should not be dictated or structured by the makers or designers of those tools.

Rather, tool usage should take a [place]-centric bottom up approach and incorporate an open-source philosophy. In this way we do not look at the technological tool and ask what does the global multi-national designer want us to learn from this tool. Rather, we ask how this tool can be used to promote a chronoptic meaning making experience rooted in [place]. It is in this weaving of learning environments that we can incorporate indigenous, or any local, perspective; moreover, by doing this we naturally enhance student performance in a myriad of ways. Firstly, my students learned how to manipulate technology to their advantage rather than technology manipulating them into a particular way of being that was very empowering for my students. In particular, as outlined in the qualitative data, students were able to express themselves in more intricate ways along with understanding their culture and place in more detail (Appendix A). Additionally, having students create portfolios about their local place, and things they connected to, significantly increased work production; specifically for two students in particular who struggled with writing and reading, *Mahara* was very beneficial. In the end integrating critical technology use immersed in place will create critical students who are ready for a future economy of innovation and (re)localization. Additionally, student performance is enhanced because they are not only connect with a curriculum rooted in [place] but also with a technology rooted in enhancing [place].

While the conclusions of this study would never suggest that a technological learning environment should be a part of every aspect of a [place]-based learning environment, it does conclude that these learning environments are not mutually exclusive or inherently antagonistic. Rather, when designed properly, the technological learning environment can be a great enhancement to a [place]-based learning environment. Moreover, the utilization of a technological learning environment as a means to enrich [place]-based cultural creation should become an increasing focus of [place]-based educators. Finally, remote indigenous communities will benefit from a healthy mixture of both [place]-based and technological learning environments.

Interestingly, while my education is in English and Humanities, my new assignment in Prince Rupert is specifically around the integration of science, technology and media. Thus, in many ways, my role is somewhat reversed in that I'm given

technology to teach and must wrap it in [place]. Yet without a doubt this pedagogy of integrating technology into [place] has become an integral part of my job as an educator.

6.3. Limitations, Recommendations and Further Research

While this research has produced some interesting conclusions there are limitations that should be considered. The most significant limitation to this research has been the number of participants. Yet this is a tough limitation to deal with. In order to get a higher sample size you would have to incorporate more remote communities, yet in doing so you would naturally lose a level of local nuance. In fact gaining a statistically relevant sample size could take upwards of 50 or more remote communities the size of Hartley Bay. While this would give you broader perspective of remote communities in general it would also wash out nuanced insights into the separate communities, or cultural groups (i.e. Tsimshian, Haida, Haisla, etc.), in specific. However, an interesting compromise might be to do a more longitudinal quantitative gathering method over a smaller cultural area. Regardless, when dealing with remote communities, it is good to assess whether or not qualitative data and smaller sample size would be better than larger sample size and more generalized conclusions and insights. This study chooses the former over the latter because its primary concern was the *Gitga'at* culture and place. This therefore limits the broad generalizations which can be taken from this study.

Another limitation in line with the previous is that this study only focuses on one location and ethnic/cultural group. In this school, aside from my son, you are either *Gitga'at* or you do not attend and thus there is no multicultural element to this study. It should be noted that the school is in no way racially biased but the student population is symptomatic of its geolocation, its limited housing and the fact that its reservation land which is collectively owned and not privatized. But the homogeneity of the sample population does limit this study's results and its applicability outside of the *Gitga'at* context. Further research should be done in other cultural contexts and comparisons between results could shed interesting light on all studied populations. Such a method

could stop the washing out effect of broader bigger studies while still giving a larger picture through comparative analysis between a series of smaller studies.

Holistically, while this study gives us wisdom about the *Gitga'at* experience, the practical implementations of its conclusions beyond the *Gitga'at* are limited. However, this study's results should be seen as an inspiration to attempt intertwining technological learning environments into the tree of [place]-based learning environments for all remote communities. I would recommend taking these results and manipulating them to your local [place]-based context.

In addition to implementing similar studies in other remote communities and comparing and contrasting the results, a further area of study could be to see if an open source exchange hub for [place]-based and technological learning environments enhanced the implementation of this pedagogy. This could facilitate a deeper and broader discussion into the integration of technological learning environments into [place]-based ones. Discussions need to be had about how technology detracts from the actual experience of [place] itself. If you are viewing everything through the lens of a camera, or scientific instrument, what space is there to truly connect with [place] on a phenomenological level? This is an important question to keep in mind when developing an integrated curriculum like the one presented in this study. What is the right mixture?

6.4. Conclusion

There is no magic bullet in education and the search for one, or the implementation of educational fads, is a futile effort like turning lead into gold. Educational communities, rooted in [place] as they are, need to assess their learning environments and tailor it to their individual community's needs. That said, technology, innovation and change have been with us since the dawn of cell division. If [place]-based pedagogies refuse to incorporate modern technology and innovation, and thus become an innovation themselves, then they will stagnate and become irrelevant. As discussed in section 2.7 of this thesis, technology and its social integration is exponentially expanding. Currently, the kids I teach have never known a world without the Internet.

Whether good or bad, social media has become a natural part of most students' social lives. While I dislike being fatalistic, love it or hate it, technology is, and will increasingly be, an intricate part of human existence; it could be argued that the smartphone is now a natural extension of the human body. Yet the most important part for [place]-based pedagogy is relevance. Our students are bound to technology and this will only increase. Thus [place]-based pedagogy needs to utilize and incorporate technology or this pedagogy will cease connecting with subsequent generations. I should be clear that this is not to suggest that we should not provide opportunities to be technology free and viscerally experience the place in the purity of the Da-sein; however, if technology is abandoned or refused then [place]-based pedagogy will fade into irrelevance.

Yet technology should not be the dominant force. As my Figure 1 tri-force diagram in subchapter 2.10 illustrates, it is one of four components of the whole. While [place]-based pedagogy is at the centre, and acts as a moderating force for technology in education, an equally significant component is indigenous pedagogy. As discussed in subchapter 2.1, the incorporation of indigenous worldviews shifts the western dominant worldview. Indigenous perspectives allow the (re)integration of new and alternative metanarratives, or root metaphors, into contemporary education and technology. Through an indigenous perspective we can step back and see the intergenerational effects of technology on both the culture and environment. When approaching how to use technology in the classroom we can use the Four Directions to assess and (re)assess a technology's effects. Moreover, indigenous pedagogy implores us to consider how to incorporate traditional teaching techniques like oral stories and learning through doing. All of this will help moderate how [place]-based and technological learning environments interact in addition to broadening the number of educational tools for a multiplicity of learners. Yet it is important that [place]-based learning environments, while being the centre, incorporates technological learning environments or the pertinence of [place]-based learning will come into question.

Yet it is more than just fading into irrelevance. In actuality [place]-based pedagogy has a duty to incorporate technology in order to teach future generations how to culturally diversify technology. In juxtaposition to [place]-based pedagogy's descent

into irrelevance, if technology-based pedagogies refuse to incorporate [place] they will institute a global homogeny that will destroy the diversity which is the mother of all innovation and invention (Abram, 1997, p. 265-267; Gruenewald, 2008, p. 143; Klein, 2000; Ouédraogo, 2005, p. 11, 20). The *Gitga'at* children talk about how they spend more time consuming popular culture from Hollywood than consuming, participating and creating their own culture. This is a well documented issue, possibly even crisis, in the indigenous worldview (Bowers, 2013; Martusewicz 2013). In my discussion with *Gitga'at* elders they have noted a serious decline in their cultural capacity. In particular a number of elders noted how the TV practically killed their oral telling tradition; before satellite TV was integrated into the community it was a regular occurrence for the children and community to gather at each other's houses for oral stories; this was the "pre-TV" entertainment. Thus TV has hurt the oral story tradition of the Gitga'at people. Interestingly the incorporation of satellite TV was a big debate within the community at the time; one lady in particular, after years to reflect and see the change, really lamented her support for it at the time. Yet, as I told her, if they did not incorporate it then, they would have incorporated it by now. As such it would have only delayed the inevitable. Which brings me back to my main point and the need for [place]-based pedagogy to integrate technology but on its own terms. If future generations of *Gitga'at* can move from consumers of popular culture into creators of local culture, then the *Gitga'at* can stem the tide of cultural homogenization in their community. By blending technology with indigenous ways of being, something the Gitga'at have been doing for 200 years, the Gitga'at can create a locally responsive [place]-based education curriculum which prepares their students for the world outside while progressing their [place]-based and indigenous worldview.

In short, the source of human evolution is through the intertwining of technology into [place] where the technology itself becomes a reflection of [place] rather than a centralized imposition on it. This study shows that this is not only possible, but beneficial if technological tools are used in [place] appropriate ways. As the *Gitga'at* navigate an increasingly connected and technologized world, they are utilizing technology in order to reflect and develop their rootedness in [place] and assert their indigenous worldview thereby contributing to global diversity in the face of global homogeny.

References

+++The Mentor+++. (1986, January 8). \/\The Conscience of a Hacker/\/. In *Phrack Magazine*. Retrieved from http://phrack.org/issues/7/3.html.

2600 Magazine. Retrieved from http://www.2600.com/.

Abram, David. (1997). *The Spell of the Sensuous*. Toronto: First Vintage.

Adaawx. (n.d.). In *Sm'algyax Living Legacy Talking Dictionary*. Retrieved from http://web.unbc.ca/~smalgyax/

Alexander, H. (2013). Traditions of Inquiry in Education: Engaging the Paradigms of Educational Research. *A Companion to Research in Education*. 13-25. Retrieved from http://link.springer.com.proxy.lib.sfu.ca/chapter/10.1007/978-94-007-6809-3_2/fulltext.html

Alexander, J., Jarman, R., McClune, B., & Walsh, P. (2008). From rhetoric to reality: advancing literacy by cross-curricular means. *Curriculum Journal*, 19(1), 23-25.

Alternative Keyboard Layouts Explained: Should You Switch to Dvorak or Colemak?. (n.d.). In *How-To Geek*. Retrieved from http://www.howtogeek.com/189270/alternative-keyboard-layouts-explained-dvorak-colemak-and-whether-you-should-care/.

Alsop, E. (2012, September 14). Not So Hot for Teacher. *The New York Times Magazine*. Retrieved from http://www.nytimes.com/2012/09/16/magazine/not-so-hot-for-teacher.html?_r=0

Bai, H. (2001). Challenge for Education: Learning to Value the World Intrinsically. *Encounter*, 14(1), 4-16.

Bain, J. D., McNaught, C., Mills, C., & Lueckenhausen, G. (1998). Describing Computer-Facilitated Learning Environments in Higher Education. *Learning Environments Research*, 1(2), 163-180.

Bakhtin, M. M. (2004). *The Dialogic Imagination* (15th ed.). (C. Emerson & M. Holquist, Trans.). Austin, TX: University of Texas Press. (Original work published 1934-1941).

Barak, M., Waks, S., & Doppelt, Y. (2000). Majoring in Technology Studies at High School and Fostering Learning. *Learning Environments Research*, 3(2), 135-158.

Barkan, J. (2011, Winter). Got Dough? How Billionaires Rule Our Schools. *Dissent*. Retrieved from http://www.dissentmagazine.org/article/got-dough-how-billionaires-rule-our-schools

Battiste, M. (1998). Enabling the autumn seed: Toward a deconlonized approach to aboriginal knowledge, language, and education. *Canadian Journal of Native Education*, 22(1), 16-27.

Bell, N. (2013). Anishinaabe Bimaadiziwin: Living Spiritually with Respect, Relationship, Reciprocity, and Responsibility. In A. Kulnieks, D. R. Longboat, & K. Young (Eds.) *Contemporary Studies in Environmental and Indigenous Pedagogies: A Curricula of Stories and Place*. Rotterdam: Sense Publishers.

Bennington, C. (2015, February 10). In Less than Two Years, a Smartphone Could be Your Only Computer. *WIRED*. Retrieved from http://www.wired.com/2015/02/smartphone-only-computer/

Bergek, A., Jacobsson, S., Carlsson, B., Lindmark, S., & Rickne, A. (2008). Analyzing the Function Dynamics of Technological Innovation Systems: A Scheme of Analysis. *Research Policy*, 37(3), 407-429.

BC's Education Plan. Retrieved from http://www.bcedplan.ca/.

BC Liberals. Response to BCCPAC. *Todays BC Liberals*. PDF Format. Retrieved from http://bccpac.bc.ca/sites/default/files/articles/bccpac.liberal.response.pdf

BCTF. *21st Century Learning Initiatives*. Retrieved from https://bctf.ca/IssuesIn Education.aspx?id=21968

Bowers, C. A. (1996). The Cultural Dimensions of Ecological Literacy. *Journal of Environmental Education*, 27(2), 5-10.

Bowers, C. A. (2001). Computers, Culture, and the Digital Phase of the Industrial Revolution: Expanding the Debate on the Educational Uses of Computers. *The Trumpeter: Journal of Ecosophy*, 17(1). Retrieved from http://trumpeter.athabascau.ca/index.php/trumpet/article/view/134/157.

Bowers, C. A. (2013). The Role of Environmental Education in Resisting the Global Forces Undermining What Remains of Indigenous Tradition of Self-Sufficiency and Mutual Support. In A. Kulnieks, D. R. Longboat, & K. Young (Eds.) *Contemporary Studies in Environmental and Indigenous Pedagogies: A Curricula of Stories and Place*. Rotterdam: Sense Publishers.

Bowers, C. A. (2014). Is the Digital Revolution Driven by an Ideology?. *Studies in Sociology of Science*, 5(3), 169-178.

Boykoff, J., & Sand, K. (2008). *Landscapes of Dissent: Guerrilla Poetry & Public Space*. Long Beach: Palm Press.

Brandom, R. (2014, December 28). New Documents Reveal Which Encryption Tools the NSA Couldn't Crack. In *The Verge*. Retrieved from http://www.theverge.com/2014/12/28/7458159/encryption-standards-the-nsa-cant-crack-pgp-tor-otr-snowden.

Brown, J. S., & Duguid, P. (2000). *The Social Life of Information*. Boston: Harvard Business School Press.

Bryceson, K. (2007). The Online Learning Environment - A New Model Using Social Constructivism and the Concept of 'Ba' as a Theoretical Framework. *Learning Environments Research*, 10(3), 189-206.

Cajete, G. (1994). *Look to the Mountain: Ecology of Indigenous Education*. Skyland: Kivaki Press.

Coaster, J. (2014, May 29). TrueCrypt is no Longer Secure - Government Power and the Open Source Questions Pop up Again. In *siliconANGLE*. Retrieved from http://siliconangle.com/blog/2014/05/29/truecrypt-is-no-longer-secure-government-power-and-the-open-source-questions-pop-up-again/.

Chacos, B. (2015, August 6). Why Windows 10 Isn't Really Free: The Subtle New World of Built-In Costs. In *PCWorld*. Retrieved from http://www.pcworld.com/article/2957365/windows/why-windows-10-isnt-really-free-the-subtle-new-world-of-built-in-costs.html.

Chang, V., & Fisher, D. (2003). The Validation and Application of a New Learning Environment Instrument for Online Learning in Higher Education. In M. S. Khine & D. Fisher (Eds.), *Technology-Rich Learning Environments: A Future Perspective* (pp. 1-20). London: World Scientific.

Chaos Computer Club. Retrieved from https://www.ccc.de/en/.

Chee, F. Y. (2015, October 1). EU Antitrust Chief says Apple, Google Cases Show no U.S. Bias. In *Reuters: Edition US*. http://www.reuters.com/article/2015/10/01/us-eu-antitrust-apple-google-idUSKCN0RV5UR20151001

Chen, Z. S. C., Yang, S. J. H., & Huang, J. J. S. (2015). Constructing an E-portfolio-based Integrated Learning Environment Supported by Library Resouces. *The Electronic Library*, 33(2), 273-291.

Chromium Projects, The. (n.d.). Retrieved from https://www.chromium.org/.

Clayton, J. (2003). Technology-Rich Learning Environments: A Future Perspective. In M. S. Khine & D. Fisher (Eds.), *Technology-Rich Learning Environments: A Future Perspective* (pp. 157-186). London: World Scientific.

Compare School Rankings.org. *Fraser Institute*. Retrieved from http://www.compareschoolrankings.org/

Curriculum Documents by Grade. (n.d.). *British Columbia Ministry of Education*. Retrieved from https://www.bced.gov.bc.ca/irp/by_grade.php?lang=en&gradelevel=K-12

Davis, W. (2009). *The Wayfinders: Why Ancient Wisdom Matters in the Modern World*. Toronto: House of Anansi Press.

Daybreak North. (2015, June 11). Prince Rupert students must learn indigenous language from September. In *CBC News*. Retrieved from http://www.cbc.ca/news/canada/british-columbia/prince-rupert-students-must-learn-indigenous-language-from-september-1.3108193

DEF CON. Retreived from https://www.defcon.org/

Derrida, J. (2005). *Writing and Difference*. (A. Bass, Trans.). Taylor & Francis e-Library. (Original work published 1967)

Donnelly, D. F., McGarr, O., & O'Reilly, J. (2014). Just Be Quiet and Listen to Exactly What He's Saying: Conceptualising Power Relations in Inquiry-Orientated Classrooms. *International Journal of Science Education*. 36(12), 2029-2054.

Economides, N., & Katsamakas, E. (2006). Two-Sided Competition of Proprietary vs. Open Source Technology Platforms and the Implications of the Software Industry. *Management Science*, 52(7), 1057-1071.

EFF. (2015, December 1). Google Deceptively Tracks Students' Internet Browsing, EFF Says in FTC Complaint. In *Electronic Frontier Foundation*. Retrieved from https://www.eff.org/press/releases/google-deceptively-tracks-students-internet-browsing-eff-says-complaint-federal-trade

Eijck, M., and Roth, W. M. (2010). Towards a chronotopic theory of 'place' in place-based education. *Cultural Studies of Science Education*, 5(4), 869-898.

Ehrcke, T. (2011, September) Privatizing of Public Education: Only in America or Coming to a School Near You?. *Teacher Newsmagazine*, 24(1). Retrieved from http://www.bctf.ca/publications/NewsmagArticle.aspx?id=23825

Electronic Frontier Foundation. (n.d.). Retrieved from https://www.eff.org/.

Evering, B., & Longboat, D.R. (2013). An Introduction to Indigenous Environmental Studies. In A. Kulnieks, D. R. Longboat, & K. Young (Eds.) *Contemporary Studies in Environmental and Indigenous Pedagogies: A Curricula of Stories and Place*. Rotterdam: Sense Publishers.

Finley, K. (2013, August 8). Apple's Operating System Guru Goes Back to his Roots. In *WIRED*. Retrieved from http://www.wired.com/2013/08/jordan-hubbard/.

Finley, K. (2015, September 6). Open Sourcing is no Longer Optional, Not Even for Apple. In *WIRED*. Retrieved from http://www.wired.com/2015/06/open-sourcing-no-longer-optional-not-even-apple/.

Fisher, D. L., & Fraser, B. J. (1981). Validity and Use of the My Class Inventory. *Science Education*, 65(2), 145-156.

Flanagan, T., Alcantara, C., & Le Dressay, A. (2010). *Beyond the Indian Act: Restoring Aboriginal Property Rights.* Montreal, QC: McGill-Queen's University Press

Foucault, M. (1995). *Discipline & Punish: The Birth of the Prison*. New York, NY: Vintage Books.

Fraser, B. J. (1991). Two Decades of Classroom Environments Research. In B. J. Fraser & H. J. Walberg (Eds.), *Educational Environments: Evaluations, Antecedents and Consequences* (pp. 3-27). Oxford: Pergamon Press.

Fraser, B. J. (1998a). The Birth of a New Journal: Editor's Introduction. *Learning Environments Research*, 1(1), 1-5.

Fraser, B. J. (1998b). Classroom Environment Instruments: Development, Validity and Applications. *Learning Environments Research*, 1(1), 7-33.

Fraser, B. J. (2007). Learning Environments Research: Yesterday, Today and Tomorrow. In S. C. Goh & M. S. Khine (Eds.), *Studies in Educational Learning Environments* (pp. 1-26). Hong Kong: World Scientific.

Fraser, B. J., & Tobin, K. (1991). Combining Qualitative and Quantitative Methods in Classroom Environment Research. In B. J. Fraser & H. J. Walberg (Eds.), *Educational Environments: Evaluations, Antecedents and Consequences* (pp. 3-27). Oxford: Pergamon Press.

Fraser, B. J., & Teh, G. P. L. (1994). Effect Sizes Associated with Micro-Prolog-Based Computer-Assisted Learning. *Computers & Education*, 23(4), 187-196.

Fraser, B. J., Walberg H. J., Welch W. W., & Hattie, J. A. (1987). Syntheses of Education Productivity Research. *International Journal of Education Research,* 11(2), 145-252.

FreeBSD Project, The. (n.d.). Retrieved from https://www.freebsd.org/.

Freeman, S. (2009, Sept. 20). 1 in 6 First-year University Students Won't Make the Grade. *Toronto Star*. Retrieved from http://www.thestar.com/news/canada/2009/09/20/1_in_6_firstyear_university_students_wont_make_the_grade.html

Freire, P. (2009). *Pedagogy of the Oppressed*. New York, NY: Continuum International Publishing Group Inc.

Frequently Asked Questions. (n.d.). In *Wikimedia Foundation*. Retrieved from https://wikimediafoundation.org/wiki/FAQ/en.

Green, M. (2015, February 18). A Few Thoughts on Cryptographic Engineering [Weblog]. Retrieved from http://blog.cryptographyengineering.com/2015/02/another-update-on-truecrypt-audit.html.

Greenwald, G., & MacAskill, E. (2013, June 7). NSA Prism Program Taps into User Data of Apple, Google and Others. In *The Guardian: International*. Retrieved from http://www.theguardian.com/world/2013/jun/06/us-tech-giants-nsa-data.

Grekul, J., Krahn, A., & Odynak, D. (2004). Sterillizing the "Feeble-minded": Eugenics in Alberta, Canada, 1929-1972. *Journal of Historical Sociology*, 17(4), 358-384.

Gruenewald, D. A. (2003). Foundations of Place: A Multidisciplinary Framework for Place-Conscious Education. *American Educational Research Journal*, 40(3), 619-654.

Gruenewald, D. A. (2008). Place-Based Education: Grounding Culturally Responsive Teaching in Geographical Diveristy. In D. A. Gruenewald & G. A. Smith (Eds.), *Place-based Education in the Global Age.* New York, NY: Lawrence Erlbaum.

Gruenewald, D. A., & Smith, G. A. (2008). *Place-based Education in the Global Age*. New York, NY: Lawrence Erlbaum.

Gutstein, D. (2012, June 30). Pearson's Plan to Control Education: Report to the B.C. Teachers' Federation. Retrieved from http://www.bctf.ca/uploadedFiles/Public/Issues/Privatization/PearsonGutsteinReport.pdf

Hack Canada. (n.d.). Retrieved from https://www.hackcanada.com/.

Hacklab.to. (n.d.). Retrieved from https://hacklab.to/.

Hammonds, E. M., & Herzig, R. M. (2009). *The Nature of Difference: Sciences of Race in the United States from Jefferson to Genomics*. Cambridge, MA: MIT Press.

Hardesty, L. (2015, September 9). First New Cache-Coherence Mechanism in 30 Years. *MIT News*. Retrieved from http://news.mit.edu/2015/first-new-cache-coherence-mechanism-30-years-0910

Harwell, S. H., Gunter, S., Montgomery, S., Shelton, C., & West, D. (2001). Technology Integration and the Classroom Learning Environment: Research *For* Action. *Learning Environments Research*, 4(3), 259-286.

Hawley, A., Kusimo, P. S., & Parrott, L. (2001). Grading and the Ethos of Effort. *Learning Environments Research*, 3(3), 229-246.

Hill, Paul. (2006). A Foundation Goes to School. *Education Next*, 6(1).

Hyslop, K. (2012, October 5). BC Education Plan Linked to Private Corporations. *The Tyee*. Retrieved from http://thetyee.ca/News/2012/10/05/BC-Education-Plan/

IUCN. (1970). *International Working Meeting on Environmental Education in the School Curriculum. Final Report.* Retrieved from http://eric.ed.gov/?id=ED045490

Janz. J. (Producer). (2015, June 8). Lu lax kyook Ecological Monitoring Project. *Hartley Bay Elem Jr Sec School*. Video retrieved from https://www.youtube.com/watch?v=SWJLI96xvz0

Janz, J. (Producer). (2016, June 28). The Kiel Trip - TREC². *Pacific Coast School*. Video retrieved from https://www.youtube.com/watch?v=25VcppnCY14

Keizer, G. (2013, June 18). The Microsoft Breakup that Never Happened. In *ComputerWorld*. Retrieved from http://www.computerworld.com/article/2497911/microsoft-windows/the-microsoft-breakup-that-never-happened.html

King, T. (2003). *The Truth About Stories: A Native Narrative*. Toronto, ON: House of Anansi Press Inc.

Klein, N. (2000). *No Logo: Taking Aim at the Brand Bullies*. Toronto, ON: Vintage Canada.

Knapp, C. E. (2008). Place-based Curricular and Pedagogical Models: My Adventures in Teaching Through Community Contexts. In D. A. Gruenewald and G. A. Smith (Eds.), *Place-based Education in the Global Age* (pp. 5-29). New York: Lawrence Erlbaum.

Koomey, J. G., Berard, S., Sanchez, M., & Wong, H. (2011). Implications of Historical Trends in the Electrical Efficiency of Computer. *IEEE Annuls of the History of Computing*, 33(3), 46-54.

Koomey, J. G., & Naffziger, S. (2015, March 31). Moore's Law Might be Slowing Down, but not Energy Efficiency. *IEEE Spectrum*. Retrieved from http://spectrum.ieee.org/computing/hardware/moores-law-might-be-slowing-down-but-not-energy-efficiency

Kimmerer, R. W. (2013). The Fortress, the River and the Garden: A New Metaphor for Cultivating Mutualistic Relationship Between Scientific and Traditional Ecological Knowledge. In A. Kulnieks, D. R. Longboat, & K. Young (Eds.) *Contemporary Studies in Environmental and Indigenous Pedagogies: A Curricula of Stories and Place*. Rotterdam: Sense Publishers.

Larsen, K. (2016, April 12). Leap Manifesto A Bad Fit for B.C. Says NDP Leader John Horgan. In *CBCNews | British Columbia*. Retrieved from http://www.cbc.ca/news/canada/british-columbia/leap-manifesto-a-bad-fit-for-b-c-says-ndp-leader-john-horgan-1.3485585.

LeVasseur, J. J. (2003). The Problem of Bracketing in Phenomenology. *Qualitative Health Research*, 13(3), 408-420.

Lipponen, L. (2000). Towards Knowledge Building: From Facts to Explanations in Primary Students' Computer Mediated Discourse. *Learning Environments Research*, 3(2), 179-199.

Linux. (n.d.). Retrieved from https://www.linux.com/.

Liu, C., Zandvliet, D. B., & Hou, I. L. (2012) The Learning Environment Associated with Information Technology Education in Taiwan: Combining Psychosocial and Physical Aspects. *Learning Environments Research*, 15(3), 379-402.

Logan, K. A., Crump, B. J., & Rennie, L. J. (2006). Measuring the Computer Classroom Environment: Lessons Learned From Using a New Instrument. *Learning Environments Research*, 9(1), 67-93.

Lopez, K. A., & Willis, D. G. (2004). Descriptive Versus Interpretive Phenomenology: Their Contributions to Nursing Knowledge. *Qualitative Health Research*, 14(5), 726-735.

Lorsbach, A. W., & Jinks, J. L. (1999). Self-Efficacy Theory and Learning Environments Research. *Learning Environments Research,* 2(2), 157-167.

Lowan-Trudeau, G. (2013). Indigenous environmental education research in North America: A brief review. In R. B. Stevenson, M. Brody, J. Dillon, A. E. J. Wals (Eds), *International handbook of research on environmental education* (pp. 404-407). NY,NY: Routledge.

Lupinacci, J. (2013). Eco-Ethical Environmental Education: Critically and Ethically Examining Our Preceptions of Being Human. In A. Kulnieks, D. R. Longboat, & K. Young (Eds.) *Contemporary Studies in Environmental and Indigenous Pedagogies: A Curricula of Stories and Place*. Rotterdam: Sense Publishers.

Mantelero, A. (2014). Social Control, Transparency, and Participation in the Big Data World. *Journal of Internet Law*, 17(10), 23-29.

Mahara: Open Source E-Portfolios. (n.d.) Retrieved from https://mahara.org/.

Marsden, S. (2002). Adawx, Spanaxnox, and the Geopolitics of the Tsimshian. *BC Studies*, 135(Autumn 2002), 101-135.

Martusewicz, R. A. (2013). Towards an Anti-Centric Ecological Culture. In A. Kulnieks, D. R. Longboat, & K. Young (Eds.) *Contemporary Studies in Environmental and Indigenous Pedagogies: A Curricula of Stories and Place*. Rotterdam: Sense Publishers.

Marx, L. (2005). The Idea of Nature in America. In Tazi, N. (Ed.) *Keywords | Nature: For a Different Kind of GlobalizationI* (pp. 37-63). New York, NY: Other Press.

McCarthy, T. (2015, February 23). NSA Director Defends Plan to Maintain 'Backdoors" into Technology Companies. In *The Guardian: International*. Retrieved from http://www.theguardian.com/us-news/2015/feb/23/nsa-director-defends-backdoors-into-technology-companies

McFalls, E. L., & Cobb-Roberts, D. (2001). Reducing Resistance to Diversity Through Cognitive Dissonance Instruction: Implications for Teacher Education. *Journal of Teacher Education*, 52(2), 164-172.

McGregor, D. (2012). Anishinaabe Environmental Knowledge. In A. Kulnieks, D. R. Longboat, & K. Young (Eds.) *Contemporary Studies in Environmental and Indigenous Pedagogies: A Curricula of Stories and Place*. Rotterdam: Sense Publishers.

McKenzie, R. B., & Shughart, W. F. II. (1998, Fall). Is Microsoft a Monopolist. *The Independent Review*, 3(2). Retrieved from http://www.independent.org/publications/tir/article.asp?issueID=28&articleID=322

Metz, S. M., & Albernhe-Giordan, H. (2010). E-Portfolios: A Pedagogical Tool to Enhance Creativity in Student's Project Design. *Procedia: Social and Behavioral Sciences*, 2(2), 3563-3567.

Middleton, J. (2008). The Experience of Corporal Punishment in Schools, 1890-1940. *History of Education*, 37(2), 253-275.

Millar, E. (2014, October 21). The Expectations Gap: Students' and Universities' Roles in Preparing for Life After Grad. *The Globe and Mail*. Retrieved from http://www.theglobeandmail.com/news/national/education/the-expectation-gap-students-and-universities-roles-in-preparing-for-life-after-grad/article21187004/?page=all

Ministry of Education British Columbia. (2010a, February). Standards for K-12 Distributed Learning in British Columbia. *Province of British Columbia*. Retrieved from http://www2.gov.bc.ca/assets/gov/education/administration/kindergarten-to-grade-12/distributed-learning/dl_standards.pdf

Ministry of Education British Columbia (2010b, February). Standards for Digital Learning Content in British Columbia. *Province of British Columbia*. Retrieved from http://www2.gov.bc.ca/assets/gov/education/administration/kindergarten-to-grade-12/distributed-learning/digital_learning_standards.pdf

Ministry of Education British Columbia. (2011, September). Supporting Students with Learning Disabilities: A Guide for Teachers. *Province of British Columbia*. Retrieved from http://www.bced.gov.bc.ca/specialed/docs/learning_disabilities_guide.pdf

Moodle, About. (n.d.). Retrieved from https://docs.moodle.org/29/en/About_Moodle.

Moore, G. E. (2006, September). Cramming More Components Onto Integrated Circuits. *IEEE SSCS Newsletter*, pp. 33, 34, 35.

Mozilla Grants. (n.d.). Retrieved from https://www.mozilla.org/en-US/grants/?type=open-source-technology

Nietzsche, F. (1979). *The Gay Science*. (W. Kaufmann, Trans.). New York, NY: Vintage Books. (Original work published 1882)

Nishnawbe Aski. (2016). History. *Nishnawbe Aski Nation*. Retrieved from http://rschools.nan.on.ca/article/history-3.asp

Oner, D., & Adadan, E. (2011). Use of Web-Based Portfolios as Tools for Reflection in Preservice Teacher Education. *Journal of Teacher Education*, 62(5), 477-492.

Open Source Initiative, About the . (n.d.). In *Open Source Initiative*. Retrieved from http://opensource.org/about.

Ormond, C. G. A. (2013). *Sustainability Education as Teacher Education: A Mixed Methods Study of a Place-based Learning Environment* (Doctoral dissertation). Retrieved from Summit SFU. (etd8083)

Ouédraogo, J. (2005). Africa: Human Nature as Historical Process. In N. Tazi (Ed.), *Keywords Nature: For a Different Kind of Globalization*. New York, NY: Other Press.

Peters, R., & Filipova, A. (2009). Optimizing Cognitive-Dissonance Literacy in Ethics Education. *Public Integrity*, 11(3), 201-220.

Peterson, A. (2015, December 28). Google is tracking students as it sells more products to schools, privacy advocates warn. In *The Washington Post*. Retrieved from https://www.washingtonpost.com/news/the-switch/wp/2015/12/28/google-is-tracking-students-as-it-sells-more-products-to-schools-privacy-advocates-warn/

Phrack Magazine. Retrieved from http://phrack.org/

Pitsoe, V., & Letseka, M. (2012). Foucault's Discourse and Power: Implications for Instructionist Classroom Management. *Open Journal of Philosophy*, 3(1), 23-28.

Pyle, R. M. (2008). No Child Left inside: Nature Study as a Radical Act. In D. A. Gruenewald & G. A. Smith (Eds.), *Place-based Education in the Global Age*. New York, NY: Lawrence Erlbaum.

Ramaekers, S. (2013). The Pursuit of Truth(s) in Educational Research. *A Companion to Research in Education*. 50-61. Retrieved from http://link.springer.com.proxy.lib.sfu.ca/chapter/10.1007/978-94-007-6809-3_7/fulltext.html

Reid, A., & Scott, W. (2005). Cross-Curricularity in the National Curriculum: Reflections on Metaphor and Pedagogy in Citizenship Education Through School Geography. *Pedagogy, Culture and Society*, 13(2), 181-204.

Resources. (n.d.). *First Nations Education Steering Committee*. Retrieved from http://www.fnesc.ca/resources/#

Richards, J. (2000). Reserves are only good for some people. *Journal of Canadian Studies*, 35(1), 190-202.

Ross, R. (1992). *Dancing with a ghost: Exploring Indian reality*. Toronto: Reed Books.

Rousseau, J. J. (1979). *Emile or On Education*. (A. Bloom, Trans.) New York, NY: Basic Books. (Original work published 1762)

Salovaara, H., & Järvelä, S. (2003). Students' Strategic Actions in Computer-Supported Collaborative Learning. *Learning Environments Research*, 6(3), 267-285.

SAGE Computer System. (n.d.). In *History of Computing*. Retrieved from http://www.computermuseum.li/Testpage/IBM-SAGE-computer.htm.

Saul, J. R. (1995). *The Unconscious Civilization*. Toronto: House of Anansi Press Ltd.

Savage, J. (2012). Moving beyond subject boundaries: Four case studies of cross-curricular pedagogy in secondary schools. *International Journal of Educational Research,* 55, 79-88.

Seman, S. A. A., Rashid, W. E. W., & Nasir, H. M. (2012). E-teaching Portfolio Implementation using Mahara Open Source Management System. *Procedia: Social and Behavioral Science*, 65, 974-979.

Simpson, L. (2002). Indigenous environmental education for cultural survival. *Canadian Journal of Environmental Education*, 7(1), 13-35.

Sluijsmans, D. M. A., Prins, F. J., & Martens, R. L. (2006), The Design of Competency-Based Performance Assessment in E-Learning. *Learning Environments Research*, 9(1), 45-66.

Schlottmann, C. (2005). Introduction: Place-based and Environmental Education. *Ethics, Place & Environment: A Journal of Philosophy & Geography,* 8(3), 257-259.

Shklovsky, V. (1917). *Art as Technique*. Retrieved from https://paradise.caltech.edu/ist4/lectures/Viktor_Sklovski_Art_as_Technique.pdf

Shuchman, M. (2013). Bioethicists call for investigation into nutritional experiments on Aboriginal people. *Canadian Medical Association Journal*, 185(14), 1201-1202.

Sobel, D. (2004). Place Based Education: Connecting Classrooms & Communities. Great Barrington: Orion Society.

Sorensen, M. (2008). STAR: Service to All Relations. In D. A. Gruenewald & G. A. Smith (Eds.) *Place-based Education in the Global Age*. New York, NY: Lawrence Erlbaum.

Stadel, B. (2016, April 11). Leap Manifesto: Alberta NDP 'had nothing to do with this nonsense'. In *CBCNews | Edmonton*. Retrieved from http://www.cbc.ca/news/canada/edmonton/alberta-ndp-leap-manifesto-anger-1.3529980

System Administrator's Guide/Requirements. (2015, September 8th). In *Mahara Wiki*. Retrieved from https://wiki.mahara.org/wiki/System_Administrator%27s_Guide/Requirements

Tal, R. T. (2001). Incorporating Field Trips as Science Learning Environment Enrichment - An Interpretive Study. *Learning Environments Research*, 4(1), 25-49.

Tambeau, T. (2011, Mar. 8). Student Feel Unprepared for University Life. *CBC News*. Retrieved from http://www.cbc.ca/news/canada/ottawa/students-feel-unprepared-for-university-life-1.1114699

Tartvijk, J., Wubbles, T., Brok, P., Jong, Y., & Veldman, I. (2003). Designing a Web-Supported Learning Environment on Communications in Multicultural Classrooms. In M. S. Khine & D. Fisher (Eds.), *Technology-Rich Learning Environments: A Future Perspective* (pp. 255-283). London: World Scientific.

Tierney, J. (2013, April 25). The Comming Revolution in Public Education. *The Atlantic*. Retrieved from http://www.theatlantic.com/national/archive/2013/04/the-coming-revolution-in-public-education/275163/

Tobin, K. (1998). Qualitative Perceptions of Learning Environments on the World Wide Web. *Learning Environments Research*, 1(2), 139-162.

Transforming Curriculum & Assessment. (n.d.). In *Building Student Success: BC's New Curriculum*. British Columbia Ministry of Education. Retrieved from https://curriculum.gov.bc.ca/assessment.

Trickett, E. J., & Moos R. H. (1973). Social Environment of Junior High and High School Classrooms. *Journal of Educational Psychology*, 65(1), 93-102.

Tufford, L., & Newman, P. (2012). Bracketing in Qualitative Research. *Qualitative Social Work*, 11(1), 80-96.

Ubuntu. (n.d.). Retrieved from http://www.ubuntu.com/.

Vancouver Hack Space. (n.d.). Retrieved from http://hackspace.ca/wp/.

Vickers, P. J. (2008). *Ayaawx (Ts'msyen ancestral law): The power of Transformation* (Doctoral dissertation). Retrieved from http://dspace.library.uvic.ca:8080/bitstream/handle/1828/1299/AyaawxDec16.pdf?sequence=1

Wagamese, R. (2006). *Keeper'n Me*. Toronto, ON: Anchor Canada.

Walberg, H. J., & Anderson, G. J. (1968). Classroom Climate and Individual Learning. *Journal of Educational Psychology*, 59(6), 414-419.

What is the Open Organization?. (n.d.). In *open source .com*. Retrieved from http://opensource.com/resources/what-open-organization

Wilson, B., & Harris, H. (2005). *Tllsda Xaaydas K'aayygang.nga*: Long, long ago Haida Stories. In D. W. Fedje & R. W. Mathewes (Eds.) *Haida Gwaii: Human history and environment from the Time of the Loon to the Time of the Iron People* (pp.121-139) Vancouver: UBC Press.

Windows 95 Remains most Popular Operating System. (2002, January 2). In *c|net*. Retrieved from http://www.cnet.com/news/windows-95-remains-most-popular-operating-system/.

Woodhouse, J. L., Knapp, C. E. (2000). Place-Based Curriculum and Instruction: Outdoor and Environmental Education Approaches. *Eric Digest*. Retrieved from http://hdl.handle.net/2027/uiug.30112048634130

Wu, J., Shen, Y., Reinhardt, K., Szu, H., & Dong, B. (2013). A Nanotechnology Enhancement to Moore's Law. *Applied Computational Intelligence and Soft Computing*, 2013, 1-13. doi:10.1155/2013/426962

Zandvliet, D. B. (2006). Education is Not Rocket Science: The Case for Deconstructing Computer Labs in Schools. Rotterdam: Sense Publishers.

Zandvliet, D. B. (2012). Development and Validation of the Place-Based Learning and Constructivist Environment Survey (PLACES). *Learning Environments Research*, 15(2), 124-140.

Zandvliet, D. B. (2014). PLACES and SPACES: Case studies in the Evaluation of Post-Secondary, Place-Based Learning Environments. *Studies in Educational Evaluation*, 41, 18-28.

Zandvliet, D. B., & Brown, D. (2006). Framing Experience on Haida Gwaii: An Ecological Model for Environmental Education. *Canadian Journal of Environmental Education*, 11(1), 207-219.

Zandvliet, D. B., & Fraser, B. J. (2004). Learning Environments in Information and Communications Technology Classrooms. *Technology, Pedagogy and Education*, 13(1), 97-124.

Zandvliet, D. B., & Straker, L. M. (2001). Physical and Psychosocial Aspects of the Learning Environment in Information Technology Rich Classrooms. *Ergonomics*, 44(9), 838-857.

Appendix A.

Qualitative Data Catecorization and Comparison - RAW

The data below has been colour coded in order to differentiate between interviews. However, it should be noted that for the Preferred Environment Interview different colours does not necessarily mean different interviewees since the interviews were done twice with each student. However, the Actual Environment Interview colour code does represent both different interviews and interviewees since each colour represents a single interview.

Preferred Environment Interview	Actual Environment Interview
Interview 1	Interview 1
Interview 2	Interview 2
Interview 3	Interview 3
Interview 4	Interview 4
Interview 5	Interview 5
Interview 6	Interview 6
Interview 7	Interview 7
Interview 8	
Interview 9	
Interview 10	
Interview 11	
Interview 12	

Benefit	Benefit
• *Community/Cultural/Experiential Education* ○ Integration of outside into the curriculum (Mossy Bay): "I learn more. More about the foods and all that. The foods we harvest." ○ "Yeah I liked the beach seining. Hiking to mossy bay was cool too." ○ "Um … I feel more connected to my learning outside or using my hands". ○ "Our environment is important because we get our food from out there and so we kinda need it." ○ "Yeah … its kinda like … sorta like our ancestors I guess … learning in Mossy Bay". ○ What is your favourite way of learning: "mmmmmm … I think going out". ○ Student interrupts interview to ask when they are beach seining again. ○ Do you want your learning to be relevant to the Gitga'at culture and territory and your place or do you not want it to be relevant or are you in the middle? "Relevant" So when we are learning about something, say Paris, you want to know how it relates to you here? "Yes" ○ "I was most engaged with stuff like the making the Volcanoes and Mossy Bay" ○ Student indicates that rather then learning from a book they'd rather "go out. Because its better to see the plants and learn about them from an elder." ○ When asked where the student is most engaged: "When we're with elders and learning from them" ○ "Ahhhh … yeah … I like when [the curriculum] is relevant" ○ When the student was asked about learning with outside places like Ottawa or Paris student replied: "Ahhh yeah. A little bit of both" meaning both local and extra-local which is made relevant. ○ When asked where s/he would rather learn: "Out in Mossy Bay". Student interrupted the middle of the question. ○ "Our culture is important cause we are from here and like we need to know so we don't go run off being white." Interviewer asks if this is so the student can preserve her/his cultural legacy and history: "yes … keep it going" ○ "I think I learn better when we are out there learning and not in school with the book because its fun [out there] and when something is fun we want to do more of it." Student indicates s/he retains more when learning outside:	• *Community/Cultural/Experiential Education* ○ Student indicates that their classroom experience has been "positive" because "yes" it has been relevant and focused on their place in a multitude of ways. ○ Student feels that technology, experiential and place-based learning has "been a good thing, yes". ○ Student indicates that "yes" technology integrates well with place-based and localized education. ○ Student indicates that "yeah" technology has helped her/him to understand their place and environment better.

	"like one was tube fish … it looked like grass". Student indicates s/he probably would not have remembered that if it was from a book. ○ Student indicates when s/he learns best: "um … mostly when we are outside" ○ Student gets excited to name the fish s/he learned about while beach seining in Mossy Bay: "Pipe fish … they looked like grass and um … bull heads and um … there was ahhh eels and ahhh …. there's those little chum … and … I forgot" ○ Student is asked what would be most relevant to them: "Ice Cream and drawing". Student probed a bit further and asked about Mossy Bay: "Oh yeah and that" ○ Student asked when they pay most attention and cut interview off with: "Mossy Bay" ○ When student was probed about what they learned in Mossy Bay responds: "A little bit … the tube ones and flounder … the tube ones look like grass and when you curled the tails they looked like sea horse", student asked where flounder stay, what they look like and why they might look that way: "flat sand … their bottom looks white and the top looks sand [sic] … [I think] so it could hide itself". ○ Student indicates s/he wants the curriculum to be relevant to his/her territory and culture. When asked about going outside and learning in places like Mossy bay student says: "well actually … um this that was a new thing for me like for like in my school there [Prince Rupert Middle School] they would give you a book and say ok your going to be …. ok we're going to be doing this there and they give you a textbook but when we went out I'm like this is something new". When asked about her understanding of fish habitat student responded: "I remembered it more than just a textbook". Student also indicates learning much more "relevant". ○ When asked about then s/he is most engaged student says: "i like um doing the ahh field there where like you get really into it there because i'm not a person that just doesn't like doing quizzes on PE day so i like just like ok i'm done and I go outside … i … for like … i do participate but i don't participate that much in school like if it is not like involving [experiential learning] I won't really do it … i'm more engaged with like doing it and like seeing it for myself than like writing it	

down on paper" ○ Student indicates that s/he would rather be "going out into the environment here" than learning through books which are more centred around major metropolitan areas. ○ Student feels having learning localized to their place and culture is very important. ○ Student indicates that localized place-based curriculum is of the utmost importance and that s/he "wouldn't want any of it [textbooks / curriculum from outside the community]" ○ Student indicates that s/he would much rather have a curriculum localized and place-based "here in Hartley Bay".	
• *Western Industrialized Education*	• *Western Industrialized Education*
• *Student Cohesion* ○ What would help you come together more: "Games. I was just joking about that one but we used to play Man Hunt. Sometimes we fought because some people cheat. Cause if you catch them they will say 'no you let go'. You're suppose to say 1 2 3 Man Hunt. It stopped when [names student] left." ○ When the student was asked about discussing their ideas with other students student responded: "Yes. I like doing that." ○ When student was asked about working in a group or alone: "better. I want to go with the group." ○ yeah i wouldn't mind having other students ask me questions but you know if they correct me i'm like "ok" … "ok then" but i wouldn't mind having the students ask me questions telling me like asking like why did i choose this or how come.	• *Student Cohesion* ○ Student indicates that "yes" technology has allowed her/him to interact with students better. ○ When asked if s/he felt s/he has been able to negotiate with students in the class student responded with: "200% … heh … I mean 100%" ○ Student feels that "yes" technology has allowed her/him to interact with students better. ○ Student indicates that "yeah" technology has allowed him/her to interact with students in different and positive ways.
• *Student Teacher Negotiation/Autonomy/Control* ○ Student thought they had a lot of control over the space lesson. Talked a lot about the space assignment. ○ "I feel pretty good about sharing my ideas about what we should do and all" ○ Student indicates that s/he thinks its ok, and wants to, share his/her opinion in class. ○ "actually I wouldn't mind being heard from the teacher that there so that they know my ideas i want to give them some examples or like correct them so i like want them to know and i want to have my voice heard in class and not just be there to learn."	• *Student Teacher Negotiation/Autonomy/Control* ○ "I think it was me and [student] who suggested [a camping space astronomy telescope night]" which the teacher did; moreover the student indicated: "Well I liked that". ○ Student indicates that "yeah" s/he has experience shared control in the class room. ○ Student felt that "in the videos and stuff yeah" they had a lot of open-endedness and shared control. ○ Student thought they had shared control and openendedness "when we made the dedication video for the graduates, the sour video … um … the camping experience …. and … there is also the volcanoes" ○ Student she likes openendedness because "I like doing my own thing".
• *Technology and Culture* ○ When asked about recording elders and promoting their culture through	• *Technology and Culture* ○ Student feels that that using media arts technology

digital media student responded: "its supporting so then like you can keep it there and like show people how the culture is and like … why its so important to these people" ○ Student feels technology can benefit his/her culture because "when I have kids and just make sure they know all about this place" through digital media. ○ Overall student sees technology as a net benefit to his/her culture. ○ Student saw technology as a benefit when used appropriately to benefit their culture. ○ Student read a book on Culture Jamming and things something like this would "probably benefit" their culture.	(video/audio/photography) has allowed her/him to express him/herself in new ways. Usually the student would "probably just tell the teacher" but can now show the teacher and "yeah I think its been positive" ○ When asked if technology has allowed him/her to express, understand and interact with her/his culture better student responded emphatically: "yes". One of the most significant parts was "recording the elders". ○ Student indicates that "yeah" technology has allowed them to express her/himself in new and better ways. ○ Student indicates that "yes" technology has helped him/her to understand her/his culture and place better. ○ "Yes. I think I can express myself better" with technology and that s/he will "probably" continue doing video/photography work in the future. ○ Student was very positive about how s/he could use technology to impact their culture. ○ Student believes that "Yes" technology has allowed him/her to express herself in new and better ways. ○ Student indicates that "yeah" technology has helped her/him out culturally.
• *Technology and School Work* ○ That was fun doing the play dough and the volcano. Building them. ○ "I was most engaged with stuff like the making the Volcanoes and Mossy Bay" ○ When asked about having an online environment so students can reflect on their work: "i wouldn't mind that. like having there on computer there and like when i'm older i go back and i'm like cool look what i did. i wouldn't mind it … yeah i would like that there where I feel like i did really really good and i tried my best and like um i accomplished it what i was suppose to do" ○ When asked about having other students look at their work online: "i wouldn't mind it cause then then i feel like a role model and show them what i did maybe i can help them, but if they take my whole work i'd probably be like 'I'm not going to put that up again'". ○ Overall the student felt that the online tool was "a benefit tool [sic]" ○ Having students see their work: "Yeah I think it would be [a good thing] just to show each other how hard we have been working". ○ When asked if they would like a place where they could see what they have done over the year: "I'd want to see it	• *Technology and School Work* ○ "I think the website [Mahara] has been a positive experience". Student further indicated that it was easier to do assignments. ○ Student indicates the following about their class experience and technology: "I think our … I think its gone up." This was in part due to the learning curve but now "yeah … its better" since we understand. ○ Student indicates that technology overall has been a benefit: "Yeah. It has helped me understand the materials better". ○ Student feels that "yes" once the class understood the technology better their learning experience also increased. ○ Student indicates that "yeah" their experience of technology improved once they understood how to use it. ○ "I think [technology has] been good for the class" and "yeah" for the student as well. ○ When student was asked why the class's experience was rated higher than their expectations student replied: "probably because they like working on it". ○ Student felt that "yeah" it was much easier to work on and with computers, Mahara, video cameras, iPads, etc. ○ Student was asked why the class's

… just see all the work I've done in the past". ○ Student sees Mahara as a benefit to his/her education. ○ Student indicates that, while s/he does not like other students looking at her/his work, "yes it would be a benefit" to view other students work which could help you on the assignment. ○ Student indicates that the overall online environment is a "benefit" and that it makes learning easier to go "online". ○ Student indicates that Mahara makes them "more able" to do work because s/he can access if from home or anywhere. ○ Student indicates that they like having a place to reflect on their work. ○ Student feels that it benefits them to see other students work. ○ Student indicates that using technology to promote their culture through elder interviews and local cultural creation is a benefit to their culture. ○ Student feels that the technology used in the classroom, iPads, Cameras, video, websites, etc. was an overall benefit to their education. ○ Student indicates that Mahara and the online environment is beneficial "because if we have homework we can do it if we go away [on the ferry to Prince Rupert] and stuff like that." ○ Student indicates it is a beneficial to see other students work to help their own. ○ Student indicates that the online environment like Mahara and Google have been beneficial for the student's education. Student used the example of looking up a word definition, "because looking through the dictionary is hard and it takes too long" ○ Student indicates that accessing their work from anywhere with Mahara/Internet is an emancipatory tool "because like if you go to like [Prince] Rupert you can still work or if you are home sick" ○ Student feels it would be positive to see their work in one place so s/he can reflect on their growth. ○ Student indicates s/he would much rather work "online" because "I don't like writing" indicating the student struggles with hand writing.	experience was rated right than their expectations and student replied "because we actually did it and it was actually fun using the cameras and stuff." ○ Student also felt that "Yes" once they learned the technology it became easier and thus had a better learning experience. ○ Student thinks that students rated their experience of technology better than their expectations "because they like the iPads and stuff more". ○ Student indicated that technology usage has created a "good" learning environment. ○ Student was asked why their experience was better than their expectations and student responded: "maybe because its funner and better [sic]". ○ Student feels like "yeah" it is easier for him/her to express themselves on technology.
Neutral	**Neutral**
• *Community/Cultural/Experiential Education* ○ Always learning about	• *Community/Cultural/Experiential Education*

cultural/community things or other things: “Both. I like to learn about here and other places.” ○ Student feels they would rather only look at the Gitga’at cultural elements of Mossy Bay than the science elements. ○ Student doesn’t say much but indicates s/he “sometimes” wants to learn about his/her culture or other places.	
• *Western Industrialized Education* ○ Student was asked about what could make the traditional educational environment better: “I don’t know … I would have to think … um … possibly something … breaking at it for 10 minutes. [laughs]”. ○ If the student had to learn about the fish they learned about in Mossy Bay through Beach Seining in a traditional way would s/he have remembered anything and student said: “some” but not as vividly.	• *Western Industrialized Education* ○ Student indicates that both traditional classwork and field/technology work have worked together in expanding her education and understanding of place: “Um … my experience was … well … I don’t know which one they are both … I’d say 50/50”. When asked about what his/her experience has been in the classroom within regards to technology, field and traditional work in relationship to place student responded: “yeah, [we] have done plenty of that”.
• *Student Cohesion* ○ Working with other students: “I don’t know. Depends on what students” ○ On helping students: “because when you explain something to them and you tell them and then they are going to ask you what you said again and then you have to keep on doing that. ○ “I don’t like explaining my ideas to other students … well sometimes I do … I don’t know … because I’m afraid people won’t like my ideas.” ○ When asked what might stop the student from discussing their ideas: “Shyness. I get really shy.” Student was probed further on this and asked why s/he would be shy since everyone in her class is like family: “Heheh … yeah … I don’t know … its kinda funny I guess … but I just am.” ○ “I work best in the group … well it depends on who we are working with”	• *Student Cohesion* ○ Student felt that technology “sort of” allowed students to interact better.
• *Student Teacher Negotiation/Autonomy/Control* ○ Do you like to just be told “Hey this is where you go” or do you want to be more in control: “mmmmmm … a little bit of both”. ○ When talking about student control and negotiation: “Most of mine were in the sometimes right there”. ○ You want to have a say but don’t want to run the classroom: “yes” ○ Student sometimes wants to have control but other times does not. ○ When the student was asked about having either structure/control or open-endedness the student replied: “Kinda a bit of both”. ○ “Ahhh … 50/50 … I want to say this is what we are learning about and you telling us what we are learning about”.	• *Student Teacher Negotiation/Autonomy/Control* ○ Student indicates that their Critical Voice and student teacher negotiation has been “50/50”. ○ Student indicates that s/he only “kind of want” a Critical Voice. ○ Student indicates the following about shared control: “I think its been a positive thing for us” but that s/he only values/wants it “50/50”. ○ When asked if students have ever presented ideas to the teacher and the teacher does them student responded with: “sometimes” ○ Student indicates that some structure along with openness is good or “I would probably do nothing…” if it was too open ended. ○ Student indicates they like to have a

○ Student indicates their position on having a critical voice and classroom control: “sometimes … most of the time yeah … but sometimes no … its good to have the teacher” ○ Student indicates s/he felt that s/he had control over the “Space Unit”. ○ In relationship to shared control student says: “um … I want some control.” Student indicates they want to give ideas about what to study but then have the teacher design the lessons. ○ Student indicates s/he only wants some control in the classroom. ○ “yeah … i want some direction to tell me like who … like whats going to happen whats going to do i don’t want the teacher just to say ok you guys negotiate and you do this and i’ll be right over here waiting until you guys are done i’m like “NO” i want you to like [direct us].”	say in the class but also likes things “outlined”. ○ When considering why students rated their experience of shared control and openendedness as worse than their preferred student responded: “maybe because we thought it would have been fun and then when we actually did it we thought it wasn’t fun.” ○ Student indicates that “sometimes” they have been able to have control over what they learn.
• *Technology and Culture* ○ When asked about technology as benefiting indigenous culture student responded with: “no i don’t see that because like um … the whole point of it there [Kiel] is to go there for like um sea weed picking and other hunting there but if we have wifi and that there no one is probably going to go up no one is probably going to stay .. they are going to stay in maybe … watch tv … maybe go on Facebook youtube so like maybe like i don’t really want really wifi but it is helpful sometimes to see what this … like … mine is a positive slash negative its like we can go on to the um google there and search out this plant there that we don’t know of and see if its like poisonus or is it fine or we can like see how we can get rid of animals that are like 10 feet away from you” ○ Student feels technology is a double edged sword. ○ Student felt technology and place-based education can work well together if done properly: “i think they work pretty well together so then we can experience that there but like. um … i wouldn’t mind doing it the traditional way because the electronics kind of take over a bit but i didn’t mind taking pictures like video taping it measuring and checking the water out.” ○ When asked if technology supports her/his culture student responded “not that much … but still … sort of a lot”	• *Technology and Culture* ○ “Technology is great but it is not really good cause most kids play on their iPads and stuff yet they need to be playing outside they should be playing it on a rainy day or windy or when there is thunder and lightening.”
• *Technology and School Work* ○ When asked about accessing your work from anywhere student responded “there’s a benefit. I just	• *Technology and School Work*

	don't like the benefit." ○ mmmm not not … well yeah sometimes yeah but like … but like i don't want to have like um … like they tell me i can search up anything like i can go on anything there to find out my questions … i'd be like soooo i can search up anything i can go on the internet and find cheat sheet. i'm like no i'd rather use a book and find it myself but i don't mind it like if it is a hard questions I will intentionally use like um anything there I can ○ When asked about the benefit of being able to access the student's work from anywhere student said: "Um … yeah I think I want that sometimes" ○ Student views online technology in general as "sorta half and half" good. ○ Student, when asked about easy online access to her/his work s/he pointed to a "3" on the Likert scale. When asked why only a 3 student responded "cause I might go crazy if I always had access to my homework". ○ Student responds to the idea of accessing your work from anywhere: "I don't like it but its probably better" because s/he is more accountable. ○ Student indicates that "I don't like [having other kids see my work]" because "I don't like being wrong" but that overall its "probably good" to have students see eachothers work. ○ Student says being able to access your stuff from anywhere is both good and back "cause sometimes you wanna see how much work … like you want to let them see how much work you have done but then if you don't do the work they see your not doing anything" ○ Student wants "both" an online and traditional school environment to work together ○ Student feels that Parent access is "both" good and bad: "um … the benefit is when they get to see your good work and the bad thing is if … umm … your not doing your work" ○ Student indicates parents accessing work online is both good and bad. ○ Student indicates there is "sort of" a benefit to looking at other students work in order to help them and learn. ○ Student thinkgs technology is "both" a benefit and hinderance to his/her culture: "I don't know. Like most people stay in and watch TV and instead of going out and learning all the cultural stuff." Studen indicates that "some technology would be good for somethings [and] be a benefit" when it is used to promote their culture on the internet, record elders and history for	

future generations or get baseline science data like our Stream Flow recordings. ○ Student feels the technological benefit for her/him is a "middle" benefit in his/her education.	
Hindrance	**Hindrance**
• *Community/Cultural Education* ○ When asked about integrating the community and environment student responded: "I don't want to go outside and learn about like science. I want to learn about our history. Not sciencey stuff and other people's history". Student was probed on this and asked what about learning about the science of plant life in mossy bay isn't your history, student responded: "I want to learn about like our … like just … not school stuff just … um … i don't know what the word is … i just want to learn about … like with nothing … like just from like elders telling us stories and all that i don't want to learn about what the river flow is or any of that sciency stuff. I just don't think I'm ever going to use that when I'm older." Student was further asked if he felt their community could use that science information at some point in the future: "no". After a discussion about correlating salmon spawning with river flow levels the student conceded that some science might be "remotely" relevant. ○ When asked where we should be studying marine biology student responded "I think we should go to the [Vancouver] Aquarium to learn about that." And indicated you should not do it locally because "I like going to the Aquarium". When asked which would benefit her/his culture more: "oh … learning about it here".	• *Community/Cultural/Experiential Education* ○ "When talking about place-based field work: "I just don't like when it is hot out and the bugs are bad because that always happens whenever you take us outside."
• *Western Industrialized Education* ○ "Learning about our traditional foods or plants from books would be boring. I'd hate it." ○ Student didn't like doing the book work around volcanoes but liked building them. ○ "I don't like book work because it takes up your time and its boring and when I'm bored I get distracted." ○ "I don't want to pay attention". Student was asked what would get them to pay attention more: "Learning outside". ○ When asked about learning in the classroom student makes a face and points to a five and says "right there".	• *Western Industrialized Education*
• *Student Cohesion* ○ I want students to get me to explain	• *Student Cohesion* ○ Student indicates that using the

my ideas: “I wouldn’t like that one though … I don’t know … I just don’t really like being asked questions.” ○ Asking questions does it make you nervous, kinda like anxiety: “Sometimes yes. I’m afraid of being wrong”. Student also says s/he is not afraid of what other students might say about her/his thinking. ○ Group Cohesiveness: “I would only help like two people. Only those two people are boys. So it would be three people if [names student] was still here.” ○ “I don’t really talk to them [female students]” ○ When working with students in a group: “I find it less easy to do. Like when you put us into groups of four [names students] and then [two specific students] won’t talk to each other [because they] don’t like each other. Because they don’t really work and they don’t really talk and when we put them together and try to make them try work they don’t really do anything … that what would happen”. ○ Student indicates there is nothing that could be done to increase her/his desire to share more in class. ○ “Um … I’d want to speak your [sic] mind but I wouldn’t want to get judged for doing that … sometimes I feel judged I guess. I don’t know … just the feeling comes and goes.” ○ When student is asked about sharing their ideas to other students: “I feel nervous that they are not going to like my idea”. Student indicates feelings of judgment. ○ When asked about working together in a group student responds: “I barley work” ○ Student indicates s/he has no desire to share ideas: “no … I just don’t like talking boring stuff [sic] … I’d talk about ice cream and drawing”. ○ “i’d rather work alone … because I don’t like working with other kids that much because they get me off track sometimes they um fiddle around with what we are suppose to be doing so i’m like OK i’ll just do it by myself … yeah it distracts me and then i don’t get my work done on time so i’m like no i’m going to work by my self”	video/audio/photography and other technology has not allowed him/her to interact better with students. ○ “Yeah … we are not really good at sharing. I don’t know … people don’t share with me and I don’t share with them. I don’t share with them and they don’t share with me.” ○ Student feels that technology has not allowed student to interact better: “No … I think they get distracted on it.”
• *Student Teacher Negotiation/Autonomy/Control* ○ Student felt they had no control over the Reading Journal Assignments. ○ When student is told they are helpful in class: “That’s because I want to get an A”. When pushed about intrinsic value vs reward value student indicates s/he is somewhere in between. ○ “Yeah I’d just like to study what we	• *Student Teacher Negotiation/Autonomy/Control* ○ Student indicates that they don’t want openness and negotiation but rather “structure and an outline” because its “easier” and if it was openended “I woudn’t do nothin’ [sic]”. ○ Student indicates s/he like the teacher “to give the work” otherwise “yeah … I’d probably not do much” if it was too

want basically without the teacher … I don't want any teacher control." ○ "I want to have more control than you in the classroom" ○ Student indicates doing assignments s/he "hates" makes him/her feel less in control. ○ "i'd rather be told like so … cause when i do it on my own i get kind of distracted and i also forget what i'm suppose to do i ask a lot of questions so like i like it better when i'm told what to do when and how its suppose to be done"	openended.
• *Technology and Culture* ○ When asked if the student felt using the iPads, Mahara, Internet and other technology student responded: "Not a benefit to our culture because in our culture we never used stuff like that." When asked if that technology was used to record elder history and create local culture student responded: "I don't know". ○ When student was explained what "the monoculture" is student agreed that is the worst part of technology. That it washes out their culture. ○ Student sees technology as a distraction "cause you just get stuck inside playing" and it doesn't reflect their culture; but was quick to point out that "I love technology" ○ Student indicates that "you pay more attention to the technology than our culture sometimes" and that they are at risk of "forgetting the culture" ○ Student indicates that technology is "not benefit [sic]" to her/his culture "cause kids need exercise instead of technology [and] we didn't have technology when we were in …. way back then" and feels technology detracts from connecting with their culture. Furthermore, the student thought it was better to write elder's words and ideas down than record them. Student felt there was no culturally beneficial technology.	• *Technology and Culture* ○ Student thinks a problem is "kids are going to grow up fat".
• *Technology and School Work* ○ "I didn't feel engaged with making volcanoes or Mossy Bay or anything really" ○ When asked about the website student responded "I don't like the website because its not good … like it doesn't have auto correct … like it doesn't … its just not good …" ○ Student indicates that a hindrance is that students "can't practice our printing". ○ "I don't like looking back at my work once it is in the past. I don't want to see it again. It disgusts me." When the student was asked to explain this	• *Technology and School Work* ○ Student felt that "I never use the camera" and this produced a poor learning experience. ○ When asked why her/his learning experience differed so much from the other students s/he replied: "I don't know … I just don't like it … I like technology … you make it boring … You just don't let us do what we want to do on technology. I would just do my own thing". When asked what that the student's own thing would be student responded with: "I can't answer that because we are in an interview". When pushed on this and asked to

	further s/he responded “because I hate doing work … work is the worst”. ○ “um … like if you gave me a textbook online i wouldn’t mind it but i would like get distracted because its electronic and i will go on anything so like i don’t like to use that much computers i don’t like to use electronics when i’m doing work. its distracting for me there so like what if i go on to the internet and go on youtube i listen to youtube more and then i don’t do my homework and then i get in trouble” ○ When asked about parents/guardians being able to go on and see what they are doing student responds: “well i wouldn’t mind them going online to see what i’m doing but um like they usually ask if they can see what i’m doing but like they would invade my personal privacy so i’m like ok … like if they keep an eye on me then they see what i’m doing and they like i like come downstairs and they are like “[students name] why aren’t you doing your homework” and i’m like ahhhh” ○ When asked about the ability of parents using the online tool student didn’t like that idea “cause they will probably get mad at me if I don’t have much done”. Student did admit that it would keep them more accountable. ○ Student sees technology as a distraction when it doesn’t work or when s/he can go onto YouTube or Twitter. ○ Student indicated that they start “playing games” when they go on the internet suggesting that the internet can be distracting. ○ Having a parent be able to access their work was seen as detrimental to his/her freedom. Student responded: “I don’t know … cause I probably would have to work more” ○ Student indicates that s/he has not interest in reflecting on his/her work “because its boring.” Moreover, student feels it is a “bad thing” to have her/his parents reflect on their work. After a bit more conversation the student was re-asked if s/he saw absolutely no benefit in reflection and parents viewing and the student answered: “I do … but I don’t … sometimes … it’ll get me to work more I guess”. ○ When student was asked about Parent Access s/he replied: “I don’t like that” because it meant s/he had to do more work. ○ Student indicates that s/he does not like to reflect on his/her work but just likes to “forget about it”. ○ Student indicates that “we get	contextualize the technology usage within the context of a school and learning environment student admitted “yes” technology is “kind of positive”.

	distracted … like some of us look at different things when we are suppose to be on the site [Mahara] … like not me but I catch other people" ○ Student indicates that at home s/he will attempt to do an assignment on Mahara but will then start going on Tumblr or YouTube. ○ Student feels that s/he would not want other students to see their work because it is "scary". ○ Student indicates s/he would rather "forget about it [previous work]" rather than reflect on it "because its too much to remember … I don't want to remember but if I keep my work I probably will". When asked why the student doesn't want to remember her/his work: "because then you can think about new stuff like what to do with your like colleges [sic] if you graduate". Student was further asked if it would be a benefit to be able to see their work improve over time as a motivational tool: "Sort of" ○ On other student access to work: "I don't really like other people looking at my work … except for the teacher though"	

Appendix B.

Survey Quantitative Data - RAW

	Relevance/Integration
Mean - Preferred	2.85
σ - PF	1.188621266
Mean - Actual	2.514
σ - AC	0.781078763
p-value	0.148435063

	Statement / Question	**Preferred**	**Actual**
1	{I want to / I} learn about my local environment.	2.875	2.714
2	{I want my / My} new learning to start with ideas important to the local environment.	3.625	3.000
3	{I want to / I} gain a better understanding of the environment and places outside of school.	2.750	2.285
4	{I want to / I} learn interesting things about the environment outside of school.	2.500	1.714
5	{I want my lessons to be / Lessons are} supported with field experiences and other field-based activities.	2.500	2.857

	Critical Voice
Mean - Preferred	2.625
σ - PF	1.294713115
Mean - Actual	2.857
σ - AC	0.974463869
p-value	0.379922699

	Statement / Question	**Preferred**	**Actual**
1	{It would be / It's} all right for me to ask the teacher "why are we learning this?"	2.125	2.285
2	{It would be / It's} all right for me to ask for a better explanation of learning activities when I need one.	3.125	2.714
3	{It would be / It's} all right for me to request fewer interruptions that interfere with my learning.	2.750	3.000
4	{It would be / It's} all right for me to express my opinion.	2.500	2.857
5	{It would be / It's} ok for me to speak up for my rights.	2.625	3.428

	Shared Control
Mean - Preferred	2.975
σ - PF	1.165475582
Mean - Actual	3.9428
σ - AC	1.10992467
p-value	0.00022244

	Statement / Question	**Preferred**	**Actual**
1	{I want to / I} help the teacher plan what I'm to learn.	3.000	4.285
2	{I want to / I} help the teacher to decide how well I am learning.	3.125	3.857
3	{I want to / I} help the teacher decide which activities or projects are best for me to work on.	2.625	3.571
4	{I want to / I} help the teacher decide how much time I spend on learning activities.	3.000	4.428
5	{I want to / I} help the teacher decide the activities I do.	3.125	3.571

	Open Endedness
Mean - Preferred	2.75
σ - PF	0.980580676
Mean - Actual	3.4571
σ - AC	0.816839575
p-value	0.000537827

	Statement / Question	**Preferred**	**Actual**
1	{I want to be / I am} able to go beyond regular learning activities and do some study on my own.	3.375	3.714
2	{I want to be / I am} encouraged to think for myself.	2.000	3.285
3	{I want / There are} opportunities to pursue my interests.	2.875	3.142
4	{I want to / I can} design my own learning projects.	2.500	3.714
5	{I want to be / I am} able to express myself freely in my learning.	3.000	3.428

	Group Cohesiveness
Mean - Preferred	2.425
σ - PF	1.195879678
Mean - Actual	2.54285
σ - AC	1.038745203
p-value	0.32460331

	Statement / Question	**Preferred**	**Actual**
1	{I want students to / Students} get along well as a group.	2.125	2.714
2	{I want to build / I have built} better relationships with other students.	2.750	2.714
3	{I want / I feel} students in this class {to support / have supported} each other and {to develop / have developed} stronger community dialogue.	2.250	2.571
4	{I want students to / Students have gotten} to know each other well through participating in activities.	2.750	2.285
5	{I want to be / I am} able to depend on others for help during classroom activities.	2.250	2.420

	Student Involvement
Mean - Preferred	3.175
σ - PF	1.034965626
Mean - Actual	2.9428
σ - AC	0.968408553
p-value	0.159606413

	Statement / Question	Preferred	Actual
1	{I want the teacher to / The Teacher} ask(s) me questions when we are learning.	3.625	2.714
2	{I want to / I} ask the teacher questions when we are learning.	3.000	2.571
3	{I want my / My} ideas and suggestions to be used during discussions.	3.375	3.142
4	{I would want to / I} pay attention.	3.000	2.714
5	{I want to / I} offer my opinions during discussions.	2.875	3.571

	Student Negotiation
Mean - Preferred	3.2
σ - PF	1.017790468
Mean - Actual	3.1428
σ - AC	1.061155229
p-value	0.406620794

	Statement / Question	**Preferred**	**Actual**
1	{I want to be / I am} provided with opportunities to talk with other students about how to solve problems.	2.750	2.714
2	{I want to / I} make an effort to explain my ideas to other students.	3.125	3.285
3	{I want to / I} ask other students to explain their ideas and opinions.	3.000	2.174
4	{I want / Other} students to ask me to explain my ideas.	4.125	3.428
5	{I want other / Other} students {to be / are} provided with opportunities to explain their ideas to me.	3.000	3.571

	Environmental Interaction
Mean - Preferred	2.9
σ - PF	1.081309747
Mean - Actual	2.8571
σ - AC	0.87926631
p-value	0.425238606

	Statement / Question	**Preferred**	**Actual**
1	{I want to be / I am} more engaged during field trips.	2.375	2.428
2	{I want to be / I am} able to express myself freely during field experiences.	3.375	3.000
3	{I want learning which / Learning} is important for me during our field experiences.	3.000	3.000
4	{I want to / I} put a lot of effort into the learning activities during our field trips.	3.000	2.857
5	{I want to / I} spend most of the time during field local trips learning about my environment.	2.50	3.000

	Emancipatory Activities
Mean - PF	2.9
σ - PF	1.007662947
Mean - AC	2.742
σ - AC	0.950011057
p-value	0.244737847

	Statement / Question	**Preferred**	**Actual**
1	{I want to be / I have been} able to access my school work from anywhere.	3.000	2.571
2	{I want an easy way / It has been easier} to show my parents/relatives/guardians what I am doing at school.	3.125	2.571
3	{I would like to not have to / I have not had to} carry school materials to and from school.	2.875	3.000
4	{I would like to have / I have liked} more content online so I do not loose my materials.	3.125	2.572
5	{It would be great to have / I have liked having} a place which clearly outlines what I am suppose to do for the class.	2.375	3.000

	Co-Participatory Activities
Mean - PF	3.05
σ - PF	1.036512892
Mean - AC	2.742
σ - AC	0.741336517
p-value	0.070506139

	Statement / Question	**Preferred**	**Actual**
1	{I would like / I like having} a place to reflect on the work I have done.	2.750	3.00
2	I feel that being able to see other students work {would / has} help my work.	3.125	2.714
3	I think having other students give me comments and view my work {would / has} help me perform better.	3.500	2.857
4	I think it {would be / has been} easier for me to comment on a student's work, and course content, online rather than face to face on in class.	2.625	2.571
5	I {would like / like to} a place where all students could show their work and participate in discussion.	3.250	2.571

	Student Benefits
Mean - PF	2.925
σ - PF	1.118320627
Mean - AC	2.685
σ - AC	0.795998395
p-value	0.142597965

	Statement / Question	Preferred	Actual
1	I {would like / like having} a place where our class can be supportive each other.	2.625	2.714
2	I believe an online and computer environment {would help / helps} me perform better than a paper environment.	2.750	2.714
3	I think a web-based and computer learning environment {would hold / holds} my attention better than a pen and paper learning environment.	3.250	2.857
4	I think I {would be / am} less bored in class, and doing homework, if I could do it on a computer based system.	3.125	2.571
5	{I want an / The} online computer based environment which is easy to use.	2.875	2.571

	Information Structures and Design Activities
Mean - PF	2.975
σ - PF	0.973692417
Mean - AC	2.8
σ - AC	0.719476934
p-value	0.187707

	Statement / Question	**Preferred**	**Actual**
1	{I want the / The} learning objectives of each lesson clearly stated and accessible.	3.125	2.857
2	{I want / The} learning resources easily accessible and clearly connected to the learning objectives.	2.750	3.000
3	{I would like / I believe the} multimedia content which enhances the learning environment.	3.250	2.571
4	{I would like / The} expectations of assignments to be clearly stated in a web-based environment.	2.750	3.000
5	{I want / I feel the} classroom activities to be easily put into the web-based computer portion of the class environment.	3.000	2.571

	Indigenous Culture
Mean - PF	2.775
σ - PF	0.891196257
Mean - AC	2.828
σ - AC	0.821967306
p-value	0.393687664

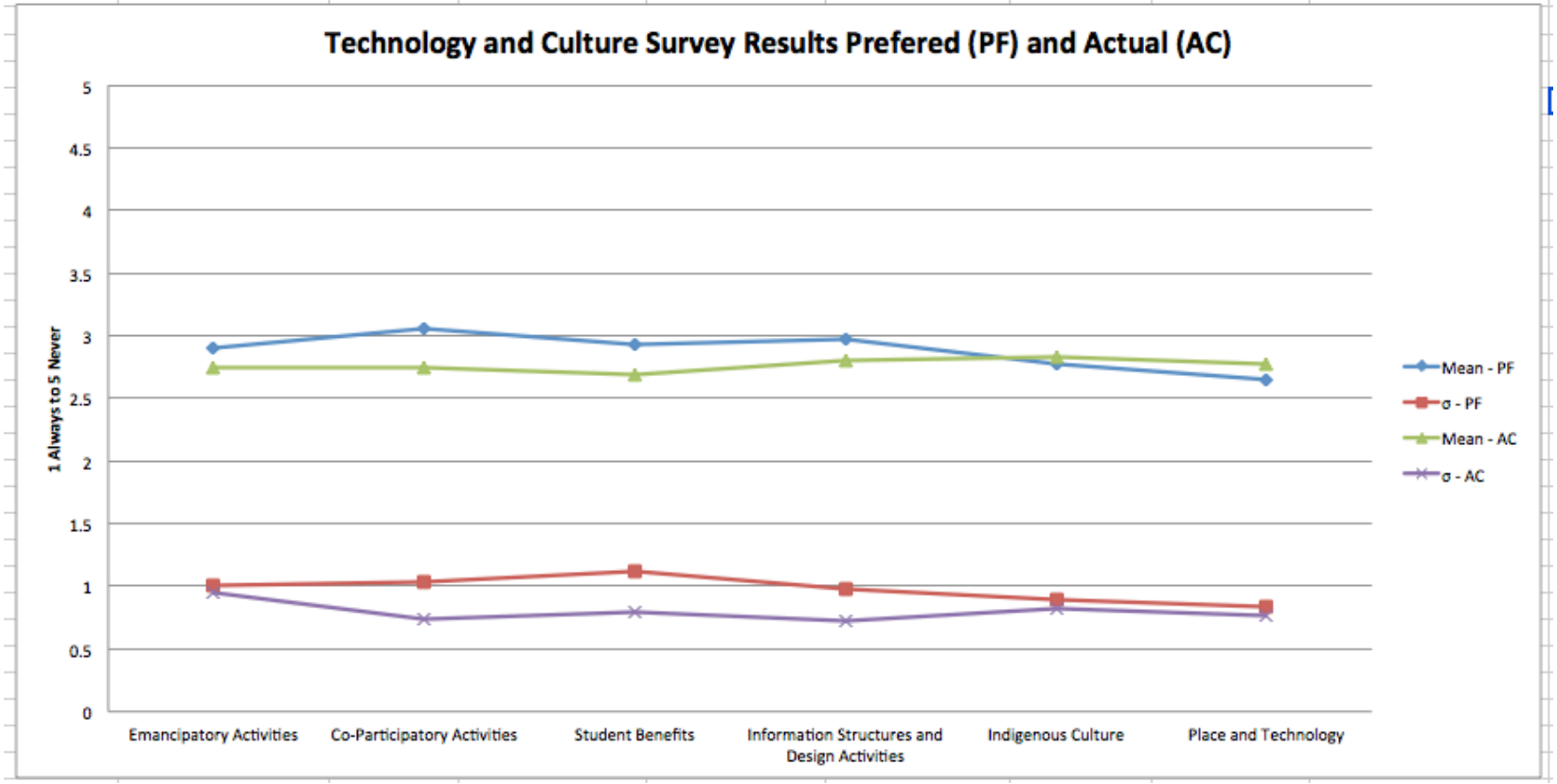
	Statement / Question	**Preferred**	**Actual**
1	{I want my / My} traditional culture reflected in all the subjects I learn.	3.000	2.714
2	{I want my / My} classroom activities to help create and build my traditional culture.	2.750	2.428
3	{I want to learn / Learning} ways to use technology {to help / has helped} build and strengthen my cultural heritage.	2.250	2.571
4	{I think learning / Learning} about other cultures {will help / has helped} me understand my culture better.	2.625	2.857
5	I consider popular culture from Hollywood to also be part of my culture.	3.000	3.571

	[Place] and Technology
Mean - PF	2.65
σ - PF	0.833589704
Mean - AC	2.771
σ - AC	0.770244968
p-value	0.257126633

	Statement / Question	**Preferred**	**Actual**
1	Being able to digitally post what I learn about my local environment {will help / has helped} me understand it better.	3.000	2.571
2	Using cameras, video and audio, {I will be better able / has helped me} to make sense of the place I live.	2.125	2.857
3	Having an environment where I can communicate to the world about the place I live is important to me.	2.500	2.571
4	Part of appreciating the place I live in is being able to make creative responses to it.	2.875	3.142
5	Using technology to do research about the place I live {could be / is} beneficial.	2.750	2.714

PLACES Survey Results Prefered and Actual

	Relevance/Integration	Critical Voice	Student Negotiation	Group Cohesivness	Student Invovlment	Shared Control	Open Endedness	Environmental Interaction
Mean - PF	2.85	2.625	3.2	2.425	3.175	2.975	2.75	2.9
σ - PF	1.188621266	1.294713115	1.017790468	1.195879678	1.034965626	1.165475582	0.980580676	1.081309747
Mean - AC	2.514	2.857	3.1428	2.54285	2.9428	3.9428	3.4571	2.8571
σ - AC	0.781078763	0.974463869	1.061155229	1.038745203	0.968408553	1.10992467	0.816839575	0.87926631
p-value	0.148435063	0.379922699	0.406620794	0.32460331	0.159606413	0.00022244	0.000537827	0.425238606



Technology and Culture Survey

	Emancipatory Activities	Co-Participatory Activities	Student Benefits	Information Structures and Design Activities	Indigenous Culture	Place and Technology
Mean - PF	2.9	3.05	2.925	2.975	2.775	2.65
σ - PF	1.007662947	1.036512892	1.118320627	0.973692417	0.891196257	0.833589704
Mean - AC	2.742	2.742	2.685	2.8	2.828	2.771
σ - AC	0.950011057	0.741336517	0.795998395	0.719476934	0.821967306	0.770244968
p-value	0.244737847	0.070506139	0.142597965	0.187707	0.393687664	0.257126633