Chapter 15 - Gitga'at Plant Project: Bridging the Gap between Generations

Edōsdi Judith C. Thompson

The impetus for the Gitga'at Plant Project was for students to make connections with their Elders, through school science curriculum, in order to learn about their culture, land, and language, which are all inextricably linked. Indigenous Knowledge (IK) is recognized as an important type of locally based knowledge held by Indigenous and other long-resident peoples (Berkes, 2012; Snively & Corsiglia, 2001; Turner, Ignace & Ignace, 2000). First Nations peoples have had, and continue to have, an intimate relationship with their homelands, based on knowledge that is highly localized, cumulative through many generations and socially oriented (Kawagley et al., 1998). Yet, Elders and educators in First Nations communities have expressed deep concerns that youth are no longer learning the cultural and local environmental knowledge that sustained them and their ancestors for generations (R. Quock, Tahltan Elder, personal communication, 1997; R. Dennis, Tahltan Elder, personal communication, 1992; H. Clifton, Gitga'at Elder, personal communication to Nancy Turner, 2002). Sadly, the opportunities for communicating IK and for incorporating this type of knowledge into public school science curricula are scarce.

Cameron Hill and Eva-Ann Hill, First Nations educators and members of the Gitga'at Nation of Northern Coastal British Columbia, recognize that their children and youth have not had the same opportunities as past generations to acquire knowledge about their home territory and traditional resources. They see the need for themselves and other teachers to take the lead in remedying this situation:

> You would think that growing up in such an isolated First Nations community, such as Hartley Bay, where the Gitga'at people reside, that our youth would be more in-tune with their natural surroundings. This is, however, not the case, in certain areas such as botany. The knowledge of plants within Hartley Bay lies with our Elderly people. It is up to us, as teachers, to bridge the gap between generations. (C. Hill & E.-A. Hill, personal communication to Judith Thompson, 25 September, 2003)

As First Nations educators, we need to find ways to bring IK into the school science curriculum in order to make science more accessible and relevant to First Nations children. Children spend more hours in a classroom removed from the land than with their extended families learning on the land. Helping to fill this need was the main motivation for developing the Gitga'at Plant Project at the Hartley Bay School (Thompson, 2004).

Background to the Study

This research began when Dr. Nancy Turner, (Professor, University of Victoria) an internationally distinguished ethnobotanist, presented a proposal to the school in Hartley Bay in which individual students

would research and learn about a specific indigenous plant that is culturally important to the Gitga'at people. In conversations with Gitga'at Elders Chief Johnny Clifton and Helen Clifton, as well as Ernie Hill Jr., principal of the school and a hereditary chief of the Eagle clan, Turner was told that the children and youth were not learning as much cultural or local environmental knowledge as previous generations had learned. This erosion of IK was a concern for the Elders. Around the same time, I was approached by Dr. Charles Menzies, (Professor, University of British Columbia), who is Gitxaała Ts'msyen, to develop a science curriculum for his research project, "Forests for the Future," a two-year research project with the goal of conducting community-based research into local ecological knowledge in the Ts'msyen community of Gitxaała. The curriculum would be based on the local ecological knowledge of the Gitxaała people, another coastal Ts'msyen group located northwest of Hartley Bay. Menzies saw the development of culturally relevant education resources as a way to give something tangible and useful back to the people of Gitxaała. As part of this project, I developed a curriculum unit entitled, "Traditional Plant Knowledge of the Tsimshian" (Thompson, 2003). ("Tsimshian" was changed to "Ts'msyen" in 1998 by fluent Sm̲'algyax teachers to reflect the correct spelling of the term).

This project was designed to provide the Gitga'at youth of Hartley Bay with the opportunity to learn about the plants that have been, and continue to be important to their people. More significantly, it was designed to re-establish the connections between Aboriginal youth and their Elders in order to facilitate the transmission of Indigenous Knowledge. My research, in collaboration with the students, teachers, parents and guardians, Elders and community members of the Gitga'at community of Hartley Bay, was to help implement the Gitga'at Plant Project and to study its effectiveness for the students and community of Hartley Bay as a means of supporting the intergenerational transmission of cultural and environmental knowledge.

My central research question was: How does the involvement in a school research project designed to promote the intergenerational transmission of IK impact Aboriginal youth and their community?

Given the importance of retaining local environmental knowledge within a community, the following specific points were addressed: what the students learned and/or experienced as a result of the plant project; whether the Gitga'at Plant Project was an effective way for students to learn about plants and other IK from their Elders; and other methods that could be used to enhance the transmission of knowledge between generations.

This study took place in the Gitga'at community of Hartley Bay, British Columbia, which has a population of approximately 200. Hartley Bay is located 140 kilometres (90 miles) southeast of Prince Rupert, BC, at the confluence of Grenville Channel and Douglas Channel. The Hartley Bay School is located in the heart of the community. At the time of the study, the Hartley Bay School had 68 students, with four classes ranging from Nursery School to Grade 12. All of the students were of Ts'msyen descent. The staff was made up of a principal, five teachers, a learning assistance teacher/librarian, a Sm'algya̲x language teacher, an administrative assistant, and a custodian. With the exception of two teachers, the rest of the staff were members of the Gitga'at Nation.

The Gitga'at people are members of the Ts'msyen Nation. The Ts'msyen inhabit the lower portion of the Skeena River, the islands found at the mouth of the Skeena, and along Douglas Channel (Tsimshian Chiefs, 1992). Gitga'at territory includes a large portion of the mainland south of the Skeena River, as well as several offshore islands. Ts'msyen territory is characterized by a mild, marine climate with heavy precipitation, which in turn supports dense, wet conifer forests. Biologists recognize the Coastal Western Hemlock Zone as the major biogeoclimatic zone within Ts'msyen territory. The Ts'msyen speak the Sm'algya̲x language.

Methodology is important in that it sets the context for the questions being asked; it establishes the tools and methods to be used and shapes the analyses. In regards to Indigenous methodologies, Māori scholar Linda Tuhiwai Smith (2012) stated that they are "often a mix of existing methodological approaches and indigenous practices (p. 144). It was important to me as a First Nations educator and researcher to ensure that this project was framed within

an Indigenous context. I chose to use community action research within an Indigenous context as the overarching methodology, with a case study approach as the more specific design.

Smith (2012) maintains that a community action approach makes a positive difference in the lives of people in the community, and also provides a way for First Nations researchers to actually do research in their own communities. While many research methodologies have assumed that the researcher is an outsider able to observe somewhat objectively, Smith (2012) states that, "Indigenous research approaches problematize the insider model in different ways because there are multiple ways of both being an insider and outsider in indigenous contexts" (p. 138).

The Gitga'at Plant Project

The Gitga'at Plant Project was developed and implemented by two Hartley Bay teachers, Cameron Hill and Eva-Ann Hill, and myself, thereby creating the case by our actions. Essentially, the Gitga'at Plant Project, the case was a community action research project that was participatory and collaborative in nature, which involved the community in an attempt to make a positive difference in the education of the children in Hartley Bay.

The project was conducted from September 2003 to June 2004. Working in pairs, Grades 9-12 Gitga'at students each researched a particular plant known to have cultural importance to their people. They consulted with Elders and community members and carried out literature and web-based botanical research, as well as made observations of their plants during field study sessions (Figure 15.1).

Figure 15.1 ▲ Student measuring Skunk Cabbage with a ruler in the field notebook. Photo by Edōsdi Judith C. Thompson (2003).

The student researchers gave oral presentations of their findings at community gatherings, and picture posters of the students with their plants and a summary of what they learned were presented to the community. A book entitled *'Nwana'a lax yuup: Plants of the Gitga'at* (2006), edited by Nancy Turner and Edōsdi (Judith Thompson),

which included almost 100 plants, was presented to the community as a way to honour the knowledge of the plant informants and to thank the community for their assistance and input. The 12 plants that the students researched were given prominence in the book, which included their detailed findings, who they learned from, and pictures of themselves and their plants.

The Gitga'at Plant Project was made up of three stages: (1) Development, (2) Implementation, and (3) Evaluation.

Development. It is important to state that there were two stages of development for this project. The first stage involved myself developing a relationship with the community of Hartley Bay. The second stage involved the actual development of the Gitga'at Plant Project. From February 2002 to April 2003, I developed a unit plan entitled "Traditional Plant Knowledge of the Tsimshian" (Thompson, 2003) which was made up of six lessons:

- Learning about Traditional Plant Knowledge
- Plant Observation, Collection, and Identification
- Plant Use of the Tsimshian
- Plant Harvesting, Preservation, and Storage
- Plant Nutrition
- Relationships with other First Nations and their Plants

While the curriculum was specific to the Ts'msyen, I tried to make it flexible enough to be adapted to other First Nations groups.

Indigenous Knowledge is holistic in nature and therefore not confined to the artificial boundaries of disciplines or subject areas. Therefore, while these lessons were developed with science courses in mind, they also covered the prescribed learning outcomes in courses listed under Social Studies and Applied Skills, as well as Sciences. I felt unsure about matching IK to the then prescribed learning outcomes listed in the *Science Integrated Resource Packages* (Science: K-7, 8-12 IRP, 2002a, 2002b) which came from a Western perspective. I wanted to be guided by First Nations' ways of knowing, First Nations peoples, and First Nations communities. I also wanted to encourage all teachers to use the curriculum. As many community schools have mixed grade classes, the lessons were prepared for Grades 5 through 12 so that students and teachers could utilize the materials and bring Indigenous Knowledge into their classrooms.

Implementation. Consistent with community action research, the development process continued while the Gitga'at Plant Project was being implemented. The teachers and I were constantly responding to student feedback, taking notice of what worked and what did not, in order to make their teaching more productive, informative, and relevant to the students. As the project progressed, changes were made along the way and lessons or assignments were developed as needed. For example, Cameron, Eva-Ann, and I planned a lesson together involving a role-play about the protocols of interviewing an Elder or other resource person.

During the times when I was in Hartley Bay, I routinely met with the students both formally and informally. I was often present for class discussions, either as an observer or as participant, and occasionally contributed to lessons that were being taught. Cameron and Eva-Ann did most of the implementation of the project with the students. With the production of a plant booklet, posters, and by speaking at community gatherings, students were actively involved in the dissemination of their newly learned skills, knowledge and wisdom.

Evaluation. The evaluation of the project began as it was implemented. I received feedback from the students on an ongoing basis in the form of feedback cards and from their field notebooks. I met with Cameron and Eva-Ann every day while I was in Hartley Bay and also kept in contact via telephone and electronic mail. All of the teachers provided me with written feedback. The interviews of the plant informants, parents/guardians, and the rest of the school staff began after the students had completed their interviews.

Discussion of the Findings

I have organized the results in terms of the four research questions, with the findings being discussed within the context of relevant discourse.

Experiences of the Participants

Overall, the students reported very positive experiences. In particular, students wrote and spoke about how much they enjoyed learning from their Elders and learning about the Gitga'at uses of plants (Figure 15.2). For example, a Grade 9 student commented:

> Well, I think it's pretty cool if you ask me and I hope we can do this again…. And well, I think this book will be cool and maybe our kids can look at this or these books and maybe they'll get to do this experience too and they'll have fun, lots of fun.

Figure 15.2 ▲ Harvesting Ksiiw with Gitga'at Elder Archie Dundas. Photo by Edōsdi Judith C. Thompson (2003).

Many students shared this knowledge with family, with parents seeing positive changes in their children. The teachers had varying degrees of involvement in the project and all of them spoke or wrote about the cultural significance of the project. A First Nations teacher raised in Hartley Bay wrote:

> A whole project done by First Nations for First Nations, what more could you want? A community like Hartley Bay where all of the plants are from and used by the people here, with input from the people that know and use the plants. The Gitga'at voice shines through our kids in the project.

Many adults saw changes in the children's self-esteem, their pride in themselves and their people, and confidence in their new knowledge and wisdom. Most of the Elders were impressed with the way that the students behaved and with the respect that they showed to them, with many expressing a desire to spend more time with students teaching them about their traditional knowledge. Cameron Hill and Eva-Ann Hill stated how it was the responsibility of teachers to "bridge the gap between generations" and it is apparent that the Gitga'at Plant Project provided a wonderful opportunity for children to connect with their Elders. One of the goals of the project was to facilitate and strengthen the connection of First Nations youth to their land and culture through their Elders as a means of improving their self-identity, cultural pride, self-esteem, and ultimately their health and well-being. As Smith (2012) states, "Connecting is related to issues of identity and place, to spiritual relationships and community wellbeing" (p. 150).

The project also gave youth the opportunity to communicate with their parents about schoolwork, as several either shared their knowledge with the parents or asked for assistance. One mother said that her child never got into anything at school, but now seemed really interested in the plant project. Another parent noticed that her children were "into plants now." Yet another parent wrote, "My son definitely tackles homework assignments in a different way; more methodical." This same parent stated that, "I didn't realize that so many of them have a love of the outdoors." Another parent said that she told her son that she wished that she had been able to work on such a project when she was going to school and that he was lucky.

Torres (1998) noted that parents often think that their children may not need them as much as they enter high school, and it is at this very time in their development that youth start to feel less connected to their school, their family, and their community. Parents may also feel disconnected from their children and the school at the very time when these students need their family involved in their education, and when they need to see themselves and their community reflected in the curriculum. As Torres stated (1998), "It is an age at which young people's connections to families, communities, and schools need to be strengthened rather than strained" (p. 60), and the present findings underscore this importance.

What the Students Learned

Students were able to articulate clearly what they learned in terms of knowledge and skills. They learned the Sm'algyax names, characteristics, medicinal, material and food uses, as well as the cultural significance of the plants, and were able to explain these to their classmates and community members. A Grade 9 student wrote, "I learned stuff on salal berries. Like making jam and how they used the leaves for when they were drying seaweed. They would put the leaves in the middle so it wouldn't stick together." Another student reported what she and her partner learned:

> We learned that you could make string with yellow cedar but you can't use it for warp (or something like that) but you can't rub your eyes after touching it. You have to wash

> your hands after touching it. And you could make a rectangular shelter you just take a piece of yellow cedar in a rectangular shape lay it on the ground and get more pieces and sticks and if it's raining you can put the yellow cedar the slippery way. So it will just drain off.

In regards to a food plant, a student wrote, "Some things we found out about blueberries were so amazing. I never ever knew they could be used as a medicine." Many students wrote about the plant knowledge and wisdom that was specific to their people and tied to their land. From one Grade 9 student:

> I learned that a lot of people like to eat salmonberries with oolichan grease and sugar or milk and sugar. Salmonberries grow last at Old Town up in the valleys. I also learned that you can eat the oł (sprouts). People really enjoy salmonberry jam at feasts. They never used to use freezers to preserve salmonberries, they would make jam. Salmonberries can stay in the valleys of Old Town until middle of November. Bears and birds really enjoy eating salmonberries.

Another student described the importance of the plant she researched to her people:

> I learned that yew wood is just not a plant, it is very important to us First Nations, it is used for cancer, and some people in Hartley Bay have to drink it, it's used for any kind of cancer.

A Grade 9 student wrote about the importance of taking part in the Gitga'at Plant Project in Hartley Bay: "… doing this experience is really fun, getting to know what is important to our relatives and what relatives have to use it, it's very interesting."

Language was an important aspect of the Gitga'at Plant Project as the students learned the Sm'algyax names for the plants they researched, many acknowledging: "We learned the Sm'algyax name *'smmaay'* which means oval-leaf blueberry, if I can remember correctly." Another student wrote, "I learned the Sm'algyax name for devil's club." Two sets of partners identified several Sm'algyax names for their plant at various stages of growth and development. For example, one set of partners identified the Sm'algyax names for the actual salmonberry plant, as well as the names for the berries when they are both yellow and red. A Gitga'at teacher wrote, "Even though I don't think many of us feel we know much about our language, I feel we do and this project brought it out. We know our language more than we think."

With regard to skills, students learned about field research, text research, information integration, and interviewing skills. One teacher stated:

> The students' experience with the plant project has been positive on so many levels, from the standpoint of doing research, of sharing knowledge, of marrying the practical experience of fieldwork, to the 'book learning'. They learned to meet deadlines, to

> write reports, and to express what they were learning in a variety of ways of reporting. Students also learned about the protocols of their community as well as the protocols of interviewing individuals.

A First Nations teacher stated, "The protocols were all followed to a tee. I think all of our Elders were well informed and all protocols done, done well." The adults were able to identify additional gains, such as pride and respect, and self-confidence. When the students showed their teacher the work they had done, the teacher could see the pride they had in their work. Another teacher wrote, "I saw growth in the students. They were shy at first to go out and do the interviews, but they did it, and they seemed to have pride in the results that began to appear." One of the Elders said that many of the students were showing interest in their people's knowledge as well as pride in who they are.

The Gitga'at Plant Project included learning experiences that validated the students' culture, their community, and their people as sources of knowledge. It demystified knowledge by giving students the opportunity to be researchers and thereby making knowledge accessible, it emphasized the importance of their Sm'algyax language, and helped to redefine the relationships between students, teachers, parents, and community members, as well as the school and the community in general. Besides learning about plants, one student wrote how one Elder talked to him about his family: "I learned about my family. She told me who I was related to."

In their role as researchers, the students gave presentations of their findings at community gatherings. Posters that included pictures of all of the students with their plants and a summary of what they learned were presented to the community Elders and others with whom the students consulted. This project had a lot in common with the "Sharing" project outlined by Smith (2012), which is about First Nations researchers sharing information and knowledge that they were discovering with the community. "For indigenous researchers sharing is about demystifying knowledge and information and speaking in plain terms to the community" (Smith, 2012, p. 162). This happened several times during the Gitga'at Plant Project when the teachers, students, and I shared with the community what the project was about, why it was important, and the knowledge that the students were learning. As Smith (2012) has stated, "Oral presentations conform to cultural protocols and expectations" (p. 162).

The Effectiveness of Intergenerational Transmission of Knowledge

In this study, the "effectiveness" of instruction was gauged by: the overall positive responses from all involved, the tangibles that were produced by the students, such as information included in the booklet, or the students' work that was included in the creation of the posters, and the relationships between generations that were strengthened. The comments from both students and adults alike were a good indication of their interest and accomplishments. Recognition by adults and Elders of significant learning and of their pride and respect was also very important (Figure 15.3).

Besides the Elders involved with this project, Elders from other First Nations communities talked about the need to use the school system as well as modern technologies and contemporary approaches in order for Aboriginal youth to learn from their people about their ways of knowing (Robert Quock, Tahltan Elder, personal communication, 2000; Annie Ned as cited in Cruikshank, 1990). As Medicine (2001) stated, educators can work with

Elders in order to, in the words of Cameron and Eva-Ann Hill, "bridge the gap between generations," so that First Nations children can learn about their people's traditional ways of knowing within a contemporary setting.

Figure 15.3 ▲ Harvested devil's club by student. Photo by Edōsdi Judith C. Thompson (2003).

Enhancing Intergenerational Transmission of Knowledge

All involved with the project generated ideas about how the Gitga'at Plant Project could be expanded upon or changed. Ideas such as including the whole school in such a project and the concept of role modelling, whether by Elders, adult community members, or older students, would be an important step toward community commitment and involvement. One student wrote, "I think the younger students would enjoy doing the plant project. I would help them. I would help them with their interviews." Another stated, "I think that it would be cool for the younger classes to do what we are doing and it would be good experience for when they get older." As well, expanding the classroom to the outdoors was raised as a way to enhance the intergenerational transmission of knowledge. What was evident was the importance of ongoing and regular opportunities for learning and sharing, and the need to tie learning to everyday activities. Language was raised as a way to bring about both the learning of IK and as a way to re-connect youth to their Elders.

Implications

The study's major findings inform the discussion on Indigenous Science, educational theory and practice in this area, and cultural identity and transmission of knowledge. Several implications can be construed from the study results and these implications are outlined and substantiated by illustrative examples.

Indigenization of Science Curriculum

There is a continuing need for the development of curriculum that is relevant to the lives of First Nations students and that involves them as active learners. Indigenous Knowledge needs to be incorporated into the mainstream curriculum, providing locally relevant ways and examples of learning about the environment, plants, animalss, geography, and language that will give students self-confidence and a stronger sense of identity and community.

In regards to the Gitga'at Plant Project, the focus of the project was to bring IK into the science curriculum. A teacher wrote that the most important thing that the students learned was "that traditional values and knowledge can exist side by side with 'modern' science, and that the values and knowledge of the past has a dominant place still today." First Nations students can become more successful at school with the development of such a curriculum.

Smith (2012) noted, "Indigenous students across many contexts have struggled with Western science as it has been taught to them in schools. Science has been traditionally hostile to Indigenous ways of knowing. Science teaching in schools has also been fraught with hostile attitudes towards Indigenous cultures, and the way Indigenous students learn" (p. 161).

While it is important to educate students about different nature-knowledge systems besides Western Science, the world of science academia should also be open to other worldviews.

Community-based Learning The application of this learning must be brought into children's everyday lives, not only in their lives at school. Elders and adult participants were adamant that the learning had to go beyond the gathering of information to the "hands on" learning experiences with Elders teaching children about their traditional knowledge systems on the land. This type of learning happens when the Gitga'at people travel to Ki'el, their traditional seaweed camp, and children learn how to harvest seaweed and to catch, prepare, and dry halibut from Elders and family members. These types of learning experiences need to become how the students both live and learn. This can only come about if the experiences are relevant to the students' lives and if the students can be active participants in their learning. In the Gitga'at Plant Project, students learned from their Elders about the Gitga'at uses of plants, along with other culturally relevant knowledge and wisdom. By using the school system and curriculum, a contemporary method was utilized to bring back and/or continue the intergenerational transmission of Indigenous Knowledge. Turner (2014) stated that "a rich legacy of ethnobotanical and ethnoecological knowledge has persisted, thanks to the determination of many elders and others to keep it alive (p. 259). With such projects directly involving children learning *about* their land *on* the land from Elders, IK will be strengthened and revitalized.

Youth Participation in Life-career Planning Another implication deals with the active participation of youth in planning for their future. Marshall, Shepard and Batten (2002) list concerns that face youths living in rural communities, such as, "isolation, health risks, lack of occupational role models, limited access to training or education, and cultural or identity differences" (p. 2). This project provided students with many of the skills needed for life-career planning, such as the research skills they acquired, presentation skills, computer and internet skills, working with others, to name a few. However, like the youth in Marshall, Shepard, and Batten's (2002) study, they may "need help to picture how they might actually implement these transferable skills to real work and life roles" (p. 7). The results indicate that students feel more confident in regards to their schoolwork and have more pride about who they are from taking part in this plant project; this may increase their hopes and aspirations about future possibilities (Marshall et al., 2002).

Importance of Language The effects of colonialism have had devastating repercussions on the transmission of knowledge. While many Aboriginal people were not allowed to speak their language in the residential schools, others were not taught their language because of the misconception that they would do better in school and in

everyday life if they learned to speak English and forget their language (Julia Callbreath, Tahltan Elder, personal communication, 2001; Battiste, 1998; Smith, 2012). Culture is tied to language (Battiste, 1998) so if children are not learning their language, they are probably not learning other cultural ways of their people. Turner writes, "Language and plant names are tied to places, to narratives, to technologies, and to seasons. They are key to communicating local ecological knowledge and therefore key to people's survival and to the continuity of their knowledge, practice, and belief" (Turner, 2014, p. 188). From this research, adult community members talked about the importance of children learning about IK from their Elders. This could have an impact on students learning their Sm'algyax language outside of school, which could complement their language classes in school.

In my doctoral research, which focused on the revitalization of my Tahltan language, the importance of children learning their Ancestral language was made clear to me by Tahltan fluent speakers, Elders, and language teachers. "From what I learned, our land is intrinsically tied to our language, and from that stems our culture and worldviews, and the relationships that we have with all the things that we share the land with" (Edōsdi, 2012, p. 119).

Intergenerational Transmission of Knowledge The transmission of knowledge is important to Aboriginal communities. Retention and promotion of IK can be enhanced by providing opportunities and situations that encourage and facilitate the learning of IK; factors that contribute to the maintenance of IK in a community. Because of changing times and colonialism, amongst other things, many of the circumstances supporting and facilitating interactions between children and Elders are disappearing quickly or are already gone. It is urgent to address this gap and to help re-connect children to Elders. While many reasons can be given for why such interactions might not work, there is a need to work together to explore solutions. The community and families have to want this to happen, and it can begin at the school with projects such as the Gitga'at Plant Project.

Research *with* and *by* Aboriginal Communities Aboriginal control over research in their community is another important implication of this research. While I am not from Hartley Bay, as a First Nations person, I wanted this project to involve the community as much as possible, and especially the students. The people interviewed did not have a negative thing to say about the project, only suggestions for ways to improve upon it. With the students taking on the role of "researchers," they were learning research skills as well as learning about cultural protocol and about their peoples' IK. As Menzies (2004) stated, it is vital that First Nations communities take control and play an active role in research that takes place in their communities and with their people. As a member of the Ts'msyen Nation, Lewis (2004) pronounced, "As Gitxaała we are no longer interested in sitting back and watching our country being exploited by outsiders" (p. 8). From these data, it appears that the people of Hartley Bay felt like they were actively involved in and benefitted from this research project.

Conclusion: Directions for Future Research

The majority of the Hartley Bay School administrators, teachers, and support staff are members of the Gitga'at Nation. Future research could determine how such a school project would work in a First Nations community that does not have their own people in such pivotal educational roles. Another possibility would be to implement the project in an urban community where there are many Aboriginal children from many different First Nations, as well as non-Aboriginal students in the schools. What is also needed is a better understanding of effective ways in which Aboriginal learning and teaching can be facilitated, particularly in relationship to IK. Working with First Nations communities to identify elements of IK, as well as ways of transferring this knowledge and wisdom, is an area that needs to be looked at more closely (Thompson, 2004).

As a First Nations educator, learner, and researcher, I know how important it is for First Nations children to see their own culture, their ways of knowing, their language, their people and themselves reflected in the curriculum in

a way that is meaningful and relevant. The need for curriculum that integrates First Nations knowledge and wisdom is critical. It is vital that we represent all peoples in the school curriculum, not just that of the dominant culture. As well, First Nations students need to see that learning about their people's ways of knowing belongs not only in social studies, art, First Nations Studies, or language courses, but also in science courses and that it is viewed as legitimate science knowledge.

REFERENCES

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

Berkes, F. (2012). *Sacred ecology* (3rd ed.). New York, NY: Routledge. Retrieved from http://dx.doi.org/10.4324/9780203123843

British Columbia Ministry of Education (2002a). *Science K to 7: Integrated Resource Package*. Victoria, BC: Ministry of Education, Province of British Columbia.

British Columbia Ministry of Education (2002b). *Science 8 to 12: Integrated Resource Package*. Victoria, BC: Ministry of Education, Province of British Columbia.

Cruikshank, J. (1990). *Life lived like a story: Life stories of three Yukon Native Elders.* Lincoln, NE: University of Nebraska Press.

Kawagley, A. O., Norris-Tull, D., & Norris-Tull, R. A. (1998). The Indigenous worldview of Yupiaq culture: Its scientific nature and relevance to the practice and teaching of science. *Journal of Research in Science Teaching*, *35*(2), 133-144. Retrieved from http://dx.doi.org/10.1002(SICI)1098-2736(199802)35:2<133::AID-TEA4>3.0.CO;2-T

Lewis, J. (Wuyee Wi Medeek) (2004). Forests for the Future: View from Gitxaala. *Canadian Journal of Native Education*, *28*(1/2), 8-14.

Marsden, S. (Ed.). (1992). *Na Amwaaltga Ts'msiyeen: The Tsimshian, trade, and the northwest coast economy.* Teachings of Our Grandfathers: Suwilaay'msga Na Ga'niiyatgm, Vol. 1. Prince Rupert, BC: Tsimshian Bands of Lax Kw'alaams, Gitka'ata, and Lax Klan, and School District #52.

Marshall, A., Shepard, B., & Batten, S. (2002). First Nations and rural youth: Career exploration narratives. *NATCON Papers 2002*. Retrieved from http://contactpoint.ca/wp-content/uploads/2013/01/pdf-02-12.pdf

Medicine, B. (2001). *Learning to be an anthropologist and remaining "Native": Selected writings*. Urbana and Chicago, IL: University of Illinois Press.

Menzies C. R. (2004). Putting words into action: Negotiating collaborative research in Gitxaała. *Canadian Journal of Native Education*, *28*(1/2), 15-32.

Smith, L.T. (2012). Decolonizing methodologies: Research and Indigenous peoples (2nd ed.). London, UK: Zed Books.

Snively, G., & Corsiglia, J. (2001). Discovering Indigenous science: Implications for science education. *Science Education*, *85*(1), 6-34. Retrieved from http://dx.doi.org/10.1002/ 1098-237X(200101)85:1 <6::AID-SCE3>3.0.CO;2-R

Thompson, J. C. (Edōsdi). (2004). *Gitga'at plant project: The intergenerational transmission of traditional ecological knowledge using school science curricula* . Masters thesis, University of Victoria, Victoria, BC. Retrieved from http://hdl.handle.net/1828/702

Thompson, J. C. (Edōsdi). (2012). *Hedekeyeh Hots'ih Kāhidi – "Our Ancestors are in us": Strengthening our voices through language revitalization from a Tahltan worldview*. Doctoral dissertation, University of Victoria, Victoria, BC. Retrieved from http://hdl.handle.net/1828/4213

Torres, M. (1998). Celebrations and letters home: Research as on ongoing conversation among students, parents, and teacher. In A. Egan-Robertson and D. Bloome (Eds.), *Students as researchers of culture and language in their own communities* (pp. 59-68). Cresskill, NJ: Hampton Press.

Turner, N. J. (2014). *Ancient pathways, ancestral knowledge: Ethnobotany and ecological wisdom of Indigenous peoples of northwestern North America, Volume 1: The history and practice of Indigenous plant knowledge*. Montreal, QC: McGill-Queen's University Press.

Turner, N. J., Ignace, M. B., & Ignace, R. (2000). Traditional ecological knowledge and wisdom of Aboriginal peoples of British Columbia. *Ecological Applications*, *10*(5), 1275-1287. Retrieved from http://dx.doi.org/10.2307/2641283

Turner, N. J., & Thompson (Edōsdi), J. C. (Eds.). (2006). *Plants of the Gitga'at people: 'Nwana'a lax yuup.* Hartley Bay, BC: Gitga'at Nation; Victoria, BC: Coasts Under Stress Research Project and Cortex Consulting.