METIS STUDENTS:

LEARNING AND ENGAGEMENT

THROUGH SCIENCE EDUCATION

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ABSTRACT

The present study investigated the extent to which students engaged in learning if factors that influenced student engagement were in place. The factors were: relevancy, potency, competency, and belonging and had been identified by the research literature to influence student engagement. The study took place in a small, isolated, Métis community in Saskatchewan and involved grade 10 students (3 female and 2 male). The teacher used inquiry methods to teach science with units designed to be well connected to the community of the participants.

The procedure of the investigation was case study using qualitative analysis. The participants were interviewed up to three times throughout the first semester of the school year. Data were gathered from the interviews and classroom observations. The interviews and observations were analyzed for the predicted factors of student engagement, as well as emerging factors. Motivation and responsibility were the two additional factors that seemed to influence the participants' engagement with learning.

I conclude that the participants did engage in learning, at varying levels, although relevancy, potency, competency, and belonging had less influence in this study than expected. Motivation and responsibility seemed to have the greatest influence on three of the participants who were striving to meet personal goals for which further education was required. These participants were considered by societal standards to be successful in school – completing grade 12 "on-time". The other two participants were considered not successful (by Western society's definition of successful), yet were influenced by the factors of engagement, to some extent. Their lack of school success seemed to arise from a less than meaningful school experience that allowed out-of-school experiences to be their priorities. For all the participants, there seemed to be a disconnect between in-school learning and out-of-school life as in-school learning had little impact on the participants. This led to the idea that school was less than meaningful for them.

It is important that the education offered to students, especially those in Aboriginal communities, be specific to the culture and place of the community. These efforts may help students better connect in-school learning to out-of-school living and contribute to a more meaningful educational experience.

ACKNOWLEDGEMENTS

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CHAPTER 1 - INTRODUCTION

Education would be so much more effective if its purpose were to ensure that by the time they leave school every boy and girl should know how much they don't know, and be imbued with a lifelong desire to know it. *- Sir William Haley*

The Researcher

Until now, I had put little thought into what kept me in tune with my education. Looking back over my elementary and secondary school experiences, I believed that I was engaged in learning. I was raised in a small city that had only one high school where the majority of teachers were dedicated to providing a high quality learning experience for all students. I looked forward to going to school and, for most classes, was interested in what was happening. The usual range of teachers was a part of my learning, from the boring, lecture-preferring, monotone-speaking teacher to the attention-catching, hands-on learning teacher. Most of my teachers were passionate and dedicated; all were respectful and caring. The school had much to offer and was welcoming. My peer groups were plentiful; my community was supportive. Did this contribute to my engagement with learning? Not to an extent of which I was conscious; perhaps it was simply inherent and that was a strong enough foundation on which I was able to nurture my education.

My path through education was somewhat diverse. As a teen, I had full intentions of attending university and I maintained a science focus. My first experience through university was somewhat disappointing as I lacked the motivation to participate in the teacher-centred learning that most classes offered, most of which were typical of university-learning. They involved numerous lecture hours and note taking. Laboratory activities were cookbook style and disengaging. My approach to obtaining my degree was not much more than a desire to simply get it finished.

Eight years later, I was drawn back to university to study education, which seemed to better suit my personality, my beliefs, and my personal and family goals. This proved to be educationally lucrative as I participated in opportunities that were student-centred and engaging. I found myself excited about attending class and I worked diligently to ensure my success. Completing this degree was not an endpoint as it took less than three years for me to return to graduate studies, where I believe my understanding of education and practice of teaching has evolved immensely. As I continue to learn, for learning never ends, I find myself looking for opportunities to involve others in the learning process, whether it is my colleagues, family, or students.

To better inform my practice so that I may contribute to students' successful educational experiences, it was first necessary to investigate student engagement for myself. That is what led me down this research path. As science is my primary interest, it seemed natural that a science class would be a part my research about students engaging in learning, if all the right factors were in place. These factors, as defined from much of the research on engagement, are that the learning should be relevant to the students (in all aspects of their lives) and must be a part of their sense of potency and competency. A sense of belonging to communities is also integral to student engagement.

The Research Community

The community in which I conducted my research has a long history. It was originally established as a trading post, prior to European settlements on the Western prairies. There must have been much activity as it was located on one of the major trading routes. Many of the people who made their homes in the community are Métis. Presently, community members may be First Nations, Métis, or of European heritage. People have established their homes in the community over many generations and some families arrived with intentions of staying only for a short time, but were pleasantly compelled to make it their permanent home.

Today residents may participate in summer activities such as canoeing, fishing, berry picking, fastball, volleyball, and a summer festival. In the winter, residents may partake in a variety of activities such as hockey, ringette, cross-country skiing, curling, ice-fishing, trapping, and hunting. An entertainment centre hosts many functions, such as dances, potluck suppers, and cabarets. Within the school community, students may participate in drumming, jigging,

culture camps, sweats, volleyball, basketball, badminton, and school-supported canoe trips. All of these activities are opportunities to strengthen culture and community.

A significant feature of the community is the high school, which came to be through community and education initiatives and with funding from government sources and the school division. The high school is a learning centre for approximately 200 students ranging from grades seven to twelve, and is also home to adult upgrading. The school has a commons area, gymnasium and stage, walking track, administration offices, town library, an elders' room, and classrooms for grades seven to twelve, as well as rooms used for Industrial Arts classes. The large home economics area hosts classes and supports community events, such as feasts and entertainment.

Coming into the school through the main doors, one will first enter the commons area where the teachers are present each morning. One typically finds the Principal, Assistant-Principal, or another teacher greeting students and guests at the door. The students are greeted by name as they are welcomed into the school; guests are also made to feel at home. Most of the staff are originally from the community or nearby. At some time, they would have temporarily left the community for post-secondary education but returned to teach at the school and give back to their community.

The population of students tends to decrease as they move closer to grade 12. Typically, there are about 30-35 students in grade 7, yet the school graduates less than half that number of students each year. Since the grade 10 year appeared to be a typical returning year for students who have previously left school, perhaps increased student engagement in grade 10 classes would lead to a higher and on-time graduation rate of students in the community. This, along with the teacher's initiative, made this the ideal classroom for the study.

I came to the community to assist with another research project and met the grade 10 science and math teacher who wanted to provide learning opportunities that would be meaningful to the students. He wanted the students to participate in activities that took them out of the classroom. It was on this initiative that he and his students were invited to participate in this research. I wondered if in this northern Métis school, where student on-time (three years from starting grade 10) graduation rates are low, would these factors influence student engagement. Research demonstrates that four factors affect students' engagement: belonging,

relevancy, potency, and competency. To what degree was the engagement in learning of grade 10 students in a northern Métis community affected by these factors?

Defining the Terms

Indigenous and Aboriginal

The term "Indigenous" is a term used globally to refer to the first peoples of an area. In Saskatchewan, First Nations peoples are those nations who lived here prior to contact with Europeans. The Métis peoples are a blend: the children and their descendants who resulted from marriages between European traders and First Nations women. In this thesis, I use the term Aboriginal to refer specifically to the Canadian situation. Aboriginal includes First Nations, Métis, and Inuit peoples (Statistics Canada, 2007)**.**

Community

The definition of community is complex and the context of its use in this research makes it important to consider. Generally defined, community may be:

> A group of interacting people, living in some proximity (i.e., in space, time, or relationship). Community usually refers to a social unit larger than a household that shares common values and has social cohesion. The term can also refer to the national community or international community, and, in biology, a community is a group of interacting living organisms sharing a populated environment. A community is a group or society, helping each other. (Community – Wikipedia, 2012)

Some perspectives of community may be (and are not limited to): psychological (definition by McMillan and Chavis, 1986 follows in this section) and anthropological (based on settlement, cultural, and social interaction). The Oxford Canadian Dictionary (Community, 2006) shows a similar complexity: "all the people living in a specific locality...a specific locality, including its inhabitants...a body of people having a religion, profession, etc., in common...fellowship of interests" (p.185). These also refer to geographic as well as anthropological perspectives of community. With these definitions and perspectives all being acceptable, community can be geographical (i.e., a town located in northern Saskatchewan) or

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relational (i.e., people who meet regularly to participate in a common activity or members belonging to a group with similar or related interests – school, sports, social). A relational group could be family or peer groups or an internet group (people who have never met and will likely never meet, but have regular online interactions). Smaller communities can be nested in larger communities and one might find him or herself a member of communities that intersect. For example, one of the participants lived in the town (geographical community), played on a sport team (physical community), attended school with her peers (physical community), belonged to a family (relational), and interacted regularly with an internet group for music development (relational). Her sport team, school and peers, and family communities all existed within her town (geographical); the internet community did not.

McMillan and Chavis (1986), working with the geographic definition argued that one's sense of community depended on the length of residency in a particular location and one's satisfaction with residing there. The number of people one knows and can identify by first name contributes to community, as does one's ability to function competently in that community. This speaks more about functionality of community in terms of one's physical presence in and what can be accomplished in a given community. An emotional aspect of community is seen through loyalty, commitment to, and feelings of satisfaction and safety within the community. Aside from the physical aspect, these points fit a relational community, even if the community exists globally and is connected through internet. This understanding appeared throughout much of the research and it was interesting to note that boundaries can define a community in such a way that it has an identity within a city.

McMillan and Chavis (1986) proposed that there are four criteria by which community can be defined. These are: *membership, influence, integration and fulfillment of needs* and *shared emotional connection*. *Membership* is safety, identity, belonging, and personal investment, and may come with boundaries, which can further identify the community. *Influence* is the mutual relationship that exists between members and the community, where one has an influence on the group and the group can influence its members. This may be interpreted in contrasting ways, such as having a negative influence where some in the group dominate and use power to influence, or it may be positive in that members are supportive of and giving to each other. *Integration and fulfillment of needs* is the sense that there is some benefit or reward for belonging to the community. They have identified components of this to be "status of

membership, success of the community, and competence or capabilities of other members...a strong community is able to fit people together so that people meet others' needs while they meet their own" (McMillan & Chavis, 1986, p. 13). My understanding of this is a symbiotic relationship between members of the community, of which support and encouragement are present; relationships are important.

The last criterion McMillan and Chavis (1986) have in their definition is *shared emotional connection*, which describes the closeness and bonding that comes with contact, interaction, shared experiences, spirituality, and investment in the community. In short, positive interactions, or support and togetherness during crises are a significant part of what is a community.

Community can be interpreted in different ways but common to these is the concept of belonging, which has been woven throughout the work of McMillan and Chavis (1986), and echoed in later research. Osterman (2000) stated that students are affected by a sense of belonging in school. She corroborated the ideas presented by McMillan and Chavis (1986) where one who has experienced all the criteria would likely feel trust, safety, and belonging. This also highlights the significance of relationships. A geographical boundary alone does not define community. The people with whom interactions occur in the manner described above, provide the relationships by which community is further identified.

In the context of my research, community may be defined in the geographical context: the town, a Métis community of about 1500 people, is somewhat isolated in the northern part of Saskatchewan and has all essential services available locally. Driving to this community from a major city centre requires more than four hours. Geographically, this sets boundaries around the research community in terms of it being (relatively) physically isolated. More importantly, though, is the sociological aspect of community in which people share the same cultural history and upbringing. The research community has a history that developed prior to European settlement, as it was a key community in early Canadian history. Many families have lived there for many generations and upon completing post-secondary education, many return to the community. As an outsider to the research community, it was difficult for me to comment precisely on the community aspect, as an entire community; therefore, the community perspective I developed was through my observations and interviews with the participants.

To narrow the scope of the community I investigated, I considered the school and class to be smaller communities of interest. Additionally, when asked about their own communities, the students had their own interpretations. They spoke of sports teams, classmates, peer groups, internet groups, locally bound groups, and other towns nearby. One participant noted that Saskatchewan is his community.

Community and culture are part of learning; however, the education system is a Western mainstream construct. It was interesting to consider how students could take their learning from the education system to their local community (this being the geographical community that holds the students and the people with whom they regularly interact) and if and in what ways their community learning affected their school engagement.

Community was an important concept in this study as it was closely tied to the engagement factor, "belonging". For my purposes, community can include the following: the town in which the students lived, the school they attended, and the relationships they had with family and other groups to which they belonged, and perhaps, even a relationship with the land. I left it to the students to tell me of what their communities comprised. This occurred through various relationships such as those among the participants themselves, peers, family members, teachers, coaches, storeowners, neighbours, and all other people who are typically a part of the students' lives. Students also noted that they belonged to communities outside their town, and when asked to make learning connections they considered these communities as well.

Inquiry

Inquiry involves giving students choices, and thus, inquiry should fit well with the engagement factor "relevancy". This development of inquiry is logical and applicable to the circumstances of my research. The teacher in this research study used guided inquiry and structured inquiry (to be further discussed in Chapter 2) to meet curricular needs while presenting learning in a manner that provided an opportunity for students to engage in ways that were meaningful and relevant to them.

Inquiry can be defined as investigations, questioning, seeking information (inquiry, n.d.), yet the term seems to be used indiscriminately and has many interpretations and misinterpretations. It is understandable that there is confusion. The questions that arise from the confusion are about teacher and student roles, task authenticity, and what does inquiry look like?

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There exists much research that attests to the value of inquiry as an instructional approach; much of the research focuses more specifically its ability to inspire deeper understanding (Leonard & Penick, 2009). Inquiry became a part of education in the early 1900s when Dewey introduced the concept of science education being more than simply learning facts. His model used student-centred teaching with the teacher maintaining an active role as a facilitator. He hoped for students to add to their personal knowledge which required them to study what was important to them.

Over time, inquiry came to look similar to what one some might describe as the scientific process: identify a problem, propose a hypothesis and proceed with an appropriate investigation (Barrow, 2006; Bell, Smetana, & Binns, 2005; Martin-Hansen, 2002; National Science Education Standards, 1996). Science presence in education was further exploited in the 1950s, the time of Sputnik, which led to the understanding that science is viewed as a dynamic discipline to which research and new information causes change and development of new ideas. It was also important that the concept of *science* was understood. Over time, various policies and initiatives have influenced science education in ways that would better prepare students for post-secondary education and experiences (Barrow, 2006). Inquiry has maintained a foothold in science education, even though it has many interpretations. The main point here is that inquiry is now considered good science teaching, defined from other good pedagogies in that students are actively participating in all aspects of science knowledge creation – from initial generating of questions to synthesis, integration and presentation of results.

However, when the inquiry process is misunderstood or when inquiry is misused, the benefits are lost. Many activities designed for learning can be informative and effective, but if a research question is not asked (presumably students' questions), then an inquiry does not follow (Bell et al., 2005). Yet, science education (textbooks, coursework, and teacher instruction, for example) has misused inquiry when students are directed to perform a science experiment with the research question asked for them, accompanied by a pre-determined outcome, such as confirming a gas constant (Fay, Grove, Towns, & Bretz., 2007). Bell et al., (2005) noted that the inquiry process differs from simple research or *cookbook* science. Leonard and Penick (2009) presented examples that demonstrated a misunderstanding of inquiry, which had the students participating in *cookbook learning-style* where the problem, procedure, and results are given to the students. Hands-on learning does not necessarily mean minds-on learning.

In the 1960s, an understanding of inquiry led to the concept that students needed to *do*. This is important to consider, as students may not succeed when inquiry is a new process to them, which means that the teacher's role is important (National Research Council (NRC), 2000). Busy-work does not necessarily mean that learning is happening, yet when students are left on their own, inquiry learning may also not be happening. Learning the inquiry process or the skills requires substantial guidance and the students should be able to progress to independent work with inquiry (Bell et al., 2005). Knowing the hows, whys, and whats of the investigation likely requires guidance until students gain experience in conducting their own inquiries. Scaffolding and guidance are thus acceptable, essential for students to develop the skills and understandings needed to have a successful inquiry experience.

This understanding led to the development of levels of inquiry, which was presented in a table of features and variations of inquiry by NRC (2000, Table 2.6), and as *levels* in a rubric (Bell et al., 2005, fig. 3; Fay et al., 2007, table 2). The highest complexity of inquiry has the students determining the questions, methods, and solutions.

Martin-Hansen (2002) presented types of inquiry, derived from previous research where the simplest inquiry is *structured inquiry*, in which the teacher takes the students through the task to a prescribed endpoint. This also seems to be a *cookbook* type of inquiry, which tends to be, understandably so, the least engaging for the students. This type of inquiry should evolve to what Martin-Hansen (2002) noted as *guided inquiry,* in which the teacher provides less guidance to the students to allow them opportunities to develop skills essential to conducting an inquiry. *Coupled inquiry* (Martin-Hansen, 2002) is an inquiry that starts with the teacher initiating the task by presenting the question and then allowing the students to continue with the investigation in a more student-centred fashion. As students develop inquiry skills, moving towards a more student-centred inquiry is seen with *open* or *full inquiry* (Martin-Hansen, 2002), which is a complete student-centred approach that is initiated through students' questions and is followed by student-designed investigations.

Degrees of inquiry can be ascertained by assessing what is given to the students compared to what the students have to do for themselves. The test to apply to determine if the students are participating in an open or full inquiry considers the extent to which the students are the decision-makers (Leonard & Penick, 2009) or what is provided to the students compared to what they have to construct on their own (Bell et al., 2005, fig 2; Fay et al., 2007, table 3).

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Determining the type or level of inquiry that should be used requires first an analysis of students' needs, keeping in mind that with the type or level of inquiry presented, as learner-centred activity increases, the amount of teacher direction decreases. As the students become more familiar with inquiry, it is hoped that progression from structured or low level inquiry to open or high level inquiry occurs.

In this thesis, inquiry is an investigation initiated through a curiousity or question. It is a teaching method that used to facilitate student-centred learning whereby the teacher may give much assistance to the students in their investigation or guide them as they learn to conduct investigations more independently. In this research, the research teacher used guided inquiry and structured inquiry. Since inquiry involves giving students choices, it should fit well with the engagement factor "relevancy".

Science

An online definition of science is "knowledge or a system of knowledge covering general truths or the operation of general laws especially as obtained and tested through scientific method" (Merriam Webster, 2011). This matches the definition by Aikenhead and Ogawa, who studied knowledge systems (2007). They contrasted the study of nature through the different lenses of Indigenous[1] and Eurocentric ways of knowing. Their claim is that Eurocentric science has progressed through historical movements to become a knowledge system that is supported through empirical evidence and operated in elements of objectivity. "Eurocentric sciences possess a powerful way of knowing about nature, and this includes knowledge appropriated over the ages from many other cultures" (Aikenhead & Ogawa, 2007, p. 609). The result is that even within a pedagogy that is inclusive of other cultures, European science is the dominant science discourse.

For many years and many generations, Aboriginal peoples in Canada have struggled for an equitable and respected existence in a Western society. In this time, they have been marginalized and their culture has been undervalued. This has contributed significantly to poor educational success among Aboriginal students (Aikenhead, 1997). Why is it important to address the issue of cultural neglect in science education in Saskatchewan? Without fair

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[1] Literature written by Aikenhead and Ignas tends to use the term 'Indigenous' (see page 4). Where I am referring to researched literature work, I will use this term, but in my own writing, I will use 'Aboriginal'.

acknowledgement and respect for Aboriginal ways of knowing, student achievement in science is low, as is cultural integrity. Through underachievement in this area of education and society, attitudes of racism and discrimination are perpetuated. Consequently, Aboriginal people continue to be marginalized and their knowledge continues to be undervalued. Across Canada, Aboriginal students have had low success rates in school, and this trend echoes in Saskatchewan (Ignas, 2004; Kanu, 2006). By excluding Aboriginal ways of knowing in schools all students, Aboriginal and non-Aboriginal, fail to be a part of what can be done to create a changed society that respects, honours, and values the knowledge that comes from *all* people.

There is much concern regarding the poor success rate of Aboriginal students in science; however, when one looks at the science program in Saskatchewan curricula and the lack of cultural integration, it is not difficult to see why Aboriginal students are not interested in or successful at learning what is taught in Saskatchewan science classes. Efforts to acknowledge and respect Aboriginal ways of knowing are mandated in provincial curricula through the required inclusion of Aboriginal perspectives; however, this is still not effectively achieved in schools. Through effort and initiative people can develop the ways and means by which students can learn about science in a way that meets curricular needs and is culturally affirming. Recent efforts to develop curricular materials that support Aboriginal knowledge and build inclusive attitudes demonstrate this to be an ongoing challenge.

School with its Western curricula has always been colonial (Chambers, 1999), and because of this colonial nature, Western canon has always appeared as superior education. All cultures seek knowledge, but there is a vast difference between Western science and Aboriginal knowledge and the manner in which it is approached. Acquiring knowledge in Western science is about survival and continuity; it is about "prestige, power, and progress [for] those who engage it" (Aikenhead, 1997, p. 220). Aboriginal peoples foster intimate relationships with nature as they consider themselves to exist *within* the world and to share in nature's mysteries. The approach is holistic and supportive of establishing wisdom of the world in which they live. The Western science approach is formal and conducive to mastery rather than mutual existence and sharing. The scientist is supposed to be merely an observer and interpreter of data, from which he or she makes predictions and conclusions (Aikenhead, 2001; Michell, Vizina, Augustus, & Sawyer, 2008). By studying science from a Western perspective only, students lack exposure to other approaches and are limited to only the dominant perspective. This also fails to provide

students with opportunities to learn from multiple perspectives. By limiting science teaching to Western science only we are forcing students to "accept [w]estern values and assumptions about political, social, economic and ethical priorities in the course of receiving instruction on Western science" (Snively & Corsiglia, 2001, p. 24). This sets students up to be ill-prepared for developing an inclusive and respectful attitude towards people of an Aboriginal culture and the knowledge they have. Additionally, by not connecting school knowledge and science knowledge with Aboriginal culture, the students may perceive Aboriginal knowledge to be irrelevant to their education, which may then contribute to Aboriginal students' feelings of inferiority in a dominant society.

Is there a need to resolve the differences between the different knowledge structures or to determine which is the authority? For example, can a person learn about weather forecasting through discussions with his or her elders when the elders have been collecting and sharing information over many generations? Will the Aboriginal forecast be as accurate as the current technologies that predict weather today (Gaskell, 2003)? Can both be valid and reliable? Becoming knowledgeable in Western science and understanding the mysteries of the world is not about determining who the greater authority is, or whose knowledge is of greater importance (Chambers, 1999). A complete and holistic understanding of nature comes from a view developed from the input and study of multiple cultures and the knowledge each has to offer. In the absence of sharing of perspective, the results for non-Aboriginal students is the continuing reinforcement of the superiority of Western knowledge and the devaluing of knowledge from any other culture. For Aboriginal students it is indoctrination of the perceived superior knowledge and a blatant disconnect from their culture.

Identity may be connected through culture and place such that if there is a loss of culture or place, there is likely a loss of identity. For some, it may be difficult to identify one's place as Canada has always been influenced by USA and Europe, which has erased the value of *here*. Chambers (1999) speaks of the importance of a Canadian curriculum theory that is all-encompassing of what makes us Canadians, and perhaps what helps us define what it means to be Canadian. This translates into the importance of personal values and beliefs, which are trivialized if one is always exposed to something else, such as the dominant discourse (Chambers, 1999). This is challenging for Aboriginal students who are presented with only Western science, which is the dominant science, and thus the privileged position. Disregarding Aboriginal

knowledge leads to a loss of culture and identity for Aboriginal students who are forced to learn Western science with little or no acknowledgement of their cultural knowledge. This is the occurrence in Saskatchewan (Aikenhead, 2001). By limiting science education to Western methods and content, there is a risk of developing a society of people who are not literate in science and are lacking awareness and knowledge of their culture; "the legacy of a colonialist educational system and its under-representation of Indigenous knowledge is a key factor in limiting Indigenous peoples' futures" (Ignas, 2004, p.49). In contrast, cultural strengthening and cultural affiliation in the classroom improves student success (Kanu, 2006). Problems exist when school curriculum does nothing to help one develop and strengthen the sense of who you are in terms of knowing what relevant knowledge is (Chambers, 1999). This begs the question, what can be done to improve the situation of cultural neglect that is occurring in Saskatchewan? In the science curriculum (Saskatchewan Learning, 2005) proposed solutions do not suggest that one way of knowing science should be superior to another way of knowing science. Considering the strength of Western science and the desperate need for rebuilding Aboriginal culture within itself and within the larger society, a symbiotic relationship is required. Learning Western science is not about assimilation and Aboriginal students learning Western science should not lose their Aboriginal culture and identity (Aikenhead, 2001). However, acculturation is a very real threat to Aboriginal cultures.

Aikenhead (2001) suggested three ways science education may be approached by students and the possible outcomes of those approaches: 1) students learn science that contrasts cultural beliefs and one is marginalized; 2) students neglect to learn any science in a meaningful way and do only enough to get the credit they need; and 3) through enculturation students learn science in ways that support and are complementary to their personal values and beliefs. With the first two possibilities, there is the risk of students being weak in any form of scientific knowledge as well as being culturally weak. A third possibility results in students with strong cultural identity (be it Aboriginal or otherwise) and an awareness and understanding of Aboriginal knowledge as well as modern science. It is important to note here that student initiative plays a role in the approach taken and one might see different approaches happening in the same classroom. However, the teacher has a role in this also, to facilitate learning opportunities that are culturally affirming, and thus meaningful.

Culturally affirming learning opportunities are more than simply inserting a lesson on Aboriginal culture. Respect for people of another culture means more than just being informed of all ways of knowing (Gaskell, 2003) as you cannot assume that one lesson on Aboriginal knowledge speaks for all Aboriginal groups. "Mainstream scientific and traditional ecological knowledge, like all knowledge, is created within a cultural setting" (Ignas, 2004, p. 53), therefore to properly infuse Aboriginal knowledge in a subject there should be meaningful interaction with cultural knowledge to understand that the value of Aboriginal knowledge is equal to that of Western science.

Teachers who lack cultural awareness may find it easy to neglect everything but the dominant discourse, but with the vastness of cultural perspective, even in Saskatchewan alone, and with easy access to global information, teachers are doing a disservice to themselves, their students, and society by restricting their teaching to Western science curriculum only (Martin, 1996). The demands placed on teachers to do more and include more have always been present in the field of education; however, it is worth investigating community knowledge to build cultural strength. This includes the beneficial and lucrative information as well as the past mistakes. This is not to preserve the tragedies of the past, but to ensure that these are not repeated (Martin, 1996). Meaning can come from local and historical experiences of a culture that has been denied its recognition due to colonial expansion (Ignas, 2004). In Saskatchewan, there is much value in uncovering the events of the residential schools and treaty negotiations in order for all students, regardless of culture, to understand the foundations on which our relationships have been built. Through classroom learning and the coexistence of cultures, there may be a shift in attitude such that Aboriginal students may be viewed as being advantaged within their own culture (Aikenhead, 2006). An attitude such as this could elicit mutual respect among people of different cultures and perhaps a mutual interest in engaging in ways of knowing to which one has not yet been exposed.

Regardless of the culture in which a student may stand, science needs to be applicable and relevant outside the classroom (Aikenhead, 2001). With improved curriculum and praxis, all students benefit – not just the marginalized ones. If the theory and practice are well-connected, the students will better understand who they are in the world in relation to where they are. The result is improved student and community life from which education is a step forward rather than a barrier (Ignas, 2004). In a research study of effective and influential instruction to support

cultural affirmation, Kanu (2006) suggested that "aggressive integration of Aboriginal knowledge" (p. 124) is more effective than occasional inclusion of cultural perspective. This approach is much more transformative as the room is set-up to expose, value, and honour Aboriginal knowledge using posters of Aboriginal people and Aboriginal poetry. In the integrated classroom, regular activities such as smudging, story-telling, field trips (sweat lodge), native guest speakers, circle discussions, lessons from Aboriginal perspective, and community participation were included. In the integrated classroom, the students were more academically successful, appeared to be more confident and verbal participation in class was regular and confident. When there was less than adequate integration of Aboriginal perspective, it was suggested that a lack of resources was a major contributing factor to the teacher's lack of confidence and thus there was less than adequate integration of cultural perspective (Kanu, 2006). This should be addressed with teachers in order to strengthen their skills, knowledge, and confidence in teaching from many perspectives.

Another research group worth mentioning is a team of educators from the Aboriginal Education Research Centre at the University of Saskatchewan. Their research interest was to "investigate the inclusion of First Nations and Métis perspectives in the Saskatchewan school science curriculum as a way to improve the achievement levels of Aboriginal students" (Michell et al., 2008, p. 6). The report addressed the need for a greater understanding of the role of Aboriginal science education and that the lack of Aboriginal representation in science is a significant factor in the low educational success of Aboriginal students. The depth of study required to provide comprehensive teaching resources is enormous and this report acknowledges that this task is far from completion, as demonstrated by the long list of additional research still required (Aikenhead et al., 2000). These recommendations open the door for a multitude of research opportunities to improve science education for students of all cultures in Saskatchewan.

Aboriginal science is left out of mainstream dictionaries. In Canada, the imposition of education that came with colonialism provided the foundation on which to teach science from the Eurocentric viewpoint, such that the science curricula have been constructed under Eurocentric influence. (Although, it is worth noting that recent curriculum renewal emphasizes the importance of integration of Indian and Métis perspectives. Specific learning outcomes and indicators are listed that address Aboriginal culture and perspectives. There are even some suggestions of how to do this (Saskatchewan Learning, 2005). Thus to propose a clear definition

of science as it applies to the learning experiences of the participating students, I will define science as a way of knowing and understanding how the natural world works, drawing on theory, observations, and generalizations, in a construct that has been primarily impacted by Eurocentric influence.

As an educator with research interest in the field of Aboriginal education I recognize from my experience the dominance of westernized education and neglect of local knowledge. To know where we come from and of what our country-ship is constituted cannot be complete if education is restricted to Western influences. A curriculum that is rich in cultural identity and reflective of where we exist in the world is more complete through inclusion of knowledge that was developing and has been evolving prior to colonialism. Rather than looking far and wide to make science relevant to the students, one may look at the community.

As previously mentioned, the community is considered the local connections the students have. These relationships may be personal and professional. By integrating community into the students' learning, the people in their community were available to inform them as well as be an audience with whom the students shared their learning. An example of how this happened is in the Science 10 chemistry unit. The unit was designed by the teacher to address chemistry through nutrition. Students, based on personal interests, investigated different aspects of nutrition. For example, there are many families in the community who struggle with diabetes. As this was an important issue in the students' lives and within their relationships, this relevant connection was a significant motivator in the selection of the topic and learning the actual content. Once studied, the students had an ongoing opportunity to share their knowledge with the community in efforts to improve nutrition practices and to inform community members in a way that assisted them in managing their health condition. This is a genuine way to engage in learning and inspire students to study more about their community and connect it to school learning. Furthermore, by integrating community with a typically antithetic subject such as science, perhaps students will gain a greater appreciation for, and develop an interest in science? This ties science together to the engagement factor, "relevancy".

Engagement

What About Engagement?

As with many of the terms used throughout this study, the term student engagement is nebulous. This led to considerable investigation and reconciliation of numerous papers that endeavour to define, or at least understand, student engagement. As there are many definitions of student engagement, some of which present as indicators of student engagement, further discussion is required.

The definition one uses for engagement affects the evidence one would seek to determine if students are engaged. Wilms (2003, p. 52) wrote "Student engagement refers to whether students feel they belong at school, accept the broader societal values associated with schooling and participate in school activities". Earlier in the document, he defined student engagement in reading to mean "students' motivation and interest in reading and the time students spend reading for pleasure and reading diverse materials" (Wilms, 2003, p. 8). In his definitions, student feelings and motivations are addressed. However, his indicators of engagement are if the students are present and they feel as though they belong, then they are considered to be engaged.

The question to ask first is: which of these behaviours defines student engagement and which are indicators? Furthermore, one might see that all students are attending class and feel a part of the school community, but this does not explain what they think about their learning. This also does not take into consideration the students who complete the assignments for personal satisfaction and genuine interest (authentic engagement) or those who complete assignments to achieve high marks or to prevent negative consequences (ritual engagement and passive compliance, respectively). Students may be in full attendance but may retreat or withdraw from class activity or they may be rebellious and cause disruption in the class or substitute other activities for the task at hand. In all of these examples, the students could be in attendance, feel that they belong, yet not be engaged with the learning.

Within the term *engagement*, Schlechty (2002) presented five levels that may be evident in a learning environment in any possible combination. These levels are summarized as follows. *Authentic engagement* is ultimate engagement where the learning is valuable and meaningful to the students and the students are intrinsically motivated. *Ritual engagement* has the students engaged; however, the goal for learning is driven by extrinsic motivation, perhaps by a mark, therefore students may be dissociated from the learning task. With *passive compliance*, student

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participation is mere compliance as the students seek to avoid negative consequences; the ends and the means are not connected. In *retreatism*, there is no meaning or engagement for the students and there is no attempt to comply. Students do not misbehave nor cause disruption to the class and do not substitute other activities (reading, for example) in place of the required task. In the *rebellion* level, there is no engagement. Students refuse to participate and tend to cause disruption in the class or they may substitute other activities they may find more interesting or in which they authentically engage.

Depending on many factors and influences, students can exist at the highest, most engaged level, authentic engagement, or they can run to the opposite extreme, rebellion, which, along with retreatism, may be considered levels of *disengagement*. Schlechty (2002) also noted that students might move from one level of engagement to another throughout the day, term or semester, or even within a class. Moving amongst these levels of engagement depends on a variety of influences – day, time of day, and perhaps individual circumstances.

In an initiative to increase student engagement in learning, Saskatoon Public Schools Division (SPSD) has outlined four *dimensions*[2] of student engagement, which are potency, relevance, competence, and belonging (Collegiate Renewal, 2009), all of which will be discussed later in this chapter. Student engagement was recognized through indicators such as goal setting, making connections, concentrating, a sense of control over one's learning, and feeling intrinsic rewards. The result of these events and actions was, as a consequence, student engagement. As I understand these *factors*, if the relationships are in place and the students have the opportunity to feel relevant, potent, competent, and a sense of belonging, within their learning context, they may be more likely to engage in learning and exhibit the behaviours of one who is engaged. With this understanding, potency, competency, relevancy, and belonging influence the degree to which students may engage in learning. To extend this beyond school, one might expect that one who is engaged in learning while in high school will continue this throughout life, which would likely result in a successful, satisfying, enriched adulthood.

Haberman (1991) noted that *good teaching* leads to opportunities for students to be active learners, and in contrast, typical teaching practices such as direct instruction, teacher-centred learning, student compliance, and authoritarian control in a classroom only serve to maintain a

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[2] SPSD applies potency, competence, belonging, and relevance as *dimensions* of engagement. In this study, I use those same terms as *factors* that influence student engagement. When referring to work by SPSD, I will use their term, *dimensions*; in all other circumstances, I will use *factors.*

pedagogy of poverty in which the students are the impoverished. Even though teaching may look like what teaching is, as expected by society, the community, and by parents, the students are under-nourished in their skills, abilities, attitudes, and goals. At times, good teaching is an anomaly, such that the teaching tendencies of the school and/or school division are teacher-centred, transmission types of school experiences (Haberman, 1991). Good teaching leads to increased student involvement, understanding the big ideas (rather than the facts), student input (choice), relevance, students working together, self-assessment, reflecting.

In an investigation of dropout rates, Finn (1989) considered two models that aid in understanding what leads to students quitting school at the age of 16 years or earlier. He presented the *Frustration–Self-esteem Model*, which explains that problem behaviour is due to school failure, such that the school lacks the instructional and emotional environment needed for students to succeed. In seeking success, students who have experienced failure in the past may choose to lower the bar (Finn, 1989). Much of the research shows that students are affected, academically, by their self-concept and self-esteem. The greater the number of absences, the less academic success, the lower self-esteem, the greater the problem behaviour, the fewer goals are met. This action-result cycle is self-perpetuating, and does not have to start with absences. When set goals are not met, one is likely to experience frustration, and this behaviour becomes the focal point. In circumstances where many students experience this cycle, they may find each other, and where like attracts like, dropouts flock to dropouts, which may provide a social network that is counterproductive to achieving educational goals.

To counteract this, Finn (1989) suggested that one should look to increasing the student's self-esteem, which should improve the behaviour. In the *Participation-Identification Model*, Finn noted:

> Students who identify with school have an internalized conception of belongingness – that they are discernibly part of the school environment and that school constitutes an important part of their own experience. And second, these individuals value success in school-relevant goals. (1989, p. 123)

If these students identify with the school and have the opportunity to experience success, they set goals for learning. As noted previously, by SPSD (2009), these students are likely exhibiting the behaviours of one who is engaged in learning.

Time spent in school contributes to one's sense of belonging. This includes extracurricular activities, which may also be a means to keep students attached to the school, even when they are not academically successful. "The basic premise…is that participation in school activities is essential in order for positive outcomes, including the students' sense of belonging" (Finn, 1989, p. 129). Finn's research suggested that students who participate in school activities feel a belonging with their school, which I feel may also contribute to their identity as a learner.

Student engagement can be indicated by active participation in the class (Chapman, 2003; Luse, 2002; Newman, 1981) and so we might ask what causes students to participate? Early in a student's educational career, encouragement comes from home and from classroom activities. Moving through the school career, autonomy is gained. Additionally, there might be times when one experiences frustration and unsuccessful experiences (Newman, 1981). However, under the right circumstances, negative experiences should not "interrupt the self-reinforcing nature of the cycle" (Finn, 1989, p. 130). This means that, if the student is actively participating in learning, and with the right identity as a learner, s/he engages with learning, even through times of frustration and unsuccessful learning experiences. As this is indicated by control over one's learning and goal setting (SPSD, 2009), then, in a genuinely engaged student, at times when success is not experienced, one should still see positive results. This is likely not the case with disengaged students.

Once disengaged, it may be difficult to re-engage the students. Furthermore, as students get older, an increase in external factors can draw students away from school. This may result in attention given to detrimental behaviours, rather than academic work. The cycle then flows through poor performance in school to lack of academic success to disengagement to negative behaviours, to the point where one might drop out of school (Newman, 1981). Dropping out is a sign of disengagement, where participation (lack of) precedes the action (dropping out) due to non-identification of oneself as a school-learner.

Dodd (1995) identified the class environment as a significant resource, where a teacher facilitates engagement by talking with the students, trusting them, and viewing them as individuals who will make sense of their learning in their own unique ways. The students need to personalize their learning, which includes choice, autonomy, relationships, and reflection. They need to have ownership and personal power, "a belief that what they do will make a

difference" (Dodd, 1995, p. 65). This connects engagement to intrinsic motivation, is reminiscent of potency, and presents engagement as being individual. Luse's findings (2002) support this through use of a writing strategy that allowed students to reflect on and write their own ideas with no pressure to perform.

Vibert and Shields (2003) indicated that engaged students lead to improved schools, where the proximal variables are instruction, inter-school relationships and distal variables involve policy and legislation. Essentially, student engagement is a top-down approach where the most impactful efforts are the actions in the school – student engagement comes from school effectiveness and school improvement. The problem Vibert and Shields (2003) found with this was that student engagement was caused by what the schools were doing. The implication was that if student engagement occurred then it was because the student engaged in a task initiated by the teacher, and if there was no student engagement, it was due to lack of interest or motivation on the part of the student. As I understand it, this means that student engagement, when successful, comes from the school and when there is a lack of student engagement, the problem lies with the students.

Dodd's (1995) point was that student engagement develops from the appropriate learning atmosphere, which supports the notion that student engagement starts as a seed planted in a school; however, student engagement blooms within the student, who participates in the learning environment. While this indicates a strong relationship between student and school, with the school being a foundation, it should be understood that student engagement is ultimately an internal element and comes from within the student. One might find that if the school is successful in creating an engaging environment and if students are engaging in learning then one might applaud the school for laying the foundation; however, the loudest applause should be directed to the student who has developed and maintained a learning lifestyle of engagement.

A bottom-up approach is needed as student engagement is superficial when one looks at what is happening in the school, in the policy, and in the practices, rather than what is happening *in the student*. Recalling the levels described by Schlecty (2002), one might suggest that the student is engaged, at one of three possible levels of engagement; however, this lacks depth as the levels of engagement range from authentic to ritual engagement to passive compliance and these levels are based on observations. Considering only obvious behaviours, such as students performing assigned tasks quietly and without resistance, and getting the answers right, the

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actuality of student engagement is misperceived. One might observe the student to be engaged; however, engagement might only be an appearance.

Vibert and Shields (2003) viewed student engagement through three different lenses. Viewing student engagement through a *rational/technical* lens, one notes that the goal here is to prepare students for post-secondary education or employment. Success is indicated through academic scores, which are teacher-centred or subject-centred activities that are used with the intent of creating opportunities for students to become good citizens. Fearing that students will not have the initiative to do this, the responsibility for creating opportunities rests with teachers (Vibert & Shields, 2003). Then, in a passive way, student engagement is indicated through participation and standardized test results. Since high test results can likely be achieved through passive compliance and ritual engagement, how would one ascertain that authentic student engagement has occurred?

An *interpretive/student-centred* lens envisions that education is for lifelong learning. Students pursue individual interests, are viewed as capable, and are given responsibility; they have autonomy and are given choice within the learning approach (Vibert & Shields, 2003). For example, a student may engage in writing because he has chosen to write about a topic that is meaningful to him. This fits with an earlier point made with Chapman`s research (2003) that considers a student-led approach to learning; however, is it possible that one would find authentic engagement happening here? This moves closer to student engagement being internalized within the student, but depth of engagement within the student may still be lacking.

Chapman's discussion of definitions of student engagement (2003) fit with this perspective. She presented "time-on-task" and a "willingness to participate in routine school activities" (Chapman, 2003, Student Engagement: Clarification of Terms section, para. 1) as indicators of student engagement, which included attendance, homework responsibilities and attention to the teacher. A later definition by Skinner and Belmont (cited in Chapman, 2003, Student Engagement: Clarification of Terms section, para. 3) was based on cognition, behavioural, and affective components:

> Engagement versus disaffection in school refers to the intensity and emotional
> quality of children's involvement in initiating and carrying out learning
> activities…Children who are engaged show sustained behavioural involvement in
> learning activities accompanied by a positive emotional tone. They select tasks at

the border of their competencies, initiate action when given the opportunity, and exert intense effort and concentration in the implementation of learning tasks; they show generally positive emotions during ongoing action, including enthusiasm, optimism, curiosity, and interest. The opposite of engagement is disaffection. Disaffected children are passive, do not try hard, and give up easily in the face of challenges… [they can] be bored, depressed, anxious, or even angry about their presence in the classroom; they can be withdrawn from learning opportunities or even rebellious towards teachers and classmates.

This statement of engagement brings depth to the definition – it involves more than simply attending school and completing assignments. Student engagement considers how students approach their learning, the effort they exert to be successful, and how disengagement leads to particular behaviours in the classroom that are counter-productive to learning. Chapman settled on a definition that included cognition, behaviour, and affective domains, stating "students' cognitive investment, active participation, and emotional engagement with specific learning tasks" (2003, Student Engagement: Clarification of Terms section, para. 4). In this definition, there is greater depth in that a psychological aspect is considered, as well as a behavioural, which increases the students` investments in learning.

The *critical/transformative lens* (Vibert & Shields, 2003) considers the policies upon which education is built. In experiences from this perspective, the teachers and students faced challenges and controversies head-on. They dealt with *hot topics* such as gendered language, shop-lifting, and the stigma of poverty. The curriculum was *critical practice* and students engaged in it (Vibert & Shields, 2003). Engagement, from this perspective, is more than presenting school as a warm and welcoming place for learning opportunities. The foundation is laid and the students bloom through participation, choice, activism. If one were to talk with students about this experience, behaviours such as goal setting, making connections, concentrating, control over one's learning, and feeling intrinsic rewards would likely be present. There is much research addressing critical pedagogy of place, where students learn first to know their place, then examine it, and because of their knowledge and love of that place, they seek to make it a better place to live.

To remove ambiguity surrounding the term student engagement, for my purposes, I suggest that school and its foundation of being a nurturing and welcome place are critical.

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Students bring many things to school, such as values, beliefs, experiences, and influences from their homes and communities, so subconsciously or not, community has a great influence in one's education experiences. Without a community structure, students may find it difficult to have a base on which to build their learning. If one considers that engagement exists within each person, the school can play a disruptive role, too. However, if a nurturing school extends into the community, where there is encouragement and support, and additional locales (i.e., individual homes, all learning centres in the community, and outdoor classrooms) students have much opportunity to engage in learning experiences.

By having a community of support and encouragement, one notes the significance of relationships. Again, this is unbounded as there can be numerous people involved, from school administration, teachers, family members, peers, and other community members. Educational practices, curriculum, and policy also have their place in fostering student engagement as teaching strategies, activities, and assessments are needed to initiate opportunities for students to become engaged.

Ultimately, student engagement is internalized within individual students. It is supported and developed through factors such as relevancy, competency, potency, and belonging, and can exist at varying levels, where authentic engagement (Schlechty, 2002) is the greatest depth of engagement. Participation is more than simply attending school and a sense of belonging develops due to the presence of structures and relationships within a school or classroom (relational) community. Student engagement manifests through behaviours such as questioning, taking learning initiative, goal setting, concentrating, and *getting excited* about what one is learning.

Student Engagement and Inquiry

Searches for papers in education databases revealed that student engagement has been a research topic for many years and has been connected to many aspects of education. Examples of these aspects are (and not limited to): class management, teacher practices, school relationships, online learning, student achievement, motivation to read, and literacy in other subjects. An attitude of engaging in learning is conducive to lifelong learning, which in turn likely leads to successful post-secondary life experiences and rewarding career goals. These successes would be demonstrated by a society of educated and inspired people who possess the

skills to be critical, problem solvers, and autonomous beings. With student engagement being a common goal for the multitude of research efforts that report on and seek to increase student engagement, what makes my research different?

The results from the Programme for International Student Assessment (PISA) report (Student engagement at school: A sense of belonging and participation: Results from PISA 2000; Wilms, 2003) clearly identified its understanding of and approach to investigating student engagement, yet I think it may have missed the mark. The definition of student engagement as a sense of belonging and participation (based on attendance) left out the part where students actually take an interest in the material they are studying. Schlechty's (2002) breakdown of behaviours, as seen in authentic engagement to passive compliance as positive indicators of engagement, and behaviours seen in rebellion and retreatism as negative indicators of engagement, may all occur when students attend school. Thus, the students, feeling as if they belong and attending school on a regular basis, are engaged, in some way, in learning. However, engagement in learning is much more than attending class and following the teacher's instructions or completing an assignment or worksheet. It is about genuine curiosity and inspiration to learn without being satisfied that information transmitted from an authority must always be correct. Learning should be meaningful, and it can become meaningful by discovering about something one is interested in and connecting to it as it affects the world around us as well as making a personal connection. Engaging in learning is about knowing that one does not yet know something and then going to actively seek the information. Based on this understanding, authentic engagement is what counts.

In an interview with Ron Brandt (1995), Alfie Kohn addressed student engagement. Rather than using reward and punishment to manipulate behaviour, classes that engage students will be reduced classroom management issues. Conditions used to control behaviour are ineffective, yet students who are motivated to learn and are engaged in the learning will likely not misbehave and will likely participate in long-term learning experiences. Therefore, it is important to determine if the task is being completed simply to acquire the reward (ritual engagement), avoid the consequence (passive compliance), or if the student is genuinely motivated to learn (authentic engagement) (Schlechty, 2002). If it is anything but genuine motivation to learn, perhaps the task needs to be altered. However, there will likely be times when learning is boring and students should be willing to participate in the boring parts of

learning. If the bigger picture of learning engages them, then persisting through the boring parts may not be so daunting. Could engaging in learning motivate students to persist through the boring parts? Should students believe that learning is not supposed to be *fun* all the time? If the reason for learning is part of a picture bigger than the task at hand, then one might even understand that achieving the bigger picture requires some time and effort on tasks that are less interesting or less engagement-worthy. If one wants to succeed, then engagement is important.

Kohn suggested that motivation comes through *content, community,* and *choice* (Brandt, 1995)*.* With these elements working together, students are likely to be intrinsically motivated to learn. The words of Kohn echo throughout this research project as it reflects the learning opportunities in the approach being used to teach grade 10 science. The *content* is the relevance of the science topic as it applies to the local (geographical) *community* and other nested communities (i.e., relational) in which the students live, and by determining their own inquiries, students were given *choice* in their learning. By addressing these ideas together, it was anticipated that the learning would be engaging because their inquiries were important to them, decided by them, and close to them and their community(ies).

The goal is to have students participate in a learning program that inspires their own desire to learn without behaviour manipulation. As it is not likely that all students will be interested in everything all the time or interested in the same topics, choice in learning will likely allow each student to investigate a common topic in a context that meets their individual learning interests. One way to accomplish this is to use inquiry and connect it to community.

Perhaps engaging in learning happens when the students can touch, listen to, smell, and reach out to what surrounds them on a daily basis. Looking at science through a community lens, the learning may be relevant and meaningful if it applies to the local community rather than studying about science in places in which the students cannot walk or are unfamiliar to them. *Place-based learning* or *pedagogy of place* involves the study of the community(ies) in which one lives. Resources for students go beyond the classroom and into other aspects of their lives. Schools that facilitate place-based learning have shown improvement in student learning and engagement (Powers, 2004). By using inquiry and community connections, the students may participate in learning situations that are meaningful to them. Allowing students to direct their learning by asking their own questions gives them the opportunity to investigate what is important to them. This is a contrast to learning events that are far removed or disconnected

from the students' lives (Somnath & Frazier, 2008). Relevant topics that are meaningful to the students become valuable learning opportunities and are stimulants of engagement. With appropriate guidance and scaffolding, students will likely develop the skills and abilities to better construct their own learning. Students may leave school with the ability to be successful in life experiences and more able to overcome challenges.

Engaging in learning exists within a person, yet it could not exist without influential factors. SPSD (2009) has identified *belonging, potency, relevancy,* and *competency* as influences of student engagement, and I considered these factors when I first developed my understanding of student engagement and when I first spoke with the participants.

Factors of Engagement

Belonging.

Belonging is noted to be an important part of the school atmosphere. In the foreword of the 2000 PISA report Wilms (2003) presented a definition of belonging that included friendship, relationships with teachers, and identifying with school values. This also included acceptance by peers, being a member of society, and a sense of whether or not one belongs at school. Sagor (1996) noted that belonging means that students are "valued members of a community" (p. 39); belonging is a connection between people over a life span and should be in our schools and neighbourhoods (Brendtro, Brokenleg, & Van Bockern, 2002), which are two nested aspects of "geographical" community. Considering the amount of time youths (should) spend in school, school may likely be a significant community, thus belonging is central to a positive educational environment (Brendtro et al., 2002). Additionally, one's feeling of acceptance may include experiences in different communities (home, school, and others).

By using the term *community*, I imply that belonging may be experienced in different ways. Some examples of where one might feel s/he belongs (and are not limited to): one may *belong* to a sports team due to the camaraderie and common athletic goals or feeling valued by the team; one might *belong* to a culture or religion in which there is a common spirituality and an acceptance of one another's beliefs. One may feel s/he *belongs* to a school where comfort, safety, and welcoming are felt, or one might feel *belonging* to a town where people work together, are supportive of and respect each other. Osterman (2000) noted that much of the research shows

that schools should be centres for caring and support, and that a community atmosphere is conducive to feelings of belonging. The research indicated that by feeling that one belongs, there is a greater likelihood of school success, academically and socially. Osterman's (2000) definition of belonging relied more on feelings of acceptance rather than friendship, which does not negate friendship, but considers a broader circle of belonging. For example, a student may not necessarily have a personal friendship with another student, but may still feel accepted within the broader circle of the community in which they both have membership. The connection between community and belonging, wherein belonging encompasses the way a person feels through membership in a community, which could be any parameters that provide acceptance, welcoming, safety, caring, support, value, and respect.

The importance of belonging was also noted by Hamm and Faircloth (2005) who said that belonging is about friendship and is a perception of one's importance in a community (a school community, for example), such that s/he is "liked, respected, and valued by others in the school" (p. 61). They also suggest that belonging is preventive against high-risk behaviours and has a positive influence on student engagement. This concept supports Wilms (2003) who considered that students' feelings of belonging affected their performance and potential for success in school. Thus, with a heightened sense of belonging, students should experience educational success.

For the purposes of this study, belonging is defined as the sense that one has membership in the given community. For the students, it is the welcoming, safety, acceptance, support, and respect they feel when they are in the school, among their peers, in their groups, and with their families and/or in their town. This may even be reciprocated - if one feels s/he belongs, then s/he can welcome another into the given community also.

Relevancy.

Relevance in education refers to meaningful learning experiences. Shernoff defined relevancy as "interest, concentration and overall engagement [that] is above average and significantly higher when… instruction is important to themselves and their future goals"(2002, Findings: when do students become engaged in classrooms section, para. 5). The definition used by SPSD is learning that is "meaningful and interesting to self and world" (Collegiate Renewal,

2009, Relevance section, para. 1). To make learning relevant, there needs to be a connection between course content, classroom activities, assessment, and out-of-school life. This is key to a meaningful education because in the absence of relevancy, motivation to learn does not exist (Glasser, 1969, as cited in Rensch, 1977). When students ask about the importance of what they are studying, this indicates a disconnect between the students and the content, at which point the students are likely unmotivated to learn, thus disengaged. The teacher may then take the time to help make the connections, or proactively provide learning experiences that make for meaningful, relevant learning. An example of relevant education is seen in environmental studies, where Tilbury (1995) noted that by connecting personal life to the bigger world, students can better understand their position in the world, thus meeting their individual needs while preparing them for life outside of school. The learning was connected to personal life via environmental stewardship.

For the students in this research study, relevance was most important to their science learning experiences. Class content and learning tasks were intended to connect in-school learning and out-of-school living. For science to be relevant, what happened in class needed to be seen, understood, and / or be a part of the students' lives once they left the classroom each day. The research teacher prepared science units with the intention of having the students apply science concepts to their out-of-school lives. A chemistry unit in which the students investigated nutrition in an area of personal interest, a physics unit in which the students investigated motion and travel in their local (geographical) community[3], and a weather unit in which the students studied weather patterns and phenomena in their local (geographical) community were ways he anticipated science to be(come) relevant to them.

For the purposes of this research, relevancy is the connection between curriculum and meaningful learning where the students are presented with opportunities to study the curriculum in ways that tap into what is interesting and important to them, in school as well as in out-of-school living. Since individual interests vary among students, students must be given choice in what they study, which can be accommodated by using a method that allows them choice, such as seen with *inquiry*. For these students, the science curriculum was the focus of relevancy.

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[3] It is important to note that the units were not completed to the depth the research teacher had planned, which was due to the need to complete as much of the science curriculum as he effectively and possibly could.

Potency.

The term potency may be defined (Sagor, 1996) as having feelings of value and worth, or one who has a sense about him/herself such that his/her contributions and knowledge are valuable and worthy. The experience of the grade ten students was the right opportunity for them to gain or increase their sense of potency through positive and successful learning experiences, accomplishment, invitation to contribute and participate as an independent learner, and opportunities to study areas of interest. There is an obvious connection between potency and relevancy as one's potency develops through meaningful contributions. The topic of choice may be relevant; however, when one can make positive changes or contribute in positive ways, then potency is likely to be achieved. When choosing topics of study, the students not only chose areas of study that were meaningful, but they also chose to share what they were learning with people in their community. By first asking the students to investigate an area of interest and by sharing what they learned with people in their community, they could see first-hand that their contributions were valuable. Some students shared information for the purpose of improving their health and that of family members and others shared information to teammates to improve sport performance. In either case, what was learned and thus contributed to was a reflection of the students' sense of value and worth; their potency. Considering the bigger picture, if students see not only the relevance of studying science but also how learning science can help them contribute in meaningful ways, then students may feel potency as a scientific person.

Competency.

One definition of competency is the "attributes of a person, such as their knowledge, skills or abilities" (Hoffmann, 1999, A definition of competency section, para.12). This definition requires individual input, outcome, assessment of that outcome, and [ideally] feedback (Hoffmann,1999). This allows for the development of oneself through their actions and performances. Schunk (1991) suggested that *self-efficacy* is "an individual's judgments of his or her capabilities to perform given actions" (p. 207) and related to education, it may influence behaviour, motivation, and achievement. Students' communities are their schools, homes, and communities, and they should not only develop competency as they interact in these

environments, but they should also be able to assess their competency. As suggested by Schunk (1991), students may come to appraise their competency via many sources. Some of these sources (not exhaustive) may be personal (perceived effort, value or relevancy of the activity or outcome), situational (task difficulty, history of success or failure), or feedback-related (extrinsic rewards, feedback). With this in mind, students develop a perception of their competency based on, for example, feedback from a teacher, a mark on an exam or assignment, a reflection of their effort, the importance of the activity, and how they have performed in the past. All of these sources inform the students of how well they can perform a given task, and the results of this judgment further influence their motivation to perform again or engage with a similar task. Perhaps understanding their own competence motivates them to attempt something entirely new. My perception is that competency can be interchanged with self-efficacy, and by considering these two definitions, my understanding of competency is one's perceptions of his or her abilities to perform a specific task or action while engaged in a relationship with the environment in which s/he is involved.

When looking at *competency* and *potency*, the term confidence comes to mind as it may apply to both concepts of one's self and one's learning. If one is competent, s/he should feel confident; however, a child might not recognize his or her competence and so lack confidence. Both competence and confidence are necessary. As well, if one feels a sense of potency, s/he may feel confident that the task or activity has the value that makes it important and worthy. These beliefs about oneself are significant motivators for goal accomplishment. Is it possible that believing one of the two concepts is sufficient to carry one through, perhaps until the other develops? If a student believes that learning science is valuable to a future goal, then s/he may have the motivation to work through the boring parts of the topic or the difficult parts. Additionally, feeling competent about one's abilities may motivate a student to pursue something of interest until s/he realizes the value and worth of what the activity means.

Summary of Applied Definitions

Community: a set of relationships that can be geographically, or personally bounded. Community could comprise the town, the school, family and other groups (sport team, online community), and perhaps even the land.

Inquiry: knowledge creation via generation of questions for synthesis, integration and presentation of results. Levels of inquiry may include *structured inquiry* (the teacher takes the students through the task to a prescribed endpoint) and *guided inquiry* (the teacher provides less guidance to the students to allow them opportunities to develop skills essential to conducting an inquiry).

Science: an attempt to understand how the natural world works, drawing on theory, observations, and generalizations. The theories from mainstream science (i.e.: those in the curriculum) were produced through Eurocentric influence.

Belonging: membership in a given community.

Relevancy: the connection between curriculum and meaningful learning, which requires studying topics that students find interesting, important, and connected to out-of-school living. Relevancy pertaining to science is that science concepts and understanding learned and applied in class have meaning, value, and connection to the out-of-school living.

Potency: a sense that students' learning and contributions have value and worth.

Competency: a perception of one's abilities to perform a specific task or action while engaged in a relationship with the environment in which s/he is involved.

The Question

This research was initially designed to investigate the ways in which students engage in learning, but the students' interviews revealed more than I anticipated about their perspectives on engaging with learning. The external factors influencing students were proposed to be community, science, and inquiry method teaching. The internal factors were proposed to be potency, relevancy, competency, and a sense of belonging; however, I anticipated that additional internal factors would emerge from the students' words.

The participants lived in a Métis community that is geographically isolated in the province. Much like the other students in the community, their study of science was primarily the dominant Western discourse, with cultural content infused where possible. On-time graduation rates in this community tend to be low, so this community, under these circumstances, was worthy of study. An inquiry teaching method was used to provide an opportunity that was likely different from the participants' usual school experience. Inquiry was the instructional

method used by the research teacher. It was conducive to an *interpretive/student-centred* approach that was intended to assist the participants in engaging with learning science by bridging culture, curriculum, and community, and thereby could be instrumental in influencing improved outcomes. The question driving this research was: to what degree was the engagement in learning of grade 10 students in a northern Métis community affected by their sense of belonging, relevancy, competency, and potency?

CHAPTER 2 – INVESTIGATING STUDENT ENGAGEMENT

Children have real understanding only of that which they invent themselves, and each time that we try to teach them too quickly, we keep them from reinventing it themselves. - *Piaget*

To what degree was the engagement in learning of grade 10 students in a northern Métis community affected by their sense of belonging, relevancy, competency, and potency? This question was investigated with grade ten students who were attending a school in a small northern Métis community. The teacher of these students wished to improve student engagement and to facilitate this he opted to teach science using inquiry. His further intent was to strengthen the connection between community and learning. Overall, he hoped that by using inquiry to teach science, he not only covered curriculum content, as required by the Ministry of Education, but also provided the students with learning opportunities that were meaningful and relevant to their lives, and more engaging. Combining this with math, where possible, he used two-hour teaching blocks with a five minute break after the first hour.

To explore student engagement to the depth I wanted, a quantitative study would not have been sufficient. Tracking attendance, as performed in the PISA study (Wilms, 2003) would only have told me who was present in the class at a given time and would not have adequately informed me as to the learning and engagement that was happening. To get a sense of whether the students were engaging in the learning and how they were engaging, and to gather rich data from the participants, it was essential to speak with them about how and to what extent they engaged in learning, thus case study was the method of choice.

Case Study

Case study was selected, as it is an appropriate research method for use in education where innovations are being implemented (Lancy, 1993). This was a suitable choice as the context of the study involved a teaching innovation that was anticipated to be influential to student engagement. In addition, case study allowed for collection of both qualitative and quantitative data. This was important as I looked at, informally, quantitative aspects of student engagement, such as student attendance patterns. Even though this is qualitative research, attendance records and reasons for absences were considered in relationship to the students' thoughts about engagement. For example, if participants said they were authentically engaged, it was interesting to note their attendance, and likewise for those who said they were in stages of disengagement (retreatism and rebellion), especially if they had a high attendance record. Why would a student with low attendance describe himself or herself to be engaged, or conversely, why would a student attend every class regularly yet claim to be disengaged? Using case study to connect aspects of engagement, as described above for example, could be informative to the teacher and to other learning communities.

Another feature of case study that is important to this study is the sampling process within a specific population (Gerring, 2007). For example, the sample population may be as large and as broad as a student body within an educational community (perhaps the students enrolled in the College of Education at the University of Saskatchewan) or it may be as small as one non-Aboriginal student learning Cree for the first time. The decision for the sampling size and other specifics rests with the researcher based on what he or she wishes to study.

The five participants were recruited from a class that had many commonalities. With few exceptions, the students were in grade 10 and were members of the same homeroom and lived in the same town (geographical community). They were registered in periods one and two, Science 10 and Math 10, respectively. The classes were taught by the same teacher, who in an attempt to increase engagement, used inquiry as the teaching method. To make further connections in learning, he integrated content and activities between math and science as much as possible. Arranging the homeroom and class timetable was predetermined as the approach offered consistency by having the same teacher and perhaps facilitated a sense of community that may have built by having the students together, first in the homeroom and second, by embarking on

an inquiry study together. Scheduling the classes back-to-back also allowed the teacher continuity of instruction, if more time was needed to extend activities.

Through observations and interviews, my intent was to determine the extent to which the factors of student engagement influenced the participants. This was achieved through case study as a means to investigate student engagement in terms of how deeply they engaged in the science class (using the levels described by Schlechty, 2002); what influenced that engagement; and whether they believed science connected to their out-of-school lives. Through case study method, I observed the students and teacher, and I interviewed the teacher and the participants. During the interviews, we discussed the factors that influence student engagement, but in their terms. I did not ask them if they felt competent, or potent, for example. I asked them questions that allowed them to speak about the factors as they pertained to school in general and to specific subjects they were studying at the time of the research or had studied previously. We spoke about relevant learning experiences, what was meaningful to them, what brought them to school each day, their future goals, science relevance in their lives, and their perspective of community. The third interview focused on student engagement. I first discussed with the participants the levels of engagement (Schlechty, 2002) and then asked them to identify their level of engagement regarding school and specific classes. Additionally, we spoke about responsibilities regarding their learning and their goals.

It is important to note that case study does not permit generalization across populations, and this statement holds true for this study. However, the teacher may likely use the results of this study to inform him regarding methods and means by which to engage students in future science classes. School administration may use the results of this study to inform them about the fluctuation of student attendance or student population from one grade to the next. Regardless of the results of this study, I anticipate that future study of student engagement is not only possible, but essential.

The Students

For the purpose of investigating student engagement, sampling came from a grade 10 class that was participating in a learning experience that was likely new to them. They were studying science by using inquiry and with community connections. The invited participants came from a class of grade ten students. Prior to the invitation to participate I visited the school

and spent time in the classroom listening to, talking with, and assisting students during class. In order to become a familiar person and to establish trust with the grade 10 students, I visited the class two days each week for approximately twelve weeks, beginning in September 2009. I was present in the class on Thursdays and Fridays for the first two periods of the day as those were the Math and Science periods. For the remainder of the day, I volunteered in the school (in other classes, with other teachers and students, on field trips) and within the community (volunteer staff during a provincial tournament, an actor in the school Christmas celebration). This time was used to form relationships among the students and to become a comfortable presence in the classroom, school, and community. I requested to be on a first-name basis with the students and was introduced as a teacher and researcher from Saskatoon. This was important as I wanted a casual, yet professional relationship with the students. I did not want them to put me in a position of authority as one might find between a teacher and his/her students as it may have affected their willingness to participate or to openly discuss matters of school and learning with me. With permission from the teacher and administration, I began making observations.

Looking first at the entire class, some of the students had consistently progressed through grade levels, with some excelling and others meeting required standards. Other students were repeating grade ten classes, even more than once. The students may have been as young as 15 years old and as old as 18 or 19 years of age.

There was a broad range of attendance and academic success among the students in the class. Some attended regularly and absences only occurred with sport events and other school-related activities. These students tended to show higher success in terms of obtaining credit for the class, and with higher recorded marks. As regular attendance decreased, as was noticed with some students in the class, credit may have been obtained; however it was usually achieved with a lower recorded mark. Students with sporadic attendance typically did not successfully pass the class. In discussion with the grade 10 teacher, he predicted success with some students, based on their behaviours and previous successes.

Culture and sport activities are important as many of the students in the class participate in physical activities, especially competitive team sports, with a few competing at a national level. Many of the students participated in cultural activities such as jigging, beading, and playing the fiddle. One student mentioned that he has lived *in the bush* with his uncle for weeks at a time.

In October 2009, I was granted ethics approval. On my next visit, I addressed the grade 10 class and distributed an information letter and consent forms to the students. I informed them of my intent, which was to study how students engage in learning when learning occurs through inquiry and is connected to community. They were asked to take the information letter and consent form home to discuss with their respective caregivers. For those under the age of majority, approval from a parent or caregiver was required. All students in the class were invited to participate. I asked the teacher and school administration to collect consent forms in my absence although it was important that they did not know who was participating. To maintain anonymity, all students were asked to complete the consent form and check 'yes' to indicate consent to participate or 'no' to indicate they would not participate in the study. By having all students return forms in a sealed envelope, the teacher or administration was able to collect the forms in my absence and would not have known who had consented to participate. Some consent forms were returned the following day, so I prepared to conduct the first round of interviews the following week.

The Participants

Return of the consent forms gave me a participant population of six students; less than half of the forms were returned. Regrettably, one of the students who signed on subsequently left school and despite my numerous attempts was unable to be reached, which was unfortunate as her words likely would have added significantly to my research. This left me with five students with whom to conduct this study.

Of the five remaining students who consented to participate, I considered two - one male and one female - to be strong students because they attended school consistently and their grades were high. Absences from class were due to school-related sport and other extra-curricular activities. A second female, 3B, who was also successful in obtaining credits for both science and math, had the least absences and lower marks than the two previously mentioned.

With these three participants, I was able to conduct interviews on the schedule I had planned. The first interview was held in early November, the second in mid-December, and the third at the end of the semester. The time in between interviews was intentional as I wanted to speak with them mid-way through the class as this was an opportunity for them to share their

thoughts and ideas as the class progressed. I also wanted the participants to experience the entire class before the final interview.

Of the two remaining participants (one male and one female), I considered them to be irregular attenders, both of whom did not perform well academically. When they did attend class, they were not disruptive. Completing the interviews with them was somewhat challenging as it was difficult to predict which day they would be in attendance. Fortunately, the male did attend school at the start of the second semester so I was able to conduct interviews II and III at the same time. The female had dropped out of school and after numerous telephone calls to her home I was able to arrange a time to meet with her. I visited her at her family home and conducted interview III with her in the presence of her parents. She informed me that she had left school due to a family illness (she had been providing care to an ailing grandparent and was thus unable to maintain regular attendance at school). She expressed a desire to return to school in the following year, and her parents expressed their support and encouragement with this decision.

This set of students covered a range of participants with maximum variation for attendance and for academic results. There was a group of students who also attended irregularly, sat together, and attempted to disrupt the class. This group is unfortunately not represented in this study as none of them consented to participate in the research.

The five participants will be identified as Student 1 through 5. Further designation indicates grouping where 'A' is a high-achieving student, which means the student has high attendance and high grades (above 80), 'B' indicates average marks and less diligent attendance, and 'C' indicates below average or failing marks and frequent absences. Thus, the final identifying designations, which are known only by me, are 1A, 2A, 3B, 4C, and 5C. In summary, the participants were as follows:

Participant 1A: a female with high attendance and high marks. At the time of the research, she was active in sports and most absences were due to school-sponsored events.

Participant 2A: a male with high attendance and high marks. At the time of the research, he was active in sports and absences were due to school-sponsored events.

Participant 3B: a female with average academic achievement and high attendance; absences were due to school-sponsored events or illness.

Participant 4C: a female with low academic achievements and had low attendance. Prior to completing the interviews, she withdrew from school (but not from the study) to care for an ailing family member.

Participant 5C: a male with poor attendance and low academic achievement.

Observations

With permission from the teacher and school administration, I acted as a participant observer in the classroom during my visits. I participated in learning activities, interacted with the students, and took field notes of my observations. The purpose of the observations was to look for evidence of student engagement itself, as well as signs of other factors of engagement (belonging, competency, potency, and relevancy, for example). I noted the actions of the teacher, student behaviours, and interactions among everyone. I noted seating arrangements and changes in the classroom atmosphere, depending on who was present in or absent from class. The purpose of me acting as a participant was to develop professional relationships and trust with the students in the class. It was important that they behaved naturally in my presence, which as a participant observer, my presence became less intrusive.

With the support of the school board and administration, the research teacher offered learning opportunities that connected classroom to out-of-school life. The grade ten students participated in three units of study that were connected to community. The first unit of science was chemistry, which centred on nutrition as students participated in a guided inquiry. The teacher guided them through determining a research question after exposing them to various elements of nutrition. This allowed the students to choose an element of nutrition that was personally interesting while providing the teacher with the opportunity to connect their interests to chemistry in attempts to deepen their understanding of nutrition and chemistry. The second unit of study, motion, was approached through *structured inquiry* but was equally connected to out-of-school life. In the second unit, the teacher did more scaffolding with the students, which allowed for better progress, although he did have to shorten the unit by omitting some activities in an effort to make time to complete all required units. The connection to community was limited due to time. He had planned for a student investigation into distance and personal mode of travel within the community, but was unable to get this far. The reason for moving to structured inquiry after guided inquiry was due to the low success that occurred with the

previous unit. The teacher was dissatisfied with the outcome of the guided inquiry, and thus the unit. Part of the lack of success was attributed to poor student attendance. (It is important to note that attendance fluctuated greatly among the students, which made it difficult for flow and continuity of teaching to occur. The students who did not attend regularly lost the benefit of regular instruction, conversations, and time-on-task; the students who attended regularly lost the benefit of consistent progress due to the challenge of presenting day-to-day lesson plans for those students with irregular attendance. There was also much concern about being able to meet all curricular objectives within the semester.) For the weather unit, the students were guided through learning activities about weather and severe weather events. The connection to community should have been obvious as the students monitored local weather and applied concepts where it was suitable.

The Interviews

The interviews took place over the duration of the first semester. This was purposeful as I wanted to gather the participants' thoughts over time, which would have allowed me to notice development or change of ideas throughout the research term. We met in a small office located in the commons area. The interviews took place when classes were in session. There was little activity in the hallways and few people around who could witness me speaking with the participants. Since my presence in the school had become a regular occurrence, along with assisting teachers and students, as needed, if someone did see us during an interview, it may well have been viewed as an informal discussion or a tutoring meeting. These steps were taken to further ensure anonymity.

All interviews were audio-recorded, with note-taking at the same time. Following each set of interviews, a transcript was completed and the final step for the participants was to review the transcripts for accuracy and completeness. All the participants signed-off their transcripts for analysis.

There were three sets of interviews in which each student was asked the same set of questions, although some may have been reworded to fit the context of the conversation to ensure understanding and clarity during the time of the interview. This provided consistency within questioning and allowed me to gather data from different perspectives. Further questions may have been asked as probes or if responses took an unexpected turn. Even though I had

planned for a particular sequence of questions, I did consider the responses of the participants in the preceding interview as a means to inform the following set of interview questions. A list of the prescribed questions can be found in Appendix C.

The first set of interviews occurred in early November 2009 and was an attempt to determine whether students felt their science class provided learning opportunities that were relevant to the students (relevancy). Additionally, questions were asked to uncover their sense of accomplishment (potency and competency), their reaction to having choice in inquiry learning activities (competency, relevancy), connections between school-life-community (relevancy), and potential opportunities in their school and community (belonging). The results of each set of interviews provided guidance for the formation of questions for subsequent interviews.

The second set of interviews occurred in mid-December 2009 and focused on questions about community, culture, having choice, future plans, motivation, and learning responsibilities. Since the structure of the semester was centred on inquiry learning and community, it was important to understand the extent of the students' feelings of community and belonging.

The third set of interview questions occurred in mid-January to mid-February 2010 and focused specifically on engagement. I showed the participants different levels of engagement, as defined by Schlechty (2002) and we addressed their position regarding their current classes or classes they studied previously. We also discussed how students stay engaged with learning and the responsibilities one holds in his or her learning and how much responsibility is placed externally (i.e., on the teacher, parents).

Additionally, impromptu questions were asked in response to participants' statements in order to prompt student elaboration or explanation. At times, participant responses simply warranted discussion of something I had not anticipated. I also wanted to know the extent to which the participants' engagement in science had changed over the course of the semester, in any way, due to the inquiry approach their teacher used. If they were previously unengaged in science, did this change and what inspired the change? If the students already perceived themselves to be engaged in science, did their engagement change or remain unaffected? If it changed, in what ways did that happen?

Interview Transcripts

Throughout this paper, participants' words will be paraphrased or will be quoted directly. The citation is as follows: participant identifier (1A, 2A, 3B, 4C, and 5C); the interview number (I, II, or III); and the line number(s) of the transcript (216). Example: (3B: II: 216-220) refers to participant 3B, second interview, and lines 216 to 220 of the transcript.

Ethics approval granted me the opportunity to interact with, observe, and interview five participants in order to uncover the extent of which they engaged in learning Science. The case parameters are that the students live in a small northern Saskatchewan Métis community. They are all in grade 10, either for the first or an additional time. Their teacher chose to teach Science in a way that used inquiry and connected it to their community. In a classroom in a northern Métis school, where student on-time graduation rates are low, to what extent did factors identified as affecting engagement influence student engagement?

CHAPTER 3 – STUDENTS ENGAGING IN LEARNING?

> Education is knowing where to go to find out what you need to know; and it is knowing how to use the information you get. – *William Feather*

The intent of this chapter is to present an analysis of the data gathered through student interviews and classroom observations. The data were gathered over a period of four months when I visited the community, the school, and the students. The students' words are represented through quotes and paraphrasing, which will be used to support the analysis.

Through frequent visits to the classroom I established relationships with the students and the teacher. This allowed them to feel comfortable with my regular presence in their classroom. As a participant observer, I circulated among the students and provided assistance where possible. This was helpful as it allowed the students to act naturally around me and possibly instilled a sense of comfort, and thus a willingness to participate in interviews. Initially, six students consented to participate in interviews. One of these subsequently dropped out of school and was unable to be reached on the many attempts I made to contact her, thus leaving me with five participants.

The themes that emerged from the data will be discussed separately. Supporting evidence will be given in the form of ideas coming from the students, direct quotations from the students, and observations made in the classroom. The evidence supports themes that were anticipated when the research project was developing, as well as themes that were not anticipated.

Ethics approval granted me the opportunity to interact with, observe, and interview five participants in order to uncover the extent to which they engaged in learning in Science. The case parameters are that the students lived in a small northern Saskatchewan Métis community. They were all in grade 10, either for the first time or an additional time. Their teacher chose to teach Science in a way that used inquiry and connected it to their community.

Observations

The Classroom

I found there to be, generally, three groups of students: those who attended regularly, those who attended irregularly and would exhibit disruptive behaviour, and those who attended irregularly but were non-disruptive in the classroom. In a class with 22 students registered, there was core group of around 15 regularly attending students. Among these students absences were mostly due to participation in school-sponsored sporting events that required long-distance travel. It was difficult to predict the attendance of the other two groups of students. For example, on a Friday with low temperatures (-20ºC or lower) one might predict that students with irregular attendance would stay home for the day, yet on days such as these sometimes students attended class. When the irregular attenders were in attendance, I observed them to fall into two groups – those who disrupted the welcoming atmosphere of the class and those who did not.

Amongst the regular attenders, there was a quiet calmness. The regular-attending students participated in the learning tasks, which they demonstrated by performing the tasks assigned by the teacher. They treated each other and their teacher with respect, which they demonstrated by speaking politely and in a pleasant tone of voice, and by paying attention to the teacher and to each other. The regular-attending students responded to their teacher through general conversation, school-related discussions, and by asking questions. During class instruction, the regular-attending students were attentive and they chose to sit close to the white board, smart board, and demonstration table (these teaching structures were grouped closely near the front of the room). The regular-attending students tended to sit with the same peers each day and quietly paid attention during instruction. They did speak to one another; however, it was neither disruptive nor disrespectful. I overheard side comments that were mostly task related.

These observations (pleasant, respectful, and mostly task related interactions) indicated to me that the regular attending students seemed to feel they belonged in the class. It is interesting to note that there were three students with irregular attendance, who, when they did come to class, quietly made themselves comfortable. They either participated in the learning activities or chose not to participate, yet they were not disruptive. This was particularly interesting as their sporadic attendance indicated that something was bringing them to class, but something else was affecting their attendance.

One of these two, a young female who attended school sporadically, took efforts to stand out in the community (unique hairstyle, clothing, and make-up style), and she consented to participate. However, each time I attempted to conduct an interview, I was unable to connect with her. I attempted numerous times to contact her by phone, but was unable to reach her. This left me wondering why she consented to participate yet became unavailable. I was able to observe some of her classroom behaviours. Her attendance was sporadic, and when she was in class, I never observed her to participate in the learning activities. Sometimes, her textbook would be on the table, but more often than not, the textbook stayed in her backpack. Instead of participating, she would read a novel or draw in a sketchbook (she appeared to be a skilled artist). I would often stop at her table and ask if there was anything I could help her with and she would always politely refuse my assistance. My attempts to engage her in conversation always ended in polite but brief answers that indicated to me that she did not want to converse. I respected this and kept my contact with her at a minimum. She had little contact with anyone in the class and she always chose a seat at a vacant table along the back perimeter of the class. This behaviour indicated to me that she was emotionally, intellectually, and physically withdrawing from the people and the learning. Interviewing this student would have been beneficial to this study. Why would this student choose to attend school at all? What might engage her in learning science? The other two non-disruptive, sporadic attenders consented to participate and I was able to conduct all the necessary interviews with them. The female (participant 4C) was a regular attender and agreed to participate, but then began missing more and more classes until she eventually stopped attending altogether. The male (participant 5C) had irregular attendance throughout the semester, but did see the semester through to the end (January 2010).

The other group of sporadic-attenders were the students who paid minimal attention to the teacher or the class and typically chose seats near the back of the classroom. Disruptive behaviours, when they occurred, came from these students. There were instances that their behaviour required the teacher to respond with authority and when it occurred, there was no mistaking that their behaviour was not accepted in the classroom. The teacher's response showed his intentions to maintain a positive learning environment for all students, the message being that the behaviour was disrespectful or disruptive to others or to the learning environment and was not acceptable. The response of the regular-attenders at these times was silence, disapproval (looks directed towards the disruptive students), ignoring (the behaviour or the

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teacher's response), and shared looks among each other. As there was little change among their seating arrangement over the duration of my research, I suspected that the regular-attenders preferred the front of the class to keep them in closer proximity to the teacher and the learning, and also to maintain some distance from the disruptions when the irregular-attenders were present in the classroom. With their positioning, the disruption tended to be behind them, thus being easier to ignore. Another interesting aspect of this is that perhaps their positioning was a way to block out the disrupters in such a way that it told them they did not belong.

In summary, the teacher was respectful and firm. He respected the students' intelligence and facilitated appropriate learning opportunities and most of the students responded in kind. The students tended to separate into groups – those who attended regularly and were attentive learners and those who attended sporadically and were sometimes disruptive. There was a third, smaller group of two[4] students who had irregular attendance and were quiet, non-disruptive students.

The Participants

Of the six students who consented to participate, three were irregular non-disruptive attenders. One who signed on for this study had irregular attendance and on the few days I was able to observe her, she was non-disruptive. She subsequently disappeared from the school scene and no interviews were conducted (this left me with five participants to interview). Another of the irregular non-disruptive attenders who agreed to participate began to attend less and less, and eventually left school altogether. She, however, continued her participation in the study. The third of the irregular non-disruptive attenders attended school for the entire semester. The remaining three participants attended school regularly and I perceived them all to be strong students, demonstrated through attendance and academic success.

Of the three regular attending participants, absences from class were due to school-related sport and other extra-curricular activities. Participant 1A had seven recorded absences in the first semester, all of which were due to sports (twice) and school-related excursions (four times), and one absence due to an appointment. Participant 2A had six recorded absences in the first semester, all of which were due to sports (twice) or school-related excursions (four times).

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[4] By this time, the third participant in this group who signed on had quit coming to school so I have not included her in this group.

These two participants both achieved a final mark above 85 in the science class. Participant 3B had five recorded absences in the first semester, due to school trips or illness. She did not participate in sports activities with the school. Her final mark in the Science class was 75%. Participants 1A, 2A, and 3B were not disruptive in class.

Participant 4C had irregular attendance and her marks indicated minimal success. She was absent 37 times, for unknown reasons[5]. Her final mark in Science was 11%. She was not disruptive in class.

Participant 5C had irregular attendance and his marks indicated minimal success. His absences totalled 42, of which 35 were recorded as "unknown reason[6]"; seven were due to illness. His final mark in Science was 12%. He was not disruptive in class.

At the time of writing, Participants 1A, 2A, and 3B were currently scheduled to graduate *on time* - taking three years to complete three years of high school (grades 10-12). Participant 4C has not registered at the school, even though she communicated her intent to do so at our last interview (February 2010). Participant 5C is currently registered in the school to obtain credits for grade 10 classes.

Participant Summary

Student Pseudonym - Gender	Recorded Absences (reasons)	Final Mark in Science	Interview Dates		
			I	II	III
1A - female	7 (sports and school-related, 1 appointment)	93	November 2009	December 2009	January 2010
2A - male	6 (sports and school-related)	88	November 2009	December 2009	January 2010
3B - female	5 (school-related or illness)	75	November 2009	December 2009	No interview
4C - female	37 (all unknown)	11	November 2009	December 2009	February 2010
5C - male	42 (7 illness, 35	12	November 2009	February 2010	February 2010

[5] For every absence that is not explained, the school attendance records show "Unknown reason". The reasons for participant 4C's absences became known to me once she told me about the illness in the family.
[6] See footnote above. I never came to know the reasons for his absences.

unknown)				

Even though I have included information on attendance and academic success, it is important to note here that these are not indicators of engaging in learning; however, the information does aid in profiling student engagement, which will be discussed later. The remainder of this chapter will focus on thematic development with support from observations and data gathered from interviews with the participants. I expected to find the themes that were previously developed in Chapter 1. Other factors contributing to student engagement emerged from this study.

Themes

Thematic Development

The themes to be discussed emerged from the data – interviews and observations. The interview questions were designed to probe for the four identified factors (belonging, potency, competency, and relevancy) and participant responses were analyzed in the context of those factors. Participant interviews were read multiple times and shared with my supervisor for discussion. There were many occasions where the participants spoke to the factors I anticipated; however, two other themes became apparent– motivation and responsibility.

Belonging

Classroom Observations

With belonging comes feelings of acceptance, safety, support, respect, and welcoming. A sense of belonging was expressed in many ways by the participants. We spoke about school, culture, communities, sport teams, social networks, families and peers. Observations were made in the classroom and in the school.

The teacher greeted all the students when they entered the room, and the students greeted him and their peers in return. If an irregular attender entered the room s/he was typically greeted by only the teacher and by other irregular attenders (if they were already in the room). Interestingly, regular attenders greeted other regular attenders; disruptive irregular attenders greeted other disruptive irregular attenders. Conversation and behaviour among that group was

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typically off-task and at times was obviously disruptive to the class. There was little interaction between the irregular attenders and those who attended class regularly. Regarding the students who disrupted the learning environment, I wondered what motivated their attendance and behaviour. One might suggest that these particular students did not feel they belonged and were acting out against it, perhaps out of displeasure for feeling that way. Perhaps they were interpreting messages from the regular attenders that only particular people belonged in the class and they were not a part of that group, which may have caused the irregular attenders to sense the unwelcoming message, which influenced their disruptive behaviour and irregular attendance. I also wondered why the irregular attenders continued to attend class, however infrequent it was. This and their other behaviours strongly suggested that they were unlikely to succeed. Failure to complete assignments or participate in learning activities, being absent from tests, and not showing up for the final exam were behaviours guaranteed for educational failure. I wondered if this was intentional or if the students lacked a foundation of belonging, competency, relevancy, and potency, which thus put them so far from a starting point that there was little point in attempting to be successful. Unfortunately, not one of these students agreed to participate in the study. Certainly, their perspectives would have been interesting.

Throughout the time I was with the students, I believe that the regular attenders felt they belonged in the class and the disruptive irregular attenders as well as the irregular nondisruptive attender did not have a sense of belonging. The disruptive students interrupted the environment in which the students felt comfortable but I cannot completely discern if the regular attenders' sense of belonging was damaged, although from my observations, it seemed as though the students were somewhat able to ignore the disruptive behaviour. However, when unable to ignore the behaviour, the students also sent silent messages by turning to look at those who were disruptive. As needed, the teacher responded vocally and asked the students to be more respectful of the learning environment and the students in it, or leave the classroom. Sometimes the students who were misbehaving complied by settling in, other times they left the room, and in some instances, they pushed back and spoke rudely to the teacher or outwardly defied him, which then required the teacher to take a firmer stance against the disruption. These were his efforts to maintain a respectful classroom environment that supported learning.

Disruptive behaviours tended to occur most when there was a greater number of irregular attenders in the class at the same time. Conversely, when there were few irregular attenders in

class, disruptive behaviours were not only at a minimum, but also the irregular attenders who were in attendance were more likely to participate in learning tasks. I witnessed this on a few occasions and this led me to understand that even though a student may have had poor school habits, such as low attendance and failure to complete assignments, that student would still be capable of participating in the learning and demonstrating competence, given the right circumstances. The right circumstances were likely removing the distraction and negative influences from the learning environment (i.e.: his or her chosen peer group). After observing this, I further wondered why a student would choose disruptive, negative behaviours when that student seemed capable of success. I would have been able to learn much from an interview with this type of student; however, no students that fit the category of irregular attender, disruptive behaviour consented to participate.

Participation

Student experiences indicated the presence of factors of student engagement in the participants. Participation in school related activities such as sports, music and drama, and cultural activities gave strength to belonging, competency, and potency. Being part of a sports team or part of a musical group provided the participants with encouragement and support, in successes and failures. Watching a school sport team compete in a provincial tournament, I witnessed behaviour among team members that was encouraging and supportive, through words and actions. Watching a drama group at the school perform voluntarily in front of their teachers, peers, and invited guests was another opportunity for me to witness encouraging and supportive behaviour among group members. Being a part of the team or group allows one to be the recipient and giver of words and actions of encouragement and support, which nurtures one's sense of belonging and acceptance. This is important as noted previously by Wilms (2003) in his definition of student engagement (see p. 23 of this thesis). Relationships in different capacities are an important part of belonging: peer groups, staff, parents, and leadership groups (Brendtro et al. 2002). Participation in school and sport activities, as those with the research participants, fostered those relationships.

Three of the participants were part of a sports team or were involved in other school activities. When they spoke of sport experiences as their examples of experiencing success, they were also speaking about belonging to a team, feeling they were competent enough to try out or

sign up for the team, and feeling potent, as their attendance and effort were valuable to the team. The same applied when students played music together or planned and rehearsed a stage presentation for people in their school. Acting, singing, dancing, and playing a musical instrument on a stage in front of your teachers and peers will likely induce feelings of nervousness and vulnerability; however feelings of belonging, confidence, and acceptance must also be present for the person to follow through with the activity.

Two of the participants had little participation in sport and/or drama and music activities. One of these two (participant 5C) was compelled to participate in a drama activity and was grateful to be allowed to participate in a way that he preferred. Rather than be on the stage in front of the audience, he chose to operate the lights for the performance. His unwillingness to participate on stage may speak to not feeling competent, potent, or not feeling that he belonged. He was not given the opportunity to opt out of the activity and even with his lack of willingness to participate, he still attended the performance and performed the duties he was assigned, which seemed to speak to his sense of responsibility.

The other participant (4C) who did not participate in sport activities did appear on stage in front of the audience to sing a song. Her manner of presentation was to remain somewhat hidden as she wore a bunnyhug and kept her hood up during her performance. She likely felt somewhat competent in her singing abilities, which was demonstrated by her following through with her performance. However, I suspect it was her belonging that kept her hidden, not her competency. When I spoke with her after her performance, she modestly accepted my compliments and encouragement.

School

It is not only the classroom that can contribute to the belonging one feels while in school. When asked what brings the participants to school, we spoke about the building itself, the teachers in the school, friends and socializing, and opportunities. Since the school also serves as a community meeting centre, this might also be a physical structure that connects culture and community. To determine a sense of what contributed to their sense of belonging in school, I asked the participants what brought them to school. Once participant 4C became accustomed with the school, she felt good when she was in it. "The building feels comfortable to me now

that I know it" (4C: I: 68)[7]. This feeling was similar to 1A's feelings about the school. When I asked her if there was something about the building that drew her to it, she replied: "I love this building. I have been here since it opened. I love the gym, the facility" (4C: I: 73). Statements such as these indicated that the school itself contributed to this participant's sense of belonging.

The participants were asked to consider the teachers, in terms of what brought them to school. The intent of asking it this way was to see if there was a draw from the teachers. While the teachers were respected, they seemed to have little influence in attracting the participants to school.

Interviewer: What about the teachers? Do you come to school because of the teachers?

1A (I: 77): The teachers are nice. They are just there, I guess.

4C (I: 70): I don't know them all, but I like some of them.

5C (I: 136): Not really, I just come to school on a daily basis because I have to.

One participant, 3B (I: 79) was influenced more by the teachers than the others were. Being able to understand the teachers was influential to her coming to school.

Focusing more on belonging in the science class, I initially thought that if the students felt a sense of belonging in the classroom of the research teacher, they would also feel the same about science class as this is where I observed their interactions with each other and within in their small groups. They consistently sat at the same table and with the same people (their peers); if the learning task required partners or small groups, they tended to work with their peers. The research teacher created a welcoming classroom environment.

In spite of the belonging the participants felt in their school, among their peers, and in the classroom of the research teacher, there was no evidence to show they *belonged* to science and its ideas. To *belong* to science and its ideas, I would have expected to hear them talk about deeper connections with the ideas and a clear understanding of how science is a part of their lives. Rather, their participation in learning activities was a requirement for progress in their educational goals.

Community

To expand their thoughts on belonging, I asked the students about their communities. A sense of membership and the importance of relationships were evident when speaking with the

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[7] 4C: I: 68 = participant 4C: interview 1: transcript line 68

students about their community. With one exception (participant 5C spoke about his relationship with the land), the participants defined community by the relationships with the people involved in their lives, which typically included family and friends. To participant 1A community meant: "People that care for each other, that know each other, and are there to support each other" (1A: II: 131). Her community is wide and deep: "People who I play sports with, people I have known since pre-school… [friends met] through sports or school" (1A: II: 145), as well as people she has met through an internet connection developed through a hobby. These are all people with whom she had common interests, and were mutually supportive and encouraging: "They are there for me; they cheer me on, and I do the same back; I help them" (1A: II: 157). The other participants noted similar understandings of community.

Participant 2A drew part of his definition of community from his experience in the town hosting a provincial sporting tournament. "The community means to me, the involvement of everyone…they get involved a lot" (2A: II: 122).

Participants 3B and 4C had similar thoughts regarding community. 3B said a community is like a big, big family; they care for everyone in it (3B: II: 118), and 4C said it was "families, people, friends, buildings, people working together" (4C: II: 118).

The only participant who believed a sense of community came through place rather than specific people was 5C. When asked what his community was, he responded that his town was his community and further questioning brought out that his sense of community extended locally to provincially. He also had a strong sense that Saskatchewan was his community; he spoke also about spending time living with his uncle *in the bush* and thus, he had a deep connection to the land. This was an interesting contrast to the other participants; however, I think it explains much regarding his disconnection to school. He had low attendance, but when he did attend, he sat at the back of the room, distanced from the group of regular attenders. His seat choice was also across the room from the disruptive group as well, which indicated to me that he preferred to sit alone and did not want to mix with the disruptive irregular attenders nor the regularly attending students. Another possibility was that he did not feel a sense of belonging in the class, which caused him to isolate himself from the other students. He also lacked a connection with the teachers (see 5C in the section "The School") and the school. In the first interview, he said the school was boring and that it made him want to skip classes (5C: I: 120). I found this interesting; however not difficult to believe as school did not represent his community, but the land did.

However, even with this perspective, 5C noted the value of education and support he received: "My community will help me by giving me the education I need and [it] gets me where I want to go [and I] help around; help others" (5C: II: 225, 229). With this statement, he included people as part of his community, and he understood how people in a community might help each other.

The students did not find it difficult to talk about the support offered from people in their community, and it was easy to see their sense of belonging. There was a symbiotic relationship within the community. The students identified ways in which their community supported them and how they, in turn, gave back. 3B said the people in her community consisted of family and friends: "There are a lot of people I am not related to but I consider them family anyway" (II: 140). She found her community supportive and encouraging: "They make me try things; they make me want to stand up in the community" (3B: II: 144). A reciprocated, supportive relationship with his community was also noted by 2A (II), whose community consisted of his parents, friends, and teammates. He has competed at a national level and he believed this made him a role model for his community, and in turn, his community supported his athletics through sponsorship. Furthermore, he spoke of his role as a leader in the community. When asked why he came to school, 2A replied: "Because I enjoy it. It is a good way to contact with my friends. I come here for the sports and the leadership" (I: 48). He felt that leadership was something that came naturally to him and he took pride in what he could do for others, not only with sports, but socially as well: "If someone was getting bullied, I would probably step in" (2A: I: 50). The support he received from his community and the support he gave back to his community was meaningful to him.

Other students spoke about how they were supported and nurtured by their community and thus encouraged to succeed. 4C (II: 144, 146) said "if you are feeling down or if you need help [they are] always there for you. They teach you stuff, too; take care of you when there is no one to take care of you. They are always close". To reciprocate, she gave back to her community by helping others, recycling, and by donating food and clothing to those who need it: "I like to be helpful when I can be" (II: 152). Her words were particularly interesting as it seemed she had thought about improving her community through environmental action and social justice, which was not something considered by other participants, nor was there evidence of environmental action throughout the town. This indicated to me that whatever influenced her,

in this regard, did not come from the community, unless perhaps, she noticed a lack of environmental action in her community and wanted to see change.

The statements above indicated to me that the participants had strong connections to the people and places in their lives. They felt a connection and membership to their communities, which contributed to their sense of belonging; they identified significant relationships in their lives. The science class was designed to take learning into the community. With this objective, I expected there to be a deep and meaningful connection between community and science.

Culture

Métis culture showed to be important to the participants, and the value of this was demonstrated through the cultural activities in which they participated and how they described their culture. The pride in 1A's voice was evident: "I started jigging when I was in grade two, then I went to a couple competitions with my auntie. For my first competition I got third place for Red River Jig at the Métis fall festival" (II: 167). She further noted culture is an important part of her life and that "my culture is rich in heritage; there are many people who are proud of it" (II: 186). Participant 3B had a similar feeling about culture. She spoke about making medicine with her auntie, log sawing and hauling, hunting and trapping with her uncle, jigging, and beadwork (II: 155-161). Participant 5C was also proud of his culture: "My culture is pretty good; fishing, canoeing, that is my culture; [it is] an active culture" (II: 251-253). He was learning Michif by engaging in conversation with his family members and studying Michif in school.

Most of the participants were learning Michif, by studying it in school or by speaking Michif at home with their respective families: "I just like to learn about my culture, my knowledge, and my peoples, and my Michif class" (5C: III: 341). This showed that language is an important cultural activity. There were numerous teachers in the school who spoke Michif, so there was much opportunity in the school for students to keep their language alive.

Participant 4C had what I interpreted to be a more inherent sense of culture. When asked to describe it, she struggled to find words: "native; the language I guess, a native language. My culture? I don't really pay attention to my culture. Let's see, my culture has cool dance moves" (II: 168). For someone who said she did not pay attention to her culture, she had strong memories of her week long culture camp, which she would have participated in two years prior

to the study (the grade 8 students attend a culture camp every year). At the culture camps, the activities in which the students participate are numerous: "sweats, canoeing, jigging, and they make cultural stuff like bannock on a stick; they show how to bead" (4C: II: 164). She also spoke about *cultural food* such as "moose meat, fish, rabbit, and wild animals" (4C: II: 175). It seemed to me that the participants may not study culture so much as live it.

   To make the link between culture and sense of belonging explicit, when one considers where they are comfortable, supported, safe, and welcome, a sense of belonging is likely to exist (Osterman, 2000), which leads to a greater chance of success in school (Wilms, 2003); therefore, schools that honour the culture of the students are more likely to demonstrate belonging. Additionally, the activities in which the students participate can further develop competency and potency. The participants also indicated the relevancy of the activities in terms of what connected them to people and place. It appears that cultural inclusion is a means of facilitating good learning experiences, which affects student engagement.

   The research teacher facilitated the science class to help the students connect to their community. The units of study had the students looking into their community (which is rich in culture) as they considered science concepts.

Summary

   Evidence of degrees of belonging appeared in the students' and participants' words and behaviours. Classroom observations revealed there were three distinct groups, each of which could be associated with where they might have felt they belonged. One disruptive group seemed to welcome one another, but did not seem to "belong" to the classroom learning community. One group, non-disruptive but irregular attenders, tried to participate in the learning while there. Another group attended regularly, and formed an active learning community.

   Those who gave the impression that they did not belong acted out. They may have been disruptive, which caused the regular attenders to send unwelcoming messages, or they first sensed the unwelcoming messages (perhaps due to their irregular attendance), which influenced their disruptive behaviours. It was difficult to tell if the disruptions caused messages of being unwelcome or if messages of being unwelcome caused disruptive behaviours. Without participation of irregular attenders who were disruptive in the research study, I was unable to study this further.

The behaviour of two participants indicated that perhaps they did not feel the same sense of belonging the regular attenders had. These two participants were not disruptive to the class, nor did they socialize in any groups in the school or classroom. There was little to no participation in school events, or when it did happen, they acted either behind the scenes or made the effort to remain somewhat hidden from the school community. With their lack of sense of belonging, they may have had a stronger sense of responsibility (to manage the stage lighting) or a stronger sense of competency (to sing solo in front of the school community).

Community belonging was spoken about and was indicated by behaviour. The participants spoke of many and diverse communities to which they felt they belonged and they spoke about how it felt to belong to a particular community. This involved caring and nurturing behaviours, support and encouragement, a 'there for you' feeling. Feelings of belonging extended into their culture, which was spoken about with pride. Participation was regular and diverse among the participants (beading, jigging, language, outdoor activity). Belonging to science and its ideas was not evident among the participants; belonging was not an influential factor for student engagement in learning science.

Potency

As I examined the participant transcripts, three themes appeared which seemed to address the factor, potency: accomplishment, value, and having choice.

Accomplishment

Potency is the value or worth that someone has about themselves, their learning, and their contributions to their communities and the world. This includes challenges, successes, and opportunities to share their knowledge and skills. To establish a baseline understanding of experiencing success, the participants were asked to describe a time when they participated in an activity that left them feeling they had accomplished a goal. The responses ranged from challenging sporting events, such as winning difficult games, to successfully understanding difficult academic concepts, such as math and chemistry. The commonalities between the experiences were that the initial task was challenging and a goal had been set to overcome the challenge. Participants experienced success and enjoyed the experience, as noted from interview excerpts below:

1A (I: 10): It was very challenging and rewarding at the end. [Regarding a difficult sport tournament]

2A (I: 4): We were the youngest team; we only practice in the summer. We tied for fifth out of 22 teams. [Regarding a national level sport competition]

3B (I: 4): I learned some of it, but not most of it. I can understand it. It is kind of fun. [Learning chemistry]

Participant 4C found enjoyment and challenge with math and learning new things (I: 4-10). Her sense of accomplishment came from learning how to do something and noticing that it got easier. When participating in a team sport, participant 5C said he "learned lots; it made me better" (I: 6).

These responses indicated that the participants have experienced success and accomplishment, and they have experienced enjoyment in a challenging task. The participants were also asked to explain how they knew they had learned something. Participant 1A noted: "When I learn something? It's the first time it comes to my head or I thought about it. I could teach it to other people" (I:14). For participant 2A, the indication was internal: "When I don't know the topic I am learning about then when I get the hang of it, it just pops in my mind is when I know about it and learn it" (I: 6). Similarly, 3B said she knew she had learned something when she had it memorized (I: 20); both 4C (I: 14) and 5C (I: 12) thought learning had occurred when they could perform a task without assistance from someone else. Their replies indicated that they had all experienced learning, and at the time of the interview they were aware that they had learned something, even if this was not obvious when it happened.

Value

These experiences, knowing that they could learn something, gave them a sense of potency, because their success at learning gave some value to the tasks in which they were succeeding. Experiencing success, overcoming challenges, and learning can create feelings of potency that can transfer to other tasks as well. A connected community is one that respects and supports community members and celebrates all successes (Brendtro et al., 2002). When the students spoke with pride about accomplishing the challenges set before them, they had put value on their accomplishments, which is key to potency. Having this in a community allows students

to commit to learning, look forward to learning, and appreciate the challenges that come with it. They empower themselves, feel able, and thus are willing to take on and enjoy other challenges.

Potency can be empowering and there is evidence that one might have a sense of pride; 4C was proud of her learning potential: "What I like about learning is being able to do things I have never been able to do, like anything, like piano, violin" (II: 245).

Another consideration was that their work was for the greater good. The knowledge they gained or could gain had the potential to benefit other people, either in their close communities, or perhaps on a more global scale.

> Interviewer: So you get the sense that you can be empowered, make change in some way?
>
> 4C (III: 346-348): Like if I learned something can I make a difference for something else? You can make a difference in society. You get smarter; maybe create something to help people.

The other participants indicated that the information they learned needed to be shared. 2A stated: "I now know that eating too much junk food can slow my progress for being a top athlete. [I shared this] with our high school team" (I: 85-87).

3B shared information with her community by sharing it with her family and her friends "and they share it with their family members. Basically it keeps going like a train" (I: 105).

Participant 1A, who conducted research about nutrition for athletes, felt that her findings were important because of the many athletes she knew. She stated, "I shared it with a couple of my friends, like the chocolate milk part, and about the pasta two hours before a game" (1A: I: 107). The information is spread in casual conversation among friends who "could share the information as well…[it spreads] like a big rumour" (1A: I: 125, 127). This indicated that not only were the students applying their knowledge to aspects of their lives, they were also sharing this information with others whom they deemed it would benefit. The students were not asked to share what they learned. Sharing the information was a choice they made on their own. This also demonstrated that they had enough confidence to do this and that they felt the information was worthy to pass along, which could thus contribute to their sense of potency.

I found that another element that fits sharing information with potency was their willingness to talk about school with family, friends, and people in their community. I connected conversation about school to potency as it seemed the discussion was regarding something of value.

Interviewer: Do you talk about what you are learning in science with your family and
            friends?

4C (II: 199): Just to my parents and to my siblings.

Interviewer: What do you say?

4C (II: 201-207): "This is what I learned today." Then I will explain it because I get it
            sometimes. I will talk to them about it just to tell them I don't know how to do it.

Interviewer: When you talk about it because you get it, what makes you want to talk
            about it?

4C (II: 211): I am proud of it.

The pride she talks about here indicated to me that she has had valuable learning experiences and she shares this with her family. Even at times when she had trouble understanding, it seemed that it was still worth talking about – to have her family share in her successes and struggles.

Participant 5C talked with his parent because he wanted to tell her what he was doing in school and he talked with his friend about science if the topic was one of mutual interest. They would often find television programs on the topic to learn more about the given topic. Technology was one of the topics they found interesting.

Talking about their learning indicated to me that their learning was of some value to them. The conversations involved a sharing of their day with a family member or finding a common interest with a peer. The fact that they were having these conversations autonomously led me to understand that they were exercising their choice of which topics to speak about.

Having Choice

Having choice and exercising choice is another factor that may not only be indicative of potency, but may also be a contributor to potency. Having choice within their learning experiences was investigated through the interviews. Students having choice in their learning experiences provided them with opportunities to engage in learning about topics that were interesting to them. Designed accordingly by the teacher to meet curricular requirements, the students actively contributed to their own education, which led to increased relevancy and potency. By making choices, the students could take on responsibility for their learning, thus allowing potency to develop within them. The teacher may contribute to this by creating

opportunities for engaging learning and the success that follows and by supporting and guiding the students; the teacher can further contribute to students attaining feelings of potency.

Having choice regarding a learning task was appreciated by the participants. 2A said that writing would be more enjoyable if he could choose the topic (I: 61-63). Another participant was hesitant to participate in a drama class in the manner expected of him, so when 5C was given the choice about how he would participate, he chose a behind-the-scenes role. This allowed him to participate the way he wanted and kept him active in the class. Another participant, when faced with a task that she was less than willing to complete, when given choice within the task, she was more willing to do it if she chose an aspect of the task that she wanted to learn (4C: I: 16-18). This indicated that having choice likely makes an unwanted task more appealing. The participants also noted particular subjects to study if given choice about their learning. Some of these were related to long term goals (chemistry, astronomy, physical education) and personal interest (music, Michif).

If one lacked a sense of potency, or perhaps had not experienced having choice in their education, there may be a lack of confidence when given the opportunity to choose. This was the case with 5C. The teacher did give them choice of what to study within the unit - they could choose the health topic they wanted. When asked about having this choice, 5C replied:

> You can't really call them choices, but like demands…if I had a choice, I would
> probably fail, so it is good that he demands… I might have made the wrong
> choice at the wrong time or I might have slipped away from the assignment. (I:
> 46-52)

My interpretation of 5C's use of *demands* is that the students had some limitations in their topic selection. They were required to research within the parameters of health and nutrition. This was intentional since the teacher planned to guide their research into a more scientific analysis or breakdown of nutrients. Setting the limits to their topic selection was preferred by 5C as he had low confidence in himself and obviously appreciated the teacher's guidance. This did not seem to decrease the challenge of the learning task.

> Interviewer: Do you find that having the teacher make the decisions keeps you…
>
> 5C (I: 54): Keeps me motivated to do the work.
>
> 5C (I: 74-78): [The research] is easier if I pick my own…If he gave me a topic I didn't
>   understand then I would learn more about it and it is a challenge.

Interviewer (I: 84): What if it is not as interesting though?

5C (I: 86): I would still do it because it will still be challenging.

This participant's words indicated that, for him, potency does not necessarily spread throughout all aspects of learning. A sense of accomplishment in learning may increase confidence and all participants have indicated that they have accomplished something in their lives. However, if one frequently, in school, meets with little success, this may contribute to one not feeling potent or competent. Even though 5C had experienced success and enjoyed learning, he did not always demonstrate the confidence of one who feels he has potency.

How does his lack of confidence affect other aspects of school life? The attendance of participant 5C in the first semester was low and he did not successfully complete math and science that semester. This made me curious about his willingness to attend school, which he claimed was his responsibility. In the last interview, I asked about his responsibilities for his education:

5C (III): My responsibilities? Just keep going to school, keep listening…do my work.

Interviewer: Is it your responsibility to find ways to stay interested or is it the teacher's responsibility to find ways to keep you interested?

5C: Oh yeah, it is mine.

While he appreciated the teacher for presenting interesting learning opportunities, if at any time he was bored with what he was learning, he saw it as his responsibility to become interested. Even though he saw it as his responsibility, he did not do it.

Summary

The participants had all experienced success in either a learning activity at school or something else of personal interest. For each of them, this was a time when they would have felt accomplishment and value. Accomplishment and value lead to feelings of potency, which when applied to learning tasks or assignments, is further increased if given a choice in what it is they participate. Having choice of a study topic allowed the grade 10 students to investigate something that was important to them. Their choice of topics provided some insight to what was valuable to them (sport nutrition or disease management and prevention through nutrition) and in turn, their findings were communicated to the people in their respective communities. This allowed them to see their contributions as valuable, which influenced their sense of potency.

The behaviours that indicated potency were choosing to share relevant information with people in their appropriate communities (family, teammates) and simply talking about it because there was pride in accomplishment.

If one lacks a sense of potency, s/he could lack the desire or motivation to participate in learning activities or other activities that help contribute to feelings of value. In addition, potency may be affected by not feeling belonging with the group. The participant who appeared to lack potency and a sense of belonging maintained some semblance of participation by acknowledging his responsibility to do so. Potency, although present among the participants did not seem to influence their engagement with learning.

Competency

The factor competency can be addressed under three categories. There was much to take from classroom experiences, the participants feeling competent, and addressing competency through science and skills.

Classroom Experiences

In the classroom, competency was demonstrated by successful completion of assignments and learning tasks. At times, some of the students finished their work quickly after an explanation and demonstration by the research teacher; other students worked slower and were successful; some students blatantly chose to not work on any learning tasks. When students struggled with the assignment, they accepted help, consulted with peers, or struggled on their own. These actions indicated they had strategies by which they could progress through learning tasks if the learning was difficult.

As I circulated through the room, I offered assistance if I perceived a student to be 'stuck'. Quite often, my offer of assistance was turned down or accepted at a minimum (I would give as little help as possible and leave the student to continue on his/her own). At first I thought the students might not have been comfortable accepting my assistance; however, they behaved the same with the research teacher. He circulated the room less often than I did; however, it was clear that he was available and willing to help, so it seemed to be left up to the students to seek assistance as required. This appeared to me that he respected their independence and their competency and the students appeared to appreciate this as they did not consistently require or

seek his attention. When we spoke about this behaviour in the classroom, participant 4C seemed satisfied with her actions (III: 298–307):

> 4C: I think he wants us to get things done on our own without him always telling
>
> us.
>
> Interviewer: Do you think he was trying to help you become more independent as
>
> a student?
>
> 4C: Yes. Sometimes he would say try to get your work done by this day. He
>
> was always saying you can stay after school and I'll help you.
>
> Interviewer: So you did have the impression that he cared about his students?
>
> 4C: Yes.

For competency to develop, success does not always have to be immediate. When asked about a school accomplishment (learning chemistry), 3B (I: 4) replied: "I don't think I accomplished it but I will soon." She had met with some success with chemistry, but not entirely. She had already told me that chemistry was her favourite subject, so I perceived her competency in this subject to be of great value to her even though she had not yet accomplished what she wanted.

Feeling Competent

Competency comes from knowing that one is able to perform a given task; potency is that the given task is valuable, in some way, to the person and is connected to something meaningful. An example of that task could be the performance of a skill-set required to play a sport, while knowing that performing that task contributes to success for oneself and/or the team, which also makes the task meaningful. One might also believe that performing the particular, meaningful task can influence others in a positive way. If this was the case, one could feel competent as a leader among his teammates and in his community, as seen with 2A (I), who said that he is a leader in his school. This could also feed feelings of potency due to the pride or value he would feel by being a leader on his team and in his community.

Another example may be one where a student can perform a particular academic skill, such as conducting research. Being able to successfully complete the skill can be meaningful, and the reason for conducting the research could be valuable to the student because it is connected to his/her life. By gaining knowledge, one has accomplished a skill, but if one shares

the knowledge with someone who may benefit from it, then there is additional meaning. Thus the one conducting the research can be confident in his/her skill and his/her purpose. This was seen with all the participants who shared their research findings with people who were important to them, such as teammates, family, and friends.

Additional evidence of competence was seen with the students' involvement in sports and community activities, many of which were hosted in the school. The school supports sport activities such as volleyball, basketball, hockey, canoeing, and cross-country skiing. Students who have participated in sports have competed at the local, provincial, and even national level. The community hosts, in the school, functions such as music concerts, Christmas concerts, and community suppers. During my time in the community, I saw many students, teachers, and community members come together to ensure a successful event. This indicated belonging as those involved knew they had the support they needed to participate in sports and community activities. This was not the case with 4C:

> Interviewer: Do you feel you have a lot of confidence in yourself as a student?
>
> 4C (III: 332, 334): Not really, no. I am always thinking I am going to fail; I don't feel I could pass or do it.
>
> Interviewer: What would change that for you?
>
> 4C (III: 336): Being able to go to school every single day, always having someone to help me if I need help.

Immediately prior to this part of the interview, we were speaking about her engaging in learning. She noted that she was genuinely engaged in "really hard math – it makes me feel smart. If I get to learn something people don't even know yet, it would be awesome to show them up" (III: 330).

This was an interesting comment as she seemed to have some competency in her math skills but little in herself, as she wanted others to notice her abilities. The need to have her care for young siblings and an ailing elderly family member took her away from school. Her attendance was low and the reasons for her absences were not phoned in to the school. With opportunities to attend school regularly, I wonder if she would eventually develop competency.

Science and Skills

As previously noted, competency and potency are closely related to each other, and they work together to give *confidence*. The differing point is that potency is value-added, whereas competency is the ability to perform, regardless of the value of the task or activity. The participants' comments (noted at the beginning of the previous section, *Potency)* about experiencing success and knowing when they learned something are considered here also as they indicated success, which in turn indicated to the participant that they had the ability to perform a task. With these words, they told me they felt competency in their sport or the subject of study, yet competency was not something that transferred to all aspects of learning. Thinking specifically of the research assignment in science, which was a guided inquiry, I anticipated the students to talk about developing competency in research skills. However, when asked about research skills they had the opportunity to further develop or begin developing, the participants struggled. In each of the separate interviews, I asked the students about skill development (Interviewer: "What skills have you developed in science that you will be able to use later in life?") and found their answers were mostly content related:

> 1A (I: 95): I learned what kind of foods to eat.
>
> 2A (I: 93): [I could] learn about the job I am researching about.
>
> 3B (I: 97): Nutrition; it could help me with sports and when I plan on being a
> mother.
>
> 4C (I: 86): Learning about cells and experiments.
>
> 5C (I: 152): Nothing, I guess.

With three of the participants, I attempted to focus their thoughts on specific skills, and those specific to this learning activity were research skills:

Interviewer: Where there any research skills you developed? Asking questions?

1A (I: 99): If you have one basic question, you could have a whole bunch of other little
questions.

Interviewer: Were there any research skills you developed? Asking questions?

5C: (I: 158): I don't know

Interviewer: What about [developing] skills such as writing reports?

2A (I: 99): Not right now.

From the participants' perspective, this research assignment was successful only for the broad content knowledge the participants acquired. The assignment started by the class viewing a variety of health and nutrition media sources. The teacher then led them through a guided inquiry. He asked them to write the top ten questions that came to mind, and he helped them focus their questions and connect related questions until they all came up with one specific research question – a question of their own interest. Once they all had a single question, they developed a web map of questions pertaining to their one research question. His intent was to have them first determine their topic of interest, then focus their research, and finally consider different aspects of their research question that would help them answer it more fully.

The content they found through research was important as it was intended to lead to a focused study of the science of food, regardless of the individual research topic. However the research skills developed from this assignment were also important, yet most of the participants viewed content knowledge as acquired skills, and when further questioned, they were unable to connect the ability to perform research as an acquired skill.

Feelings of competence, while not connected with learning tasks, were evident in other areas of their lives. When the participants spoke about their repeated participation in cultural activities such as jigging, beading, hunting, and playing musical instruments one got the impression that they were competent in these skills. Also, participant 1A said that other students approached her for help because her marks were high (I: 18). This indicated to me that she knew she was competent, which was reflected by her marks and her ability to help others.

It is important to note here that the teacher was not satisfied with this particular learning task, the guided inquiry. It became so time consuming that he had to cut the assignment short in order to leave sufficient time to cover the rest of the curriculum content (which he was unable to fully accomplish by the end of the semester). For the remaining units, he used a more structured teaching approach than the guided inquiry. It is also important to note here grade 10 is a significant grade in this community as it is the grade where students are lost (by dropping out) and the grade at which they return (in the following year or two, but they do not always stay to complete grade 10 or continue to complete grade 12).. The research teacher had noticed this trend and believed that by connecting learning to community, the grade 10 students would engage in learning so as to not drop out, or if returning, would engage and want to stay. By

doing something to draw in and/or hold onto the students made him a good teacher with whom to work.

Summary

Connecting *Competency* to the section *Potency*, the students identified times when they had successfully performed a task. To fit with potency, they knew the value of the task, and to fit competency, they also indicated their competence in performance, as indicated by their success. Yet, feelings of competence did not develop through assigned tasks in science. There was evidence of the participants feeling competent when they considered previous successes that required skilled participation, most of which were sport or leadership related. The exception was participant 1A, who perceived her high marks and requests from friends for help as indication that she was competent. There seemed to be little evidence about competency in performing school-related tasks. However, through the *content* that came out of the participants' research, they had the confidence to share their knowledge with their peers, even though it was content and not skill related. Low competency was apparent in one participant who understood that her inability to attend school regularly influenced her learning and confidence in negative ways. In Science, the participants' understanding of learning was specific to content and not related to skill; skill-competency did not equate with learning. In those terms, competency seemed to have little influence on engaging with learning.

<div align="center">*Relevancy*</div>

Science

Relevancy is meaningful learning opportunities. It is learning that makes sense or can be applied to some aspect of the students' lives. This requires connections between the students, the content, and the world in which they live. These connections do not necessarily happen on their own, so when teachers present meaningful learning opportunities, students will likely have a greater chance to make those connections. The goals of the research teacher were to cover grade 10 science content in a way that would allow the students to connect science to their interests, their communities, their lives. Nonetheless, the students did not connect what they were learning in science in school with their out-of-school lives. Since science is a way to understand the

natural world, I anticipated that the participants would connect science learning to their out-of-school lives.

Classroom Observations

By the time of the first interview, the students were more than two months into the school year. With this in mind, I believed they had already been exposed to learning opportunities in science that could be meaningful to them. This was a correct assumption as they had already started a research assignment pertaining to health and nutrition. The research teacher guided the students through an inquiry that ultimately led to each of them determining a topic for investigation. This was meaningful and relevant through the choice that was given to the students as it allowed them to investigate something of personal interest.

The research teacher did not direct the students to inquire about their community; however, the topics chosen by the participants were deeply community related. This led to my understanding that community is important to the students. With this much opportunity to connect science to life out of school, I was surprised to find that students saw little connection between classroom learning and life out of school. If the students were prompted, connections were made; however I would have perceived the connections to be considerably stronger if no prompting was required.

School, Culture, Goals

There appeared to be somewhat of a change or shift in the participants' understanding of the relevancy of science from the time of the first interview to the time of the third interview, although I did not perceive this shift to be significant. Since the interviews were spread over the second half of the first semester, there was sufficient time for the students to participate in learning activities that connected school and life out of school. There was evidence that growth occurred throughout the semester. Initially, students did not connect science to life and community; however, in subsequent interviews, statements were made that indicated the students did eventually make those connections. In the first interview, the participants were asked to connect science to their life out of school:

Interviewer: Thinking of your life outside of school, how is science connected to your

life?

1A (I: 38): I don't know.

Interviewer: Do you see, outside of school, where you are just [name] the person, not [name] the student, is there any connection to science?

1A (I: 39): Not really.

Later in the same interview, she stated that "if you are thinking about real life, life out there, it gets more interesting" (1A: I: 85). I understood this to mean that learning something by connecting it to *real life* (1A) made learning interesting; however, this did not indicate that she had made those connections. Another interesting point that came out of 1A's statement is that school is perceived to be separate from *real life*. This indicated to me that school was separate from life because *real life* can be used to it make school more interesting. Her perception of this did not change over the semester even though the third interview indicated some growth in her understanding of science connections: "The fact that it connects with outside. With science you can connect…science connects different…the way it explains everything in the world" (1A: III: 264). This statement indicated a change in her perception and understanding on how science connected school to the rest of the world. In the first interview no connection was made, yet within two months, she stated that the world can be explained through science.

Her struggle to find the right words was interesting. It may have indicated that the connections were still new and she was not yet able to articulate her understanding, or perhaps the connection had become implicit and that gave her difficulty in communicating her thoughts.

Additionally, only a few statements earlier, when thinking of her career goals, she said, "One of my plans is to be a lab technician so I am trying to get interested in science" (1A: II: 232). With this participant, it seemed as though there were thoughts about science, school, and planning for her future, but the connection between these was relatively weak. She had connected science to the world and had a science-minded career goal, yet stated that her interest in science needed to improve.

Participant 4C did not show increased connection between school science and her life out of school. In the first interview, she had already connected science to life outside school, but the connection did not appear strong:

Interviewer: How does science connect to your life outside school?

4C (I: 42): It could connect to TV, I guess, because you learn things. Animals, they have cells, plants…everything around us revolves around math and science.

Interviewer: Have you always thought that?

4C (I: 46): When you work you need math and science, too. When you go to a store, you need money, and science…could be in some jobs, they have to know chemicals; they have to know technology.

For this participant, there was no significant change over the semester. In the third interview, she recalled being asked the same question in an earlier interview, but did not indicate an increased awareness of the connection.

Interviewer: What connections do you see between science and your community? Can you give me specific examples?

4C (III: 156): The jobs, the things they do are scientific – a janitor works with chemicals, people that work in the mines.

The examples she used in the first and third interviews showed little development or growth. This was a similar experience with participant 5C, who in the first interview, made no connections at all but noted there was some value to learning science:

Interviewer: Do you recognize different aspects of science in your life?

5C (I: 92): Not really.

Interviewer: If you choose not to have a career in science, is there still a purpose for learning science?

5C (I: 102): Yeah, there probably will be. I might encounter something in the future that I learned in grade ten that I will think I am lucky I know what it is.

By the third interview, the connection between science and life out of school was still vague for 5C, although a practical approach made sense: "maybe when I fix my bike; that is part of science. If your chain is off, you have to measure it" (II: 235 - 237). Later in the same interview, his words indicated that he did not see himself as a science-minded person:

Interviewer: Give me some more examples of science connections in your community.

5C (II: 239): I don't know. I don't really see things that way. I don't know if science is weather. Is that weather?

It is important to note that this participant has spent a great amount of time with his mooshum *in the bush* where he has trapped, hauled wood, canoed, and fished. To understand his perspective, where one might be looking at relevant science in our day-to-day activities, to him, his activities were of little scientific note but were simply a way of life. He has shown to have poor scientific success in school, although by living and reading the world through interacting with the world, he has great potential for scientific success. Unfortunately, the connections had not been made.

The participants' statements indicated that even with the teacher's efforts for designing units of study and learning activities to incorporate learning into the students' communities, the participants did not make strong connections between science in school and aspects of their daily lives. The participants demonstrated cultural strength (discussed earlier), and they valued the approach used to help make the connections (having choice regarding a topic to research); however there was still something missing to tie it together.

Additionally, the science-culture connection was not strong, if it was present at all. I had anticipated differently, especially with the two participants who chose to investigate nutrition, due to the diabetes in their respective families. The connection to culture, I presumed, should have been obvious but was not. Had there been stronger connections, I may have heard comments about the prevalence of diabetes in their town or among Métis people, yet the concept of treating diabetes by being scientifically informed extended no further than their immediate families.

Another aspect of relevancy is whether or not students saw learning as important to their personal goals. In this case, science, when connected to their long term goals, became relevant. For the athletic-minded participants, nutrition requirements for performance improvement in athletes and overall healthiness were the topic of choice. Participant 4C chose to research nutrition for people with diabetes as she had many family members with diabetes and she hoped to prevent herself from developing diabetes. Thus, the opportunity to choose topics important to the individual students lent to the relevancy of the science education, even though the connections to community were not apparent to the students.

Within the context of school learning, relevancy was contrived by the research teacher by facilitating an assignment that asked the students to choose their research topic. Naturally, the students chose topics of personal interest, but the connections between these topics, their culture,

community, and knowing 'science' were minimally developed over the semester, if at all. Interest in science was restricted to achieving educational goals for future post-secondary aspirations.

Summary

   With a goal of creating relevant learning opportunities, the research teacher designed unit plans to help make explicit the connections between in-school science and out-of school life. To aid this, the students were guided in an inquiry that allowed them to investigate topics of personal interest as the research teacher led them toward the science connection. This was partially successful in that the participants found value in what they investigated and they shared it in communities relevant to them; however the overall in-school science and out-of school life connection did not happen. The research project was meant to be more than just content but the participants did not get that as development of inquiry and research skills was not recognized by the students to have been achieved, nor was the understanding that nutrition and health topics were science topics that connected to out-of school life.

   The participants had established goals for themselves, most of which were set years ago, and education was key to obtaining these goals. To achieve their goals, a high school diploma was a step in their journey, which may have made science course credits (not necessarily learning) relevant. As a factor of student engagement, this was not the type of relevancy (meaningful learning) I was looking for, even though education is relevant when it is important in achieving goals. However, this type of relevancy may be a key influence to motivation, which is something that most of the participants demonstrated.

Motivation

Definition

   "Motivation is the impulse, the will, the drive, the feeling that lies within the student" (Rinne, 1998, p. 621). Motivation was a theme that came out of the data as I found that the participants spoke about school in a way that indicated they were motivated to be successful.

School

   They were asked to consider aspects of *school*, such as the teachers, their peers, future goals, and the opportunities they were given. One of the questions I used to determine their motivation for learning was about why they attended school.

   5C (I: 112): Why do I come to school? To get an education; to get a life.

   4C (I: 64): So I can get a good job; sometimes it's about the learning.

   1A (I: 58, 60): I come to school because…I don't know…because it is important; I
      guess…learning and getting an education, to get a good job and a career.

   These statements can be interpreted to mean that the only purpose for attending school is to *get a job*, such that one can have financial stability, but not necessarily meaningful employment. If these statements referred only to acquiring employment, this may be considered sufficient motivation for attending and completing school, but lends little to authentic engagement in learning. However, if the job one was seeking was due to personal interest, as one might do with a career, that would be part of a meaningful vocation. Then the statements could represent authentic engagement. This would mean that education is more than just a step in a process; it is a means to a meaningful goal. The participants and their levels of engagement will be addressed later in this chapter.

   As previously noted, the teachers were not a significant contributor to the participants' motivation for education. Of the five, one participant was motivated by the teachers: "The way they teach, I understand them, so it makes me want to come to school more" (3B: I: 79). There seemed to be many aspects of education that were appealing to her. When asked why she came to school, she replied that she loved school and would prefer to attend even if she were ill because being at home was boring. Not only was she motivated to attend school, she was motivating to her peers as well. She considered herself a 'nerd' who always told her friends how important school was and that they should also attend as much as she was (3B: I: 71). This participant's attendance was quite high (only five absences in the semester); her attendance was a reflection of her motivation to attend school.

   The importance of school was indicated by 1A: "I come to school because it is important…learning and getting an education, to get a good job, a good career" (I: 58, 60). In the second interview, 1A spoke about being motivated to get through the boring parts. Her response indicated perseverance:

I just basically come to school for the fun of it and I do my best. I don't think about the future [but she does!]; I just go day by day. It interests me – taking music classes and other classes to contribute to the future. Science class is something I need to do (1A: II: 246).

These two participants seemed to take school seriously, but were also enjoying the experience. They both saw the value of an education and this was a key motivator in bringing them to school daily. Participant 1A's comment was particularly interesting as she first stated that she did not think about the future, yet in the same sentence, she noted that her classes contributed to her future. She was obviously aware of the long-term benefits of taking the classes she was studying, yet this was not explicit to herself.

Other people in the school whom I anticipated to be influential in bringing the participants to school were their friends. While there was somewhat of a social aspect to being in the school, when asked why they came to school, their friends appeared to have some influence, but did not appear to be a significant draw:

1A (I: 62, 65): I come to school to hang out with them; to talk, but sometimes, I don't talk. I just come to do [school] work. I think it is basically a routine for me…I get up and go to school.

2A (I: 48): [I go to school] for sports and the learning…because I enjoy it; it is a good way to contact with my friends; I come here for the sports and leadership.

4C (I: 64-66): I get to see them [her peers]…but sometimes it is about the learning.

5C (I: 118): They [his peers] are here; it doesn't matter.

Where one might consider school to be a major social centre for youth, these participants did not indicate this. Perhaps there was a sufficient level of involvement with their peers through school sports, and cultural and community activities that there was little need to accommodate the social aspect of their peer relationships while at school or in class.

Goals and Learning

There were many ways in which motivation was demonstrated by the participants. In the interviews, we talked about getting through the boring parts of school and how to stay interested when attaining career goals was at least four or more years away. The participants were asked to consider the opportunities the school offered and their responses indicated that school was an

important part of their future. They spoke about credits for graduation, sports, leadership, scholarships, and music; "There are lots of opportunities in the school" (4C: I: 74). It was apparent that school was a place of opportunity, a stepping-stone for their futures.

Looking first at their long term goals, four of the participants had been career planning for many years. Participant 3A had wanted to be a massage therapist since she was in grade seven and since that time, she kept this goal in focus, even though the goal was more than three years away (3A: II). Participant 2A was similar in that his goal to study physics had been with him since grade seven and this interest had become stronger over time (2A: II). Participant 4C frequently spoke about her goal to become a lawyer or nurse so she could help people (4C: II); participant 1A had aspirations to become a lab technician or a musician (1A: II). The career goals of these four participants all require post-secondary training, and they were aware of this. For some of the participants, science was a course of study that would enable their goals.

Staying Interested in Learning

In all types of learning, there are times when the learning can be difficult and not exciting; it can be boring and mundane. This can even be the case when taking a class of interest. To look further at their motivation, I posed to the participants a query about getting through the boring or difficult parts of learning. Sometimes a boring task can be made more interesting if the students are given choice within the task, and choice can be given in numerous ways. Some participants preferred a particular teaching method, such as using a hands-on, active, student-centred, learning approach (1A: II, 4C: II, 5C: II). As noted earlier, having a choice in a topic of study was also important to maintaining interest and motivation for school work, as was seen with the guided inquiry.

The participants noted that there were times when you could not avoid a challenging or boring task and they all had strategies to cope, whether it was a special way to maintain interest or simply to push through the less appealing part of the task by perhaps keeping a long term goal in mind, finding an intrinsic reward, or accepting it for what it was.

When participant 1A found music theory boring, she would "just stay focused on my work and get finished as fast as I can so I can get to the playing part" (III: 311). Playing music was her reward for hard work, so this motivated her to get through the theory. This was particularly interesting because her strategy for getting through boring parts in a topic not

musically related, she relied on acceptance: "I just go through with it because I know I have to use it; I have to know it in the end" (1A: I: 242). For her, the topic was what depicted the strategy. There was deeper intrinsic motivation due to personal enjoyment of the overall activity, whereas an academic subject required for education advancement held less motivation. Acceptance was a common strategy for participant 2A who did not have a specific way to stay interested although he still persevered with the learning: Participant 2A would "probably try my best to learn it" (I: 218).

I interpreted these actions or strategies to be indicators of motivation as difficult or boring parts of learning and seemingly *out-of-reach* goals can influence one to quit pursuing an education for a shorter term, more exciting endpoint (such as a regular pay cheque, for example). Motivation does not mean that learning has to be fun and students do not have to enjoy the task; however they do need to feel involved and want to do the task, no matter how challenging or difficult (Rinne, 1998). One might suspect that when a learning task is boring or difficult, it may be more compelling for students to quit the task; however, the participants found ways to persevere.

Summary

The participants were motivated to attend school mostly to fulfill long term goals, most of which required post-secondary education. The overall goal was to complete school. There were few outside influences (friends, teachers) that influenced their attendance and socializing was not a priority for going to school regularly.

There were times when the participants experienced boredom or tedium with school activities and they had their own strategies for maintaining focus or drive for completion. Some of these strategies were to be more active in the learning or to persist because of their goals. Staying motivated was something for which the participants believed they were responsible.

Responsibility

Definition

Being responsible is to have moral accountability (Merriam Webster, 2012) therefore responsibility for learning is students being accountable for their own learning or education. This may be demonstrated in many ways, such as participation in learning tasks, attending school

regularly, and putting forth maximum effort for learning. Based on the participants' comments about responsibility for learning and staying interested in the learning tasks, regardless of the challenge or tedium, responsibility was a factor that I believe contributed to student engagement.

Teacher Support

The consensus among the participants was that it was not the teacher's responsibility to make learning fun and interesting, although they could be an important influence:

3B (I: 89): I am able to understand them, what they are saying. They help just enough.

4C (I: 76): If you are troubled, they explain it better to you and they try to give you examples.

2A (I: 65): Whenever I ask for help, he usually explains the question. He is always there when you need him.

The participants appreciated having teachers available for assistance but the participants also had limits to how much assistance they wanted. They wanted only enough assistance to get them past a difficulty or a problem, which they likely struggled with for some time before they requested assistance.

On one occasion when I visited the class and was moving amongst the students while they were working, I found that if they were held up on a difficult problem, they were still hesitant to ask for help. When I offered assistance, not all students accepted the help. Some preferred to work through the problem themselves. I observed that the teacher did not move around the room much. This may have been a habit developed through knowing his students and their preference for independent learning, although he was always available to help the students upon their request; this message of availability was made clear to the students. I interpreted this as the teacher granting them independence and ownership of learning by respecting their desire to work through challenges themselves and by him offering assistance at *their* request. As it turned out, the students agreed with this approach. As well, Corno (1992) noted that teachers who help too much take away from the responsibility students may feel about their own learning. With too much help students may not feel responsible for the work that is done nor may they have pride in what was accomplished.

The students regulated the amount of assistance given by the teacher by requesting assistance when needed, and the teacher respected this. Where one might suspect that the

students are only looking for the answers (is this going to be on the test?), the participant statements indicated they wanted to understand how to get the answer: "I'd say not to give you the answer, just help us with the question" 1A (I: 93). Other participants thought the same way: "If you just ask for help and he always gives the answer that would be too much" (2A: I: 67); "What he should do is explain everything, what it means, once, and let us get to our work" (4C: II: 199).

Other responses supported this:

Interviewer: Do [the teachers] help you too much, just the right amount, or not enough?

3B (I: 93): Just the right amount.

Interviewer: What would be too much?

3B (I: 95): If they keep coming to me and asking me if I need help and I keep saying no, especially if I am on the same question, they will come to me and ask me if I am having trouble, then I say no, and they come back five minutes later, that's too much help.

This student preferred to know that help is available so she could seek it out when she felt she needed it, which tended to be the practice of the other students. This led me to think that she felt confident that she could assess her own needs and determine when she wanted help. She did not seem like a student who simply wanted the answers and she was not alone in this as other participants also said they would not benefit from unwanted help. Participant 1A also appreciated the independence she was given in the classroom "to help us [learn to] make our own choices" (I: 91).

Participant 5C explained that too much help involved the teacher giving so much information that he (5C) would become overwhelmed and the teacher missed the point of the original question. His advice was "if I ask a question, tell me how the question goes and how to solve it, and after that, I'll be set" (5C: I: 144).

It appeared that the students appreciated assistance when they needed it; they wanted just enough to get them started. This belief was consistent among the participants, with 5C preferring an explanation rather than answers and 4C's statement indicated agreement because given an answer means "you don't really learn anything" (4C: I: 82). These participants showed no impatience with difficult problems in their schoolwork. They

tended to work through problems either by themselves or with their peers, and when more help was needed, they approached their teacher.

Student – Teacher Relationship

There was an obvious relationship between the teacher and the participants and this seemed to be a relationship that worked. In the context of the teacher-student relationship, I asked the participants about the responsibilities each member of the relationship holds. With these participants, most of the responsibility for obtaining an education rested with the students.

Participant 3B identified that a mutual relationship existed between the student and the teacher regarding who was responsible for what in a learning experience. She noted that the teachers are responsible for answering questions and teaching required material and students are responsible for paying attention. She even went as far to say that the teacher and the students were accountable to each other:

> Well, the students have to listen to the teacher in order to learn what they want to learn and the teacher has to answer most of the questions that the students ask them. So the students are the boss of the teacher and the teacher is the boss of the students (3B: II: 219).

She was the only participant who expressed this depth of teacher accountability and she agreed that the students are responsible for helping teachers do their jobs well. Students being responsible for themselves was a strong message. A second participant stressed this (III: 368-375):

> Interviewer: Who is responsible for your learning?
>
> 4C: The person that is supposed to be learning.
>
> Interviewer: Is it your teacher's responsibility?
>
> 4C: Both, I guess…the teacher just a little bit…help them, guide. It is your responsibility to get up every day to go to school; to do the work, to do homework if you have to; pay attention. The teacher's…it is not really theirs. They can't make you go to school – they just have to teach you what you have to learn.
>
> Interviewer: Is it their job to make the learning or the experience better?
>
> 4C: They shouldn't have to but they could.

Interviewer: Does the teacher have to find ways to make it fun and exciting or is it 'I am going to teach and it is still your job to come here and be a student'?

4C: The second one because even though it is boring, the students should still learn it.

These participants indicated their understanding of responsibility and ownership of learning. These are not passive students as they take an active role in their education, whether by finding ways to stay interested in the learning or by assuming responsibility for participating as a student.

Corno (1992) wrote about two sociocognitive theories: "motivational processes (success expectations and orientations toward schoolwork) and volitional processes (such as assuming responsibility for learning and regulating concentration, behaviour, and affect)" (pg. 71). Overall, this is responsibility, whether it is for controlling their behaviour at the moment or for planning for future goals. There are times during school where content and learning tasks are not exciting, yet even at these times, the participants did not feel that the teacher needs to provide more entertaining learning opportunities; they still feel that it is their responsibility to engage in the not-so-exciting learning. A sense of responsibility coming from within the students was also evident in how they approached learning when the task was challenging or uninteresting. Where some students withdrew (Corno, 1992) or fell into states of rebellion and retreatism (Schlechty, 2002), those who felt responsible for their learning "focus and concentrate and become more engaged in work than usual" (Corno, 1992, pg. 70). This was evident within the students' responses that were previously noted in the section *Motivation*. I interpreted their comments to fall under both factors as they spoke about staying motivated, which was a responsibility they took onto themselves.

Interviewer: If there is something you don't like, or find boring about a topic, what do you do?

2A (II: 212): I just learn it and get along with it.

3B (II: 189): [I make] it fun and interesting…I think of myself as a teacher and I teach myself the material.

4C (II: 237, 239): I just do my work, I guess. If I don't know what to do, I ask for help. After I get things and I know what to do, I get interested. It is boring when I don't know what to do with it; I do things that will make me interested in it, like try figuring a hard question or something.

5C (II: 310): [I would] make it fun…if the teacher was talking about coins and he had a couple coins up there for his examples, and if I had a quarter in my pocket, I would make it fun and do what he is doing in his examples…so I don't lose my concentration.

These strategies supported the participants' responsibility for staying motivated to learn; however, to get a clearer picture, the participants were asked who was responsible for the learning that occurs in the class. Once again, this was something they took on themselves:

1A (II: 258): My responsibilities are to take notes in class, to pay attention during class, not to talk; need to be interested in the topic.

4C (II: 266): Make sure I do the work, try to get it in on time, and pay attention in class.

5C (III: 369): My responsibilities? I don't know; just keep going to school, keep listening"

When asked about the teacher's responsibilities, the participants granted the teachers some responsibility, but not much. The participants expected guidance, assistance, and support from them and it helped if the teachers were genuinely interested in what was being taught: [They should] "keep the topic interesting; be interested in the topic they are teaching" (1A: II: 259). Participant 4C also thought the "teacher try to make it fun for the kids" (4C: II: 268). In the science class, the teacher regularly reminded the students to complete and submit assignments, although the responsibility to do so was left up to the students. Where some teachers may pressure students to complete assignments and learning tasks, the teacher in this study did not. The students were given regular reminders and due dates were written on the board; however, the responsibility ultimately belonged to the students. The response from one participant was that this action was acceptable as it contributed to their independence and responsibility (4C: III: 298–307):

Interviewer: What about [research teacher]?

4C: He would tell you to do the work then the next day he would tell people to get it [handed] in.

Interviewer: Do you think there was a reason he was choosing to not…

4C: I think he wants us to get things done on our own without him always telling us.

Interviewer: Do you think he was trying to help you become more independent as

a student?

4C: Yes. Sometimes he would say try to get your work done by this day. He

was always saying you can stay after school and I'll help you.

Interviewer: So you did have the impression that he cared about his students?

4C: Yes.

The impression left by the teacher showed this participant the depth of his caring and trust, both of which likely contributed to the classroom culture as well as the students' sense of responsibility. These statements indicated to me that the participants respect the teachers for being there and they knew the teacher cared for them and their success, but ultimately, the participants were attending (or not attending) and taking part in their learning (or not) on their own accord, due to their own sense of responsibility.

Responsibility to Community

In the interviews, the participants identified their communities, which spanned from family and peers to sport teams and internet groups to their town and province. Their responses indicated that they gave much thought to and participated much with their respective communities. As noted previously the participants received much support and encouragement from their communities and the participants reciprocated this. With this in mind, I suspected that the participants might connect more between school and community since they seemed to invest in their communities. Choosing research topics that enabled them to provide information for people in their respective communities was the closest connection to community I noted, and that did not extend much farther than family and sport team. One of the participants spoke briefly about cleaning up the town and another spoke about wanting to have the local bar close its operation, but neither of these ideas came to much; they were more speculative than anything else. The participants spoke little about their commitments to other communities (relational, physical), which could be interpreted to mean there was little responsibility to these other communities, aside from their belonging and participation. Their behaviours indicated otherwise.

One behaviour that allowed me to infer their sense of responsibility was with the sport communities to which they belonged, specifically participants 1A and 2A. Their continued participation with the teams may indicate they were responsible to the team – their coaches and

teammates – and this led to consistent attendance at practices and games. This is further supported by their attendance record at school, which shows absences only for sport events (travelling outside their local community was often required for games against other teams).

Participant 4C displayed behaviours that indicated that she had a sense of responsibility to her family (relational) community. With an ailing family member at home, 4C's responsibility to her family was greater than her responsibility for her education. Whether or not there was additional influence from her family members, I did not know; however, she left school to provide care at home. Once that responsibility was lifted, she was then able to shift her priorities; however her impending return to school (which she spoke about and was supported) never occurred. I am unaware of her reason for this.

Extending into their long term goals, I thought perhaps the participants might have planned to complete post-secondary studies (they had mentioned post-secondary goals) and perhaps they planned to return to their local (geographical) community to build a career. This seemed reasonable to me since there were others in the community who had modeled this. None of the participants spoke specifically about returning to their town. This led me to consider that education, career, and community were not considered together in their goals.

Summary

The participants believed the responsibility for obtaining an education was theirs. The responsibilities of the teachers were limited to assistance as required (but not too much), being interested in what they were teaching, and guiding the students. The research teacher helped the students develop responsibility and independence by posting due dates but not constantly reminding the participants to submit assignments. The participants were responsible for all other aspects of their education – attending school, completing assignments, maintaining interest and focus on the learning tasks, boring or not. A sense of responsibility for other communities in their lives was evident by particular behaviours. Participation on a team and caring for family members were other significant responsibilities the participants had, and at times, outweighed their responsibility for school.

Success

Definition

If a student is deemed to be successful, the common understanding is that the student has completed school 'on-time', meaning the student has graduated between the ages of 17-19 years and has completed grades 10 – 12 in three years. Conversely, a student who has not graduated on-time did not complete high school (grades 10-12) in three years is not successful. It is worth considering other measures of success, depending on the goals one sets out to achieve.

Participant Success

Looking at the perceived success of the participants, from the perspective of broader societal values, participants 1A, 2A, and 3B would be considered to be successful. This would be based on their academic success (finishing school). Since none of the participants spoke about desiring to achieve high marks, I presume that completion was all that was required. Academically, their marks were 75 or greater, which led me to believe that there was effort on their part to perform well in school. The aspirations of these three to pursue post-secondary education would further indicate their desire to be successful. At this time, I am unaware if they have registered or been accepted into a post-secondary institute.

Pertaining to participant 5C, an extensive personal interest in one's own life and culture meant he did not completed school on-time (thus unsuccessful), yet his extensive experience and knowledge regarding his land and his peoples, could indicate that he achieved great success. Another participant (4C) left school to care for her family[8] and thus would be considered unsuccessful, but if success was to be measured in a way that acknowledged her achievement she then she was successful. These two experiences indicated that there can be more than one way to measure success. However, based on their lack of completion of grade 12 on-time, society would deem participants 4C and 5C to be unsuccessful. Their inability to obtain credits to move themselves towards completion of grade 12, even in a greater time period than three years would likely be the basis of this judgement. Had they returned to high school and completed, even if it happened in more than three years, they would still appear as a statistic, for this community, indicating a lack of educational success.

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[8] I did not learn the outcome of the family member's illness. It could have been a partial or complete recovery, or it could have been a loss of life.

It is expected that youths will complete their education; to not do so indicates a lack of success. If one were to ask the participants if, at this time, they believed they were successful, I wonder what they would say. Participants 1A, 2A, and 3B would likely say they were successful because they would be submitting to society's broader values and participants 4C and 5C would likely say they were not. If one were to consider other indicators of success, their responses might be different. If putting an education on hold to care for a family member, especially for a young student who had not yet completed high school, was an indicator of success, then participant 4C was successful in that goal. If coming to know your culture through time spent in a close relationship with an elder family member who guided you to engage with the land was an indicator of success, then participant 5C was successful. Society's broader values, for participants 4C and 5C, apply little worth to their non-school experiences but what value is held by people of their culture (and by culture, I mean people who maintain their Métis way of life and are not heavily influenced by the dominant discourse).

Engagement

Connections between school and life out of school are an important part of student engagement. One of the ways I suspected students would show their engagement with the learning was if they voluntarily talked about what they were learning, the reason being that people talk about what interests them. The individual research project was a school topic I thought would make for out-of-school conversation due to the personal choice granted for this project. I asked the students if they shared the information in their community and if they thought it was important to do so. The participants indicated that the information they found was important to share with others in their community; however, the conversations tended to happen in smaller circles, such as with teammates (1A, 2A), friends (3B, 5C), and family (1A, 3B, 4C), rather than large-scale community announcements. Participant 3B noted the importance of sharing the information but the manner in which this would happen was through more face-to-face conversation: "I share it with my friends and they share it with their family members. Basically, it keeps going like a train" (3B: I: 105). 1A also relied on a chain of casual conversation where information spreads from person to person "just like a big rumour" (I: 127).

These statements indicated that the students were engaging in the learning, which was demonstrated by their initiative to connect the learning to their community by sharing the

information with them. Even though the communication was in small circles, they believed the information would spread.

In order to ask the participants specifically about the level of engagement in their learning, it was important to have a clear and concise resource available. The five levels of engagement described by Schlechty (2002) served that purpose. Students may exist anywhere among these levels for an entire course, a specific unit of study, or from one class or day to the next. What influenced the students to move between levels could have been school-related or otherwise, perhaps such as events occurring in their personal lives.

I shared with the participants a one-page summary of Schlechty's (2002) levels of engagement (*authentic engagement*: learning is valuable and meaningful, students are intrinsically motivated; *ritual engagement*: students are engaged but the goal for learning is driven by extrinsic motivation, perhaps by a mark; *passive compliance*: students participate to avoid negative consequences; *retreatism:* there is no engagement, students do not participate but they also do not misbehave or disrupt the learning environment; and *rebellion*: students refuse to participate and tend to cause disruption in the class or substitute unrelated activities) and asked them to consider where they existed as a student and for different subjects they were studying or had studied. With little hesitation, the students identified where they sat at different levels of engagement. The one-page document showed the same definitions mentioned previously (refer to Chapter 1).

The students were asked to identify where they existed in the given levels, pertaining to different classes in which they have participated. It was important to allow them to consider the classes individually as personal interest or preference may have influenced their level of engagement. It was also important to note that the level of engagement could change within one class from one day to the next, depending on factors such as a particular topic of study within the class, the teaching method of choice for that day, or personal circumstances at that time. The students had little difficulty in determining their location on the engagement continuum:

Different experiences with different teachers led to 4C placing herself at different levels of engagement (4C: III: 28-291):

Interviewer: We have talked about engagement [levels]. Where do you put yourself in terms of engagement?

4C: Probably that one where they do the work so they don't get in trouble…if I don't do my work... [Specific teacher] would get mad because I didn't do my work sometimes.

The teacher in this statement was not the research teacher, whom she explained was a teacher who instilled independence and responsibility in the students (see page 83/84). Speaking with 4C about her experiences with the research teacher, she appreciated the independence he inspired, although this did little to contribute to her success (4C: III: 308-319):

Interviewer: Were you getting your work done in math and science?

4C: Not really.

Interviewer: What was preventing you from getting it done?

4C: Boredom, not being in school, falling behind, and not knowing what is happening in the class. It was confusing.

Interviewer: Were any [classes] authentic engagement?

4C: I liked music class, singing and playing piano – I like playing instruments; PAA [Practical and Applied Arts] – building things; I wanted to go for Michif – I like learning new languages.

Interviewer: Are you interested in Michif because it is available or because it is a cultural language?

4C: Pretty much both; and I like Phys. Ed – the running around.

Interviewer: If you had to sit in a desk and learn from reading a book, how would you feel about that?

4C: I would still do it even though I don't like sitting in one spot for a lot.

Interviewer: Why would you still do it?

4C: Because I have to.

This participant had a difficult time with her education during the year of the research study. A family member was ill and 4C was required to stay home and help with the young children and the ill family member. This influenced her attendance, so when she was able to attend, there was no continuity in her learning, no flow from one day to the next. This caused confusion, which may have led her to move from a higher level of engagement to a lower level of engagement.

In November 2011, I confirmed that she, since our last interview, she had not registered at the school. Had she been able to continue and be successful, she would have graduated in June 2012.

Participant 5C identified varying levels of engagement, mostly determined by his personal interests, likes, dislikes, and the involvement in the class:

5C (III: 335): I like the work, and [for] ritual engagement, I have to work to get the marks for this assignment, then I am usually back to authentic [engagement].

5C (III: 339-345): I really like welding class; I like Native Studies – that is authentic. The teacher makes it fun…she makes the whole class participate.

When asked about a math class, his low sense of competency was apparent: "I like it; I am kind of slow at learning it. [It is] authentic but I catch on slower than others" (5C: III: 349). I found this interesting that his level of engagement was not based on success. This indicated that even at times where one feels low competency, s/he may still be authentically engaged in the learning.

A short time later, we discussed how he could move from a lower level of engagement to a higher in a class such as math, and again his competency was noted: "I am not sure, if I was smarter, I guess" (5C: III: 367). This same student claimed personal responsibility for educational goals. He never blamed anyone for his attendance, lack of success, or for making school interesting (although he did note that engagement was high in one class due to the teaching method employed by the teacher to make the class highly interactive). This is also the same student who used coins in his pockets to emulate the example being demonstrated by the teacher. This participant indicated that challenges in school were not necessarily negative influences to authentic engagement.

This was also the case with participant 2A:

Interviewer: Overall, with the sciences, are you authentically engaged?

2A (III: 276): Yeah.

Interviewer: When you find the topics really challenging or you are having trouble understanding, do you still feel the same?

2A (III: 278): Yeah, I just want to learn it; it's interesting.

In an earlier interview, this participant expressed authentic engagement by taking the initiative to look up topics of interest outside of school. His academic interests were science-

related: astronomy, weather, and natural disasters (tornadoes and hurricanes). I asked him if this was something the teacher presented in class or if he investigated these topics on his own, to which he replied: "I look those up on my own" (2A: II: 177). It was learning on his own initiative that indicated his authentic engagement in learning topics of personal interest.

Participation level seemed to be a common influence in raising student engagement. Authentic engagement occurred for 2A in classes such as Physical Education where "you can do circuit training" (III: 274). Moving from ritual engagement to authentic required "more interesting things, like class activities, instead of just doing the straight work [like textbook work]" (2A: III: 280). This was similar to the response by 1A who said "it depends on what classes, I guess. It depends on the topic, too. If it's a boring topic, I [am] the second one [ritual engagement]" (1A: III: 275). 1A was the only participant who identified herself to fall into the category of *rebellion* and when this occurred, it was due to boredom[9]:

1A (III: 287, 289): When I am bored; whenever the teacher is not really giving us instructions.

We just sit there, sit around, chat, write notes, go on our cell phones; I tell random jokes.

For classes that she did not find interesting, she identified herself to be ritually engaged, knowing that the work she was doing would help her get the credits she needed. Moving from one level to the next required an increase in activity: "when it is hands on learning instead of writing notes and reading textbooks. But most of the time, it is not hands-on. Then it's ritual" (1A: III: 327). The nutrition unit was one in which she was authentically engaged due to the teaching method employed: "it was fun learning different stuff, like researching and having our own topics…We got more open choice, more choices instead of sticking to one thing" (1A: III: 335). It was after this unit of study that the teacher reverted back to a more structured teaching method due to the time that the research projects were taking. At that point, science became a ritual engagement for 1A, until the weather unit, in which she was, at times, authentically engaged: "We did go outside. It was fun learning about the different patterns of clouds; it was

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[9] Boredom came at times when she was waiting for instruction from a teacher. This would have been a time when the research teacher had regular and irregular attenders in the class and was required to either have the regular attenders wait while the irregular attenders got 'caught up' with the learning tasks, thus having the regular attenders wait with nothing to do. The other option was to get the regular attenders on task and have the irregular attenders wait for instruction. The challenge here was leaving either group idle. It was unfair to have the regular attenders wait since they had diligently attended class and used their time wisely. It was also risky to have the irregular attenders wait as they could have easily become disruptive and it was, as I perceived, important to get them somewhat engaged in a learning task as the task may have been something that would bring them back the next day. This was too often a challenge for the research teacher.

interesting" (1A: III: 351). For participant 1A, getting out of the classroom and outside made for authentically engaging learning. In these cases, the move to an authentic level was due to the lesson that teacher planned for that day; however, 1A thought that moving from one level of engagement to a higher level was within her control, as she could be "more focused and try to get more interested instead of just sitting there" (1A: III: 364).

Considering different classes, there was some variation in the selection that each participant stated would put them at a specific level of engagement. This was expected as individual interest would be an influential factor of student engagement. Preference for a particular class or classroom activity contributed to student engagement, with *active*, student-centred learning being the strongest contributor for authentic engagement.

There was also an understanding that ritual engagement may be the appropriate level of engagement if the class was not one of interest, but was required for future goals. 1A (III: 242) noted: "I just go through it because I know I have to use it; I have to know it in the end." 4C identified math as a course for ritual engagement for her: "Because you have to get the work done because you have to get your Math 10 to move on, to pass the school year."

None of the participants identified themselves to exist at the retreatism level of engagement, except for 1A who admitted she was occasionally rebellious (see previous page).

Moving from one level of engagement to a higher level is possible and the students have identified that it is their responsibility to move, although there are some ways that the teacher can help this by using "more hands on stuff instead of a big text book" (1A). For herself, 1A said she could be "more focused and try to get more interested instead of just sitting there" (1A).

Participant 3B was unable to participate in the third interview where the discussion focused specifically around student engagement. This left me without her comments; however, in a previous interview when she spoke about cultural activities, it was clear that she was authentically engaged (in cultural learning):

> 3B (II: 169-173)): It is really interesting to learn; stuff that other people would not know how to do, but if they learned [it] they would be really good at it. The most interesting is the beadwork, sewing, making, dreamcatchers; I always watch people make moccasins. It takes time; you have to have patience. If you practice really hard, you will [learn] patience.

Participant 3B said that her interests in school were chemistry-related topics; however, aside from chemistry, was ritually engaged in learning. Her words about the levels of engagement, in the third interview would have added to this section.

Chapter Summary

The participants in this study seemed to be mostly ritually engaged in school, which means that there were times of authentic and ritual engagement, yet little meaning and little connection between in-school and out-of-school life was evident.   I found that the participants' engagement with the learning varied according to subject, area, topic, and method of instruction. For each participant, a specific topic would hold their engagement between ritual and authentic and they could move between these depending on the teaching method used. Most of the engagement occurred at the ritual level of engagement; student-centred tasks tended to be authentically engaging. Even at times when the learning was not interesting, the participants took the responsibility to maintain an interest in the task at hand, and they developed and used their own strategies to accomplish this.   Completing school and pursuing long-term goals were the main reasons for attending school.

CHAPTER 4 – ENGAGING STUDENTS IN LEARNING

The beautiful thing about learning is that no one can take it away from you.
- B.B. King

Being an Engaged Learner?

In a classroom in a northern Métis school, where student on-time graduation rates are low, to what extent did factors identified as affecting engagement influence student engagement? Student engagement is about being and behaving as a learner and can be revealed in different ways - attendance, academic achievement, participation in class, classroom observations, participant statements and perspectives on engagement. Schelchty (2002) categorized five levels of engagement, in which students can exist anywhere at a given time, and they can move between levels, depending what is influencing them at a given time. The PISA report identified a *sense of belonging* as the psychological component of students' engagement and also a behavioural component that had attendance and participation in school activities as indicators of engagement (Wilms, 2003). The PISA report did not consider levels of engagement. In this study, three of the five participants had high attendance and participated in school activities, yet their levels of engagement were less than authentic, to use Schlechty's (2002) levels of engagement. Additionally, the two participants with low attendance and behaviour that distanced them from the school community, indicated times of authentic engagement, depending on the topic of study or the manner in which it was taught.

Four factors that influence student engagement, identified by SPSD (2009) are relevancy, competency, potency, and belonging – what they called the four *dimensions of student engagement.* These paint only part of the picture of student engagement; as noted, there were other factors uncovered through participant responses to questions about community, culture, teacher support, responsibility, autonomy, belonging, and participating in challenging activities. Two other factors identified in this research were motivation and responsibility.

Belonging, Competency, Potency, and Relevancy

Watching the participants in the activities such as those described in Chapter 3, it was apparent that three of the participants felt they belonged and they were accepted, as was indicated by their behaviour. Team and group membership and voluntary participation, combined with the welcoming atmosphere provided by their teachers, within their classroom, and within their community provided the nourishment needed to fulfill their sense of belonging in the school. This meets the requirements for belonging, as defined by Wilms (2003), Brendtro, et al., (2002), and Osterman (2000). The other two participants seemed to have little to no sense of belonging within those groups, although they did have a sense of belonging elsewhere; 5C felt he belonged to the land and 4C seemed to have a strong sense of belonging within her closer family 'community'.

Also within these experiences, competency was evident as membership required a judgement or appraisal to be made by the participants and of the participants. Continued membership indicated not only belonging, but also feeling competent and confident in one's ability to perform adequately enough to hold membership. Combined with Schunk's self-efficacy (1991), which consists of the appraisal of one's capabilities, competency is involved in this membership experience, which was demonstrated by the research participants.

Membership also allowed the participants to feel that team or group members valued their actions and participation. Cheers, high-fives, collaboration, smiles, and hugs showed support and encouragement. This would have nurtured the participants' potency, as noted earlier by Sagor (1996) and Dodd (1995) where potency is having feelings of value and worth, or feelings that one's contributions are valuable and will make a difference. Each member must have felt he or she was valued and what he or she brought to the team or group was an important contribution.

By having their choice of a research topic in the subject area classroom, the participants chose to study something meaningful to them, which was evident in the topic choice (for each, their respective topics impacted their lives in some way) and the fact that they shared it with their family and friends. There was little indication that the participants talked about school with their peers; however their research results was something they shared. This is what indicated to me that their topic of choice was meaningful to each of the participants and this was a prime opportunity for science to be explicitly relevant. There was value and meaning to what they

learned, which was evident by first, them choosing something that was important for others in their respective communities, and second, choosing to share what they learned with those communities. Choosing and sharing elicited potency and the participants could see their contributions as valuable. The participants who were active in sports shared their learning with their teammates, the participant who left school to care for her family chose and shared about diabetes and nutrition, and the participant who had a small peer group at school (his girlfriend) chose and shared about nutrition to maintain a healthy lifestyle. Sagor (1996) included relationships in his definition of belonging and Brendtro et al. (2002) noted that relationships with peers were important to one's sense of belonging, yet the participants said they did not go to school for their friends. Participation as a team or group member may have supplied the relationships required to fulfill those needs. In the interviews, the participants indicated other relationships, pertaining mostly to family and friends, which seemed to be nurturing and fulfilling. Relationships with these people seemed to be important to the participants, yet when speaking about community, school, science and other topics of study, the participants did not talk about how what they learned was valuable to them or their communities. They identified long-term goals and noted that school was an important part of achieving their goals, but they seemed to see little else of value in their learning. Even with experiences that gave them competency and by studying topics of personal interest, relevancy, potency, competency, and belonging were not influential to their engagement with learning.

How does this fit into academics, especially since the participants noted that their attendance at school was mostly due to their long-term goals rather than for seeking or maintaining relationships that nurtured belonging, competency, and potency? The relationships the participants had with people in the school tended to be positive, which likely led to a more positive school experience; however, the successful students would have likely been successful in the presence of neutrally influential relationships. Most of the participants attended school because it would move them closer to their career goals. The participants said they came to school for the learning and their friends did not influence their attendance, (nonetheless, one of the participants encouraged her friends to attend school). This meant that attending school was to complete their education and obtain credits required for graduation and post-secondary education.

Most of the participants seemed to have a sense of belonging, specifically referring to the participants who were able to meet conditions that supported belonging, competency and potency through participation in school related activities. In the school, all of the participants demonstrated a respectful relationship with their teachers, and as noted earlier, this respect was reciprocated. There was a professional relationship between the teacher and the students, whereby the participants expected that the teachers would do their jobs. This made for a positive experience, although it did not seem that the teacher-student relationship was a key component to engaging with learning.

Being a team member, whether on a sport team or within an artistic group, likely instilled belonging, competency, and potency in a way that was perhaps not only required, but was also inherent. Where literature has shown that belonging is an important factor for student engagement, this may have been something the participants did not realize was a part of the learning experience. Perhaps their sense of belonging in their school community was so well nurtured through their own participation in activities of choice they were not conscious of those feelings.

Looking at the two participants (4C and 5C) who did not hold membership in school groups (these two also tended to sit alone at their tables during science), they still maintained a mutually respectful relationship with their teachers and their peers, although, there was less interaction among those two participants and their peers and teachers. During the research period, the male participant (5C) had a girlfriend whom I often saw with him. Based on my observations, they tended to have little interaction with others in the school. I also noted that the female participant (4C) had little interaction with others in the school, yet, there seemed to be a strong family connection with her, as evident in our last interview, which took place in her home and in the company of her parents. As with the male participant (5C), my lack of observations may have also been due to these participants' poor attendance, and thus a decreased opportunity for me to observe them in peer interactions. Also with these two participants, there may have been influences greater than personal motivation, long-term goals, and a sense of responsibility to keep them from maintaining engagement with in-school learning. The unknown influence(s), if they existed, were strong enough to keep these two participants from regularly attending school, regardless of 4C's career goals and 5C's identification of his level of engagement and responsibility for his own learning.

Responsibility, Motivation and Levels of Engagement

The participants' sense of responsibility was strong throughout the study. They took learning onto themselves and were accountable to themselves when the learning was less interesting or outright boring. Even with the two participants who were not academically successful, they did not attempt to blame others for their lack of academic success. Their sense of responsibility is further evident in their commitment to attend school[10].

The participants stated weaknesses or barriers to their success and these were noted in a manner that suggested a mature understanding of their individual situations, along with a commitment to long-term goals to be successful. Three of the five participants had successful school experiences, including an on-time graduation this year; to this day, the other two will not graduate "on-time". For participant 4C, there was a long-term goal and an understanding that completing high school was important for her career; nevertheless, she left school for a family responsibility that was a priority. It would be unfair to say that she behaved irresponsibly by leaving school to provide necessary care for family members. This indicated she was responsible, but to a community other than school.

The participants assigned little to no responsibility to the teachers, other than doing their jobs; they did not expect the teachers to be responsible for student successes (or failures). The participants believed they were responsible for getting to school each day, completing and submitting assignments, paying attention and following instruction, and maintaining an interest in the learning. Once I shared with them Schlechty's levels of engagement (2002), they did not talk about being engaged in learning as a responsibility, but rather their conversation was about being interested in the topic. I interpreted that their interest could have been either authentic or ritual engagement.

Motivation to complete school was a significant influence for the participants. All of the participants had long-term goals, for which completing high school was required and they seemed to keep their goal in sight. With the three successful participants, there was a maturity about their approach to education - they persevered through the more challenging parts of school and took pleasure in other parts (i.e., sports, music). It seemed to not matter to them if they were less than authentically engaged in learning; they were going to finish school, regardless.

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[10] Participants 4C and 5C made a verbal commitment to complete school; however, they did not follow through on it.

Of the three successful participants, I first equated their academic success with the highest level of engagement - authentic. However, this was not the case: these participants maintained their success even when they identified that they were not authentically engaged in the learning; they were content with performing for the reward – the course credit. Can students be expected to be authentically engaged in everything the curriculum asks of them? When discussing the levels of engagement with the participants, the times of authentic engagement occurred in classes in which the content or learning tasks fulfilled personal interests. If the content was of particular interest or the teaching method was appealing, the participants identified that they were authentically engaged. Otherwise, they tended to be ritually engaged, which I perceived to be, for them, a sufficient level of engagement to fulfill their long term goals.

What is required for consistently having authentically engaging learning and is it important to always have authentically engaged students? If students maintain a ritual level of engagement, which is still engagement, is that acceptable? Of the lenses through which Vibert and Shields (2003) discussed student engagement, the lens I perceived to apply the most among these participants is the interpretive/student-centred, which contains student autonomy and responsibility in a situation where the students are viewed as capable. Observing the teaching and planning of the research teacher, I believe he saw the students, at the least, through the interpretive/student-centred lens as he gave them autonomy, expected and supported their responsibility, and it was easy to see that he found them capable. Ideally, he may have been proud to see his students as critical/transformative or even interpretive, however, if a these learning perspectives are considerably new to students, and not consistent within their school experiences, it is likely difficult to bring about this evolution.

The participants had definite career goals. They held responsibility for learning and other commitments and were motivated to complete school. The research teacher facilitated student-centred learning opportunities, yet the successful participants noted times of authentic and ritual engagement, or even rebellion. The unsuccessful participants had classes in which they engaged in the learning, but that was not enough to either keep them attending school regularly or return to school when daily family care was no longer required.

Students Engaging in Learning

It is expected that students will complete the twelve years of school provided for them, and completion involves obtaining the curricular credits determined by the provincial government, which is also responsible for the curriculum. As the current provincial curricula stands, when not given the choice to study topics of personal interest, or at times when school learning and out-of-school connections are not made explicit, students are left having to study Western curriculum (in-school learning) as something separate from their out-of-school lives. In our society, over the last 200 or more years, Aboriginal peoples have been marginalized and their histories not represented. The current curriculum does not explicitly represent the world in a different way and thus we are left with the dominant discourse as interpreted by teachers, who if not diligent in fulfilling the requirement for inclusion of Aboriginal content neglect to give it the required attention. Students in the research community did not make connections between school and out-of-school concepts[11]. The teachers in the community and the school itself address local culture, through an annual culture camp and offering Michif language class and Native Studies. As well, some of the teachers will mention Aboriginal history, perspectives, and content. Nonetheless, in a world dominated by Western world views (especially from the media), students could be left believing their history, culture, and language are not relevant to school.

Even though teachers are expected to interpret the curriculum to best suit the needs of the students, like all other Saskatchewan schools, teachers and school administrators must adhere to the provincial curriculum and are allowed some variation to meet the needs of the students. However, this study shows that the needs of the students were not being met as they found it difficult to authentically engage in the content they were learning. Even with the diligence of the research teacher providing meaningful learning opportunities, the participants still did not connect out-of-school life to in-school learning. Participant 5C's personal interest lay purely in cultural studies and he was fulfilling the provincial requirements at a slow rate, and with minimal success. His preferred means of learning occurred through cultural experiences such as "living in the bush" (5C). My interpretation of this comment is what he found important to learn was not a part of the curriculum that he was compelled to learn. For him meaning could not be found in the provincial curriculum but in the lifestyle of his grandfather and his culture. Cultural

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[11] Demonstrated also by collateral research

learning was meaningful to him; provincial curriculum was not. He had little success in math and science, and he pursued these subjects as a means to acquire credit for graduation. School was important to him only to satisfy what was expected of him, according to the dominant discourse. Postsecondary school was not one of his goals, but he did believe he should get his grade 12. Participant 4C thought the same about societal expectations. She was expected (and supported) to return to school to, at the very least, complete school. For the remaining, successful students, there were times of authentic and ritual engagement; long-term goals were prime motivators for completing school. Their goals were intrinsically motivating and the course credits, extrinsic; levels of engagement varied according to factors not identified in this research.

As determined by the prerequisites for acceptance into post-secondary institutes, the students have little choice in what they study. It is the efforts of passionate teachers that create opportunities for students to participate in meaningful, relevant learning. Haberman (1991) called this *good teaching,* which facilitates active learning. When connections between out-of-school life and in-school learning are not obvious, the teacher may help this along, which is what the research teacher did in this study.

The research teacher planned for connections between school learning and community. This would have suited *relevancy*; however, in interviews, students did not 'see' the connection between school learning and community. When given choice regarding what to study, the participants chose topics relevant to the community groups; however, the overall learning was not connected to their bigger communities nor did they see the *science* in their chosen topics. This indicated to me that students saw that out-of-school lives, and school learning were not connected as learning activities specifically designed to make these connections were minimally successful. The statements made by the participants were too broad in terms of science learning in school and their out-of-school lives to indicate a solid connection.

Looking at Shernoff's (2002) definition of relevancy, relevant learning is education for acquiring goals, which the participants in this study have identified as the motivation for school. The participants' long-term goals were instrumental in helping them pursue classes to obtain credits, as well as to help them persist through the boring parts of learning. This did not make the content relevant, but it did make the action of learning, or participating in the learning tasks relevant to the students as credit for the class was needed for advancement. The level of

engagement I perceived at this point was ritual engagement (Schlechty, 2002) as the students were engaging in learning for the purpose of completing a task simply for the reward at the end.

There were definitely times when the learning was relevant, such as with participant 1A who authentically engaged in learning music, although her interest in music was personal and not related to career goals. Ideally, she would have liked to pursue a music career (her career aspirations were more academically related; musical success would be a bonus). Even with her depth of interest in the topic, she persisted through the boring parts to get to the playing. Music was a topic in which she authentically engaged; learning music connected to her in personal ways.

Should in-school learning connect to students in personal ways? Through guided inquiry (interpretive/student-centred) the participants chose topics of personal interest and they willingly shared the information they learned, yet to what extent did the information actually impact their lives (critical/transformative)? Did the athletes make changes in their diets to reflect what they learned? Were dietary changes made to improve the nutrition for the diabetics in the family? When the participants spoke about their findings, they all said they shared the information, but they never said they started to practice it. I suspected that the participants were ritually engaged, yet it was still meaningful (had they talked about making changes in their lives, based on their findings, I would have suspected the learning to be more meaningful or authentically engaging). I perceived guided inquiry to be a new experience for the students, especially since the research teacher chose guided inquiry as a *new* approach for his students[12]. It is unfortunate that this method did not work for him as he was reluctant to use guided inquiry again. Perhaps greater overall success would have occurred had guided inquiry not been a new experience for the grade 10 students. If guided inquiry was used earlier and more frequently in the participants' school careers, the results may have been different.

Student engagement is an interesting concept but in practice, there are so many different ways of playing with it and many factors that influence it. A student may persevere through boring parts (i.e., music scales) in order to achieve a high level of performance with the instrument. A student may do the math to earn the credit to get to the post-secondary program that will help him or her achieve a rewarding career. These are instances of ritual engagement,

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[12] He may have done this before, in another school; however, it seemed to be new and innovative for this Métis school.

and these students seemed satisfied with that level of engagement because they were motivated to achieve. With all the participants who readily identified less than authentically engaging learning, is that acceptable since they kept their sights on the bigger picture of their career goals? Attending school diligently did not indicate authentic engagement – but it did responsibility and motivation. Can one have ritual engagement but for authentic purposes?

Through their statements that supported concepts associated with engagement, the students demonstrated an understanding of what it means to be engaged in learning and they identified their own personal levels of engagement. They assumed responsibility for their learning while acknowledging and respecting teachers. Some participants had a strong sense of belonging within the school and classroom communities; others did not. Yet, all the participants spoke about a community or communities of which they were a part. When challenged to come up with a research topic, the participants chose something that would be important to their community; however they did not indicate this to be an impactful assignment. There was some meaning to the learning task, yet it was not strong enough to help the participants make clear the connections between out-of-school lives and in-school learning (science). The provincial curriculum requires inclusion of Aboriginal content, yet this tends to come up short. Even in a Métis school, the dominant discourse prevails and the goal for completing school is to come one step closer to attaining a job. With this long-term goal as a significant motivator for obtaining an education, the students exhibit a strong responsibility for their own education. Regardless of the efforts of a diligent and dedicated teacher (or a less diligent, undedicated teacher), participants 1A, 2A, and 3B would succeed in school, even without consistent and authentic engagement with their education. This seems to make engagement with learning a moot point. Participants 4C and 5C struggled with success in school, and to date, the struggle continues[13]. Nevertheless, for all these participants, the door between out-of-school lives and in-school learning seemed impervious.

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[13] Participant 5C registered to complete grade 10 credits in the 2011-2012 school year.

Why is student engagement important?

Looking Back

"Student engagement refers to whether students feel they belong at school, accept the broader societal values associated with schooling and participate in school activities" (Wilms, 2001, p. 52). This quote suggests that engagement with learning is sufficient if students are willing to become educated to suit the values of society, but it fails to define or recognize the origin of societal values. If a white-dominant society is setting the values, with neglect for differing Aboriginal values, there is great potential for failure for Aboriginal students. If the education system fails to include Aboriginal values, in the societal set of values, the students are ill-prepared to succeed in the dominant society. Living in the dominant discourse has been the norm for Métis (and other Aboriginal) people for many years. Métis culture consists of blended influences, "from each cultural group (Cree, Saulteaux, French, Scottish, English and others) the Métis selected what pleased and suited them best and so evolved their own unique culture" (Racette, 1985a, p. 7). Métis people were heavily involved in the fur trade and Métis children were valuable resources, having accessibility to the cultures of both parents. Relationships between the Métis and settlers were amicable and lucrative until tensions arose between the Northwest Company (NWC) and Hudson Bay Company (HBC) trading companies; relationships dissolved. Government proclamations prohibiting free trade to others outside the Selkirk Settlement restricted the entrepreneurship of the Métis people (Douaud, 1983). The purchase of territories and unfair land allotments made by the Canadian government further increased hostility. Feeling that their land, culture, language, way of life, and economic prosperity were at risk, Métis people were in despair. With the Confederation of 1867, the northwest was still without a governing body (Racette, 1985b), which led to the Métis forming a provisional government in 1869 (Racette, 1985a). Métis communities were formed in Alberta, Saskatchewan, and Manitoba, with St. Laurent being the first Métis community formed in northern Saskatchewan in 1871.

In a society that disenfranchised them, the Métis people experienced economic hardship, due to decreased buffalo populations, loss of laws that supported their way of life, and loss of employment sufficient to support their people (Racette, 1985b). The outcome of military resistance and Riel's death led to many more hardships. They were "at the mercy of the changes

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which were sweeping the Canadian West…they struggled to survive and to find a place for themselves in the rapidly changing society" (Racette, 1985c, p. 23). The Métis people dispersed, which led to small, isolated communities in Saskatchewan, Alberta, Manitoba, and the United States (Douaud, 1983). Without treaty acknowledgement, the Métis could not retain their identity in the same way that First Nations people did. "The ordinary Métis had none of this – they were definitely outside the general path of progress, yet they were not marginal enough to be put aside under special status" (Douaud, 1983, p. 75). With Métis in the middle, cultural incompatibility existed on both sides. Neither the white people nor the First Nations understood the culture of Métis people; "they partake of both Indian and white cultures, but are not fully accepted by either" (Douaud, 1983, p. 77). Lack of acceptance and identity, and numerous racial experiences, such as those told by Maria Campbell (1973), even led some Métis people to denounce their culture. Living as a Métis child at home and trying to fit in in a white school and society that failed to recognize or value other cultures created external and internal conflict for Métis people that has lasted for many years.

Douaud (1983) identified four types of Métis, ranging from traditional to modern. Some completely integrated into the dominant (white) society; some lived on the fringe of white society (disconnected, such as the road-allowance people); some lived on the fringe of Indian reserves (also disconnected); and others in small isolated communities where Métis culture and traditions were maintained. This last group is the one that best upheld traditional Métis culture, and seems to best describe the community area of this research study. The issue with having an isolated cultural community is that the boundaries between geographical as well as cultural communities are wide and deep. The benefits of having a distant, isolated geographical location are a separation from the dominant discourse. However, once a highway and media (television, radio, internet) enter a distant community, the dominant influence is difficult to ignore.

Interactions with other (dominant) cultures is a challenge due to a lack of a fair understanding and acceptance of minority cultures, combined with the fragility of someone who has left his/her Métis community to participate in another community consisting of the dominant culture. This potentially sets up the postsecondary student for additional challenges by first being away from his/her community and support and second moving into another community where his/her role and identity are lost in the dominant culture. The question then becomes, what has to happen so that Métis people (and all Aboriginal people) can leave their home

communities and interact and exist in another community that is not primarily of their culture? Or if the community is shared, such as in larger city centres, how can Aboriginal and non-Aboriginal people harmoniously coexist?

Looking Ahead

Poverty, poor health, lack of education, and substandard living conditions are still common among Aboriginal peoples. Canadian statistics predict a rapid population growth of Aboriginal people in Canada (of which Métis people make up 33%), many of whom will be of age to enter the workforce (Preston, 2008). Completion of secondary and ultimately postsecondary education leads to the "spiritual, emotional, physical, and academic wellbeing of Aboriginal peoples" (Preston, 2008, p.1). Preston's research into postsecondary education for Aboriginal peoples stated that it is critical that there be much invested in improving the employment potential of Aboriginal peoples. Employment potential stems from higher education, and higher education is key to "supporting, promoting, and sustaining the overall health and security of Aboriginal peoples and their culture" (Preston, 2008, p.5). The benefits are many as the "economic vitality and social wellbeing of Saskatchewan…are dependent upon the educational success of Aboriginal peoples and their entry into the workforce" (Preston, 2008, p. 4). If we are to rely on the participation of Aboriginal peoples to ensure the vitality of our society, why would we expect them to attempt to succeed in a society that overlooks who they are? Furthermore, if participation in society requires adequate education, why would we expect them to be successful in an education system that neglects to provide them with what is necessary to guarantee their success? The western dominant discourse is the structure of the provincial curriculum and it fails to meet the needs of Aboriginal peoples.

A Critical Pedagogy of Place

Adopting ideas from Freire (*Pedagogy of the Oppressed),* Gruenewald (2003) stated that *place* is essential to challenging the dominant discourse, which begins in one's community. *Critical pedagogy* "challenges assumptions, practices, and outcomes taken for granted in the dominant culture and in conventional education" (Greunewald, 2003, p. 3). Gruenewald (2003) looked at and merged these two concepts to give rise to the idea of *critical pedagogy of place*. While at first seemingly opposing concepts (critical pedagogy as an urban and social context;

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place-based education typically as ecological and rural), combining the two concepts presents an educational praxis that can challenge the dominant discourse by endorsing an education that helps students first focus their learning and explorations on themselves and their community. That exploration can then be expanded to farther, more distant communities in their world (Gruenewald, 2003). These concepts work well together because critical pedagogy decolonizes and place-based education creates reinhabitation, where first decolonization recognizes that disruption and injury has occurred and reinhabitation teaches to live "socially and ecologically" (Gruenewald, 2003, p. 9). A critical pedagogy of place challenges the status quo, decolonizes, and makes a student population aware of the places they inhabit. This is the approach that participant 4C of this research study was (subconsciously?) taking. His experiences of living on the land with his mooshum allowed him to read and understand his world, but he was not able to connect that to the *word* he could have read in the classroom. Perhaps time and attention specific to his learning progression would have made a difference and the classroom learning would have been more meaningful, and engaging.

The learning must be meaningful and must be near to the students, such as in their communities. In the context of critical pedagogy of place, Gruenewald (2003) stated that the value of content and skills is not lost and students are still prepared for participation in the global economy because the educational experience gained "aims beyond preparing students for market competition" (Gruenewald, 2003, p. 7). Standardized *placeless* curricula (Gruenewald, 2003) can provide adequate learning; however, a critical pedagogy of place will be enlightening and transformative due to pedagogy that challenges the dominant discourse and uses teaching that is "grounded in what students are familiar with; actualities rather than abstractions" (Lewthwaite, 2007, p. 5). The concept of critical pedagogy, while considered an alternative form of education has been used before.

Maori schools in New Zealand challenged the dominant system to reclaim their language and culture (Lewthwaite, 2007). The five principles guiding this is comprised of self-determination and autonomy, validating and legitimating cultural aspirations, incorporating cultural pedagogy, mediation outside of school that put school as a priority, and community support structures (Lewthwaite, 2007). This "transformative praxis" (Lewthwaite, 2007, p. 3) was applied to a Canadian school in the Northwest Territories that had a 97% Aboriginal student population; the administration and teachers were non-Aboriginal and from the southern part of

Canada. The school is under provincial jurisdiction, is led by a regional school board, and is thus much like the school in this research study. The provincial curriculum sets the school up for disconnections between learning and culture. A transformational initiative, a critical pedagogy of place, "culture-based education" (Lewthwaite, 2007, p. 4) was used to enlighten and embrace the culture of the community. A culturally preferred pedagogy requires cultural-based and place-based learning, such as teaching and learning by using the appropriate language, taking the classroom (and thus the students) onto the land, and deeply incorporating cultural knowledge into curricular programs. These reflect the principles of the Maori schools that aspired to provide "teaching and learning settings and practices…to effectively connect with the life experiences and cultural backgrounds of the community" (Lewthwaite, 2007, p. 13). This initiative reflected the aspirations of the research teacher for this study as he provided opportunities to do the same. In other classes (electives) he taught, the research teacher organized canoe trips and cultural activities (such as lessons in rabbit snaring) to take the students into their cultural world. To make the provincial curriculum community-based, he focused study into the students' local, cultural community.

My suggestion is that student engagement within a critical pedagogy of place should happen early in their school career so with each school year, students experience meaningful learning that touches many or all aspects of their lives. The inability to connect in-school learning with out-of-school living (as measured by the impervious door between in-school and out-of-school lives) experienced by the students was likely due to the many years of school immersed in dominant curriculum. The most significant success experienced by the Maori schools was seen in two schools that began a transformational education early in the lives of the students. One school was a pre-school and the other was an elementary school, both of which had high achievement levels and experienced a revitalization of culture (Lewthwaite, 2007). If this were the case for the participants in this research study, their school experiences could have been better. Three of the five participants focused on the broader societal values (get educated, get a good job). The research teacher believes in inquiry and pedagogy of place, yet grade 10 may be too late to start. If the students had experienced school as a critical pedagogy of place early in their lives, cultural experiences (such as those seen with participants 4C and 5C) would have greater value. The students likely would have still endeavoured to meet the broader societal values, but may have entered that journey with a solid understanding of their culture and identity,

and understood explicitly how in-school learning connected to out-of-school living. This would have made for an enriched school experience. The other two participants experienced failure because they were unable to reconcile how societal values fit their culture. They were unable to sacrifice their cultural values to suit the expectations of society. If the students had experienced school as a critical pedagogy of place early in their lives, they might have understood that they need not sacrifice their culture to set and achieve goals that connected to broader societal values. This could have been a successful and enriching school experience for them. Considering that Aboriginal culture is ubiquitous in Saskatchewan, all students should be part of a transformative education so that dominant discourse would become truly inclusive. This could be an enriching school experience where the door between school learning and out-of-school living is always open.

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APPENDICES

Appendix A – Research Timeline

September 2009

- Meet research teacher and school administration
- Meet grade 10 students
- Began making general observations

October 2009

- Ethics approval granted
- Invited students to participate
- Continued making observations

November 2009

- First round of interviews
- Continued making observations

December 2009

- Second round of interviews
- Continued making observations

January 2010

- Third round of interviews

February 2010

- Third round of interviews completed
- Participants reviewed and released transcripts

Appendix B – Interview Questions

INTERVIEW I

- Describe an activity that you have participated in where you were challenged, you enjoyed it, and you felt a sense of accomplishment.

- How do you know when you have learned something?

- Was there anything in science that comes to mind? How do you know that you've learned about those?

- There are things that you have to do, regardless of whether you want to. How does choice affect your willingness to give the task your all?

- If you were given a choice, what would you prefer?

- What would you prefer to show you 'know' something?

- What kinds of choices would you like to see offered to you in science?

- What would you like to do to learn material in a way that suits you?

- In what ways, outside of school, does science affect your life?

- Do you see any purpose for learning about science, if not for a career?

- What can scientists do to make your world better?

- What fields would you like to see "advanced science"?

- Why do you come to school? Is it about your peers, the building, the teachers?

- What opportunities are for you in this school?

- What are your favourite classes?

- In what ways does your teacher assist your learning?

- How much guidance is good and what is too much?

- With the first unit you did in science, how did you feel about coming up with your own research questions?

- Had you made connections between food and nutrition and sports before? Have you made any significant changes in your life compared to what you know now?

- Do you share this information with people? Family?

- What skills have you developed in science that you will be able to use later in your life?

- How is what you are learning in science important to people in your town? In your family?

- Would people benefit from learning about nutrition?

- Is there anything you have done to help people in the community learn about this?

- Is it important to share this information with them? What could you do?

INTERVIEW II

- What is a community to you?

- What types of communities do you participate in or feel comfortable in?

- Do you see these as a different community or as a sport community

- Are there other communities that you see yourself as a part of?

- Who is a part of your community?

- In what ways does your community help you?

- How do you give back to your community?

- What connections do you see between science and your community?

- What kinds of cultural activities do you do?

- How would you describe your culture?

- Would you say you are genuinely interested in what you are learning about science?

- What makes science interesting?

- Is there anything in science that you find boring?

- If you could learn science however you wanted, you would say, "I would love to…"

- Do you talk about what you are learning science with your family and friends? Are you talking about it because you find it interesting?

- Would you say you are interested in science?

- How does your interest in science influence the decisions you make about your future?

- What do you do when you are learning about something interesting and there is a boring part in it, what do you do to stay interested? If you are learning something about music, but there is a part that is boring, how do you get through that boring part?

- Success us an important motivator for finishing school but the rewards/success are a long way away. What keeps you interested now?

- Do you think about your future, what steps you need to take for a career?

- Do you connect this is to where you want to be in the future and how does school fit into your path to get that point?

- What are your responsibilities for your learning and what are your teachers' responsibilities for your learning?

- What do you do when you are not interested?

- What do you find the most interesting about science?

- What can the teacher do to keep it interesting?

- If the teacher doesn't like the topic, should he hide the fact that he doesn't like it?

INTERVIEW III

- I am going to show you this chart…It starts from the bottom and goes up to show levels of engagement. The top one is authentic engagement. If I was authentically engaged in something; I am completely focused on it; I am completely interested in it; I love being there; I am happy being in this learning environment, I am paying attention and I want to know more and I am excited about what I am learning. Then there is ritual engagement where I am engaged in the learning but I am doing it for a particular reason – I need to get a ninety in the class so I am going to pay attention because I need that mark. Then there is passive compliance, where I am not really interested in being here but if I don't do the work the teacher will get angry with me, so I will do the work so the teacher won't get angry with me. You comply to avoid negative consequences. Then there is retreatism: I don't want to be here, I am not interested in learning. Let's say you are in math class, but you don't want to be in math class, so you bring out your ELA book and start reading. You are there but you are not paying attention. The last one is rebellion and this is where is someone doesn't want to be there, I have to be there, I don't want to pay attention; I am going to talk to my partner; I will play with the taps, I will make a paper airplane. Do you understand how those five levels work?

- Where do you see yourself as a student?

- Can you give me examples of topic that would fall under [a specific category] for you?

- Authentic engagement - when do you see yourself in that level of engagement

- Is it when it is the topic that is interesting or something about the topic is made interesting?

- Do you ever see yourself in the stage of passive compliance? Retreatism? Rebellion?
- These questions applied to many subjects. By doing this, the students could think about what each class meant to them. It was not expected that they would feel the same about every class.
- Elements of engagement were also asked, depending on the response of the student.
    - Ex: What is it about ELA that is authentically engaging for you?
- Some questions were asked to clarify
    - Ex: So then if it is hard and would you say you are at _____ stage of engagement?
    - Ex: What is it about music that is authentically engaging for you?
    - Ex: So when music theory is boring, how do you get through it?
- Some questions were asked when the student indicated different levels of engagement between classes
    - Ex: So for the first three we talked about they were authentic, and this one is ritual. What is different about it for you?
- Do you think it is possible to move from one level to the next?
- What would have to happen for you to be authentically engaged?
- If something about how the content was taught, that could change it for you?
- How about the topics in science…are you engaging in those?
- Which do you find the most interesting and engaging?
- Are there ways you are responsible for moving yourself from ritual to authentically engaged?
- How is it your responsibility to move from being ritually to authentically engaged?
- When you try to get more interested in something you don't find interesting, what could change that? Is it something outside of you or within you to get more interested?
- Is the teacher in any way responsible for helping you move from ritual engagement to authentic engagement?
- Is there anything in your community that could help you?

365. Interviewer: Do they make learning fun?

366. 4C: Some of them, yeah. Some are by the book, some make activities. I used to think that I would be a teacher so I would be nicer to the students and make it easier and more fun to learn so people would be more interested in learning.

367. Interviewer: I get the impression that you have a positive outlook for being successful.

368. Interviewer: Who is responsible for your learning?

369. 4C: The person who is supposed to be learning.

370. Interviewer: Is it your teacher's responsibility?

371. 4C: Both, I guess…the teacher just a little bit…help them, guide. It is your responsibility to get up every day to go to school; to do the work, to do homework if you have to; pay attention. The teachers'…it is not really theirs. They can't make you go to school – they just have to teach you what you have to learn.

372. Interviewer: Is it their job to make the learning or the experience better?

373. 4C: They shouldn't have to but they could.

374. Interviewer: Does the teacher have to find ways to make it fun and exciting or is it: I am going to teach and it is still your job to come here and be a student.

375. 4C: The second one because even though it is boring, the students should still learn it.