

**ENGAGEMENT IN ADULT FIRST NATIONS LEARNERS:
THE POWER OF ACADEMIC SELF-CONCEPT**

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Abstract

Academic self-concept has been shown to significantly affect student engagement and achievement (Hudley, Daoud, Polanco, Wright-Castro, & Hershberg, 2003; Akey, 2006). This action research project explores specific strategies that are effective in increasing 24 adult First Nations learners' academic self-concept, engagement, and achievement in Science classes over a period of five weeks. Student participants came from three college courses: General Science, Biology and Chemistry. In addition to numerous existing strategies to increase student perception of academic performance currently in use in my classroom, this study explores action research implementation of the following new practices to further augment students' academic self-concept including: students' daily journal of new learning, direct teaching of students to attribute success to ability and effort (and failure to lack of effort), visual display of lesson objectives, linking new work to prior experience explicitly, and increasing expectations of assignment completion. There are recommendations for teachers and students to increase positive academic self-concept and more effective teaching strategies to enhance student success and completion, as well as meaningful experiences in education.

Table of Contents

Abstract.....	iii
Table of Contents.....	iv
Introduction.....	1
Background.....	2
Review of the Literature.....	3
Implications for Engagement and Achievement.....	3
First Nation Learners.....	9
Promising Instructional Practices.....	11
Characteristics of Adult Learners.....	14
Action Research.....	15
Method.....	18
Data Collection.....	27
Results.....	28
Measures of Academic Self-Concept and Student Engagement.....	29
Measures of Achievement.....	40
Personal and Professional Reflections.....	41
Discussion.....	46
References.....	49
Appendices.....	54
A: Science Motivation Questionnaire.....	55
B: Weekly Student Journal Entries.....	59
C: Teacher Journal Entries.....	61

D: Pretest and Posttest Marks.....	62
E: Sub-Survey Scores from Second Survey.....	63
F: Sub-Survey Scores from Fourth Survey.....	64
G: Attendance Data.....	65
H: Assignment Completion Data.....	66

Introduction

Academic self-concept has been shown to significantly affect student engagement and achievement (Hudley, Daoud, Polanco, Wright-Castro, & Hershberg, 2003; Akey, 2006). First Nations College serves adult First Nations learners, age 17-65, offering from basic literacy programs to grade 12 high school subjects. The majority of students are attending because they have been previously unsuccessful in regular high school classes. The high school level students are fully competent in their ability to complete assignments and achieve their learning goals; however, they generally lack confidence in their ability. This action research project explores ways that teachers can make a difference for increased success and college completion for First Nation students.

Adult First Nation students face multiple learning barriers. These students possess an incredible desire to further their education to create a better life for themselves and their families. The external factors that lead to learning barriers are not things teachers can significantly address in the classroom. Teachers can only work with the factors or conditions that affect student learning within the classroom. These key factors include such things as: providing a safe and caring environment, varied instruction, structured lessons that ensure success, having high but reasonable expectations, boosting self-esteem through frequent positive reinforcement, and using technology to engage students. Given the past 20 years of teaching this population of students, I have concluded that the primary factor leading to my students achieving their learning goals is knowing that I truly care about, and support, them. For my research, I want to determine to what extent implementation of practices to increase student's academic self-concept will increase student engagement and academic achievement.

Background

Extensive research exists to show that engagement is essential to student success and learning. Researchers agree that students that are engaged “learn more, retain more, and enjoy learning activities more than students who are not engaged” (Akey, 2006, p. 3). Behavioral engagement entails the things students do for continual involvement in learning (Hudley, Daoud, Polanco, Wright-Castro, & Hershberg, 2003). It includes behaviors such as persistence, effort, and attention (Akey, 2006; Ainley, 2006), and would be reflected in: on-task behaviors, study behaviors, low absenteeism, participation during class discussions, and task completion (Hudley, Daoud, Polanco, Wright-Castro, & Hershberg, 2003). Affective engagement involves attitudes or feelings about learning (Hudley, Daoud, Polanco, Wright-Castro, & Hershberg, 2003), as well as reactions to classroom, school, or teacher (Ainley, 2006). Affective engagement includes motivation, positive learning values, enthusiasm, interest, boredom, happiness, anxiety, fear, pride in success and achievement striving (Akey, 2006; Ainley, 2006; Hudley, Daoud, Polanco, Wright-Castro, & Hershberg, 2003). Cognitive engagement represents cognitive forms of investment in learning. It includes measurement of goals, cognitive strategy use, attention, task mastery, and preferences for challenging tasks (Ainley, 2006).

Academic self-concept refers to the students’ perception of their personal ability to succeed. Other terms used include ‘self-efficacy,’ ‘ability perception,’ ‘competence beliefs,’ and ‘perceived academic competence.’ Substantial research indicates that academic self-concept significantly affects student engagement and achievement (Hudley, Daoud, Polanco, Wright-Castro, & Hershberg, 2003; Akey, 2006).

Review of the Literature

Academic self-concept is the belief that a person can be successful on specific academic tasks (Margolis & McCabe, 2004). Academic self-concept involves “students’ self-perceptions of their academic accomplishments, their academic competence, their expectations of academic success and failure, and academic self-beliefs” (Marsh, Seaton, Trautwein, Ludke, Hau, O’Mara, & Craven, 2008, p. 322). It is strongly influenced by student achievement and can predict future achievement, coursework selection, and educational attainment (Marsh et al., 2008). There are five relevant themes of academic self-concept that will be discussed in the review of the literature: the implications of ability perception on student engagement and achievement, the competence beliefs of First Nation learners, promising implementation practices, characteristics of adult learners, and action research as a method of implementation.

Implications for Engagement and Achievement

Marsh and O’Mara (2008) clearly distinguish between the definitions of self-esteem and academic self-concept. Self-esteem is considered the holistic general term that includes physical, social, and academic components. Academic self-concept is a personal self-perception of academic ability and is formed through ongoing experiences and interpretations of those experiences. Marsh and O’Mara (2008) argue that specific academic outcomes significantly relate to competence beliefs but not necessarily to self-esteem in general. They conclude that due to the reciprocal effects of ability perception and achievement, teachers should focus on both raising perceived academic competence and performance together.

According to Marsh et al. (2008) “in its simplest form, the big-fish-little-pond effect (BFLPE) predicts that students have lower academic self-concepts when attending schools where the average ability levels of other students is high compared to equally able students attending schools where the school-average ability is low” (p. 320). This means that when a student of average ability attends a high-ability school, they will likely have below average competence beliefs. If the same average ability student attends a low-ability school, they will likely have above average competence beliefs. Ultimately, it is not the students’ actual ability that matters, rather it is their perception of how they compare to the other students (Marsh et al., 2008). This may have implications for grouping students of similar ability as is done in First Nation adult upgrading programs.

When students learn information or skills, they also learn they are capable of learning, and academic self-concept increases. Conversely, when students fail to learn information or skills, they also learn to believe that they are incapable of learning, and academic self-concept decreases. If students with low competence beliefs perceive tasks as unattainable their perception of low ability will “contribute to decreased success expectancies and consequently, to reduced interest in expending effort to perform the task” (Valle, Cabanach, Nunez, Gonzalez-Pienda, Rodriguez, & Pineiro, 2003, p. 560). High academic self-concept leads to intrinsic motivation and increased interest in the task.

There are two types of academic goals: learning goals and performance goals.

Learning-goal oriented students engage in learning to acquire knowledge and increase their competence, they consider effort the main cause of success or failure, they conceive of intelligence as a variable and modifiable characteristic,

they view difficult tasks as a challenge, and they use deep processing strategies more frequently. (Valle, et al., 2003, p. 560)

Students with high academic self-concept tend to be learning-goal oriented, they trust their ability, assume more responsibility for their results, and display higher levels of engagement, effort, and persistence, all leading to higher academic achievement. For learning-goal oriented students, more effort usually results in improved learning and increased competence. Effort-ability relations and perceptions of control and personal responsibility for academic results contribute positively to development of learning-oriented motivation. (Valle, et al., 2003).

Performance-goal oriented students are more interested in showing their ability, obtaining favorable judgments of their competence levels and avoiding negative ones, they regard learning as a means to prove their competence, they consider intelligence as a fixed and stable trait, they perceive difficult tasks as possible failure situations, and they use low-complex level strategies more frequently. (Valle, et al., 2003, p. 560)

Students with low academic self-concept tend to be performance-goal oriented, they may not trust their ability, tend to avoid responsibility for their results, and display lower levels of engagement, effort, and persistence, all leading to lower academic achievement.

Supportive teachers and clear high expectations about behavior can increase academic self-concept. Akey (2006) recommends teachers begin to build students' competence beliefs as soon as possible. She argues that "to become successful, students need to know what it takes to succeed and believe they can succeed, given what they know" (p. 4). If students think they lack the skills to complete an assignment they are unlikely to even

attempt it. Students with low academic self-concept tend to show greater anxiety in the classroom and are fearful of others discovering their ignorance which would lead to embarrassment and humiliation. These concerns may inhibit students from asking for help when confused, and from putting much effort into a task. By not exerting effort on a task the student can offer an excuse for low ability or lack of knowledge (Akey, 2006). Margolis and McCabe (2004) also find that without sufficient competence beliefs many learners that struggle will not exert the necessary effort to complete assignments.

The research of Akey (2006) identified that ability perception is a greater factor in academic achievement than engagement. When students have a high academic self-concept they become more engaged and learn more. When students have low academic self-concept they are unlikely to attempt academic tasks or exert much effort. Previous successes are needed to raise competence beliefs. She recommends that school contexts need to be designed to encourage and support academic self-concept. Her study found that both supportive teachers and clear expectations increased ability perception. Other factors that increase academic self-concept include challenging and attainable academic goals, students' collaboration, and meaningful subject matter (Akey, 2006). Her findings suggest that competence beliefs can be increased at any point in a student's education. This is a significant finding when teaching adult learners.

Ommundsen, Haugen, and Lund (2005) indicate that students with low academic self-concept may use self-handicapping - they may deliberately delay studying until the last minute so that if subsequent performance is low they can blame the circumstances, not their ability. Seo (2008) agrees that low ability perception may lead to delaying or avoiding academic activities. He argues that interventions aimed at increasing students'

competence beliefs may help overcome procrastination. Students with high academic self-concept see intelligence as a modifiable entity that can be increased by effort. High ability perception motivates students to pursue their goals, even in the face of obstacles and setbacks. Students with high academic self-concept attribute their success to their abilities and effort and feel they have control over their outcomes. They are task-focused, have a high expectancy for success, and know that they have what it takes to succeed. They show evidence of sustained effort on academic tasks, have increased attention to tasks, are deep learners, and feel in control of their learning.

Students with low academic self-concept tend to take precautions to protect what competence beliefs they have by using self-handicapping strategies to provide a non-threatening excuse should failure occur. They see intelligence as a fixed entity that is not affected by effort, thus are surface learners. They do not have a sense of control of their learning, and do not believe they can increase their learning by using more effort. This can lead to a cycle of self-fulfilling prophecy strengthening low academic self-concept leading to lower achievement. Ommundsen, Haugen, and Lund (2005) contend that it is of practical importance to promote “an incremental rather than a fixed conception of ability among students” (p. 471), to use mastery based learning, and to foster a classroom culture that values hard work and sustained effort.

Marsh and O’Mara (2008) showed that there is a reciprocal effect between not only academic self-concept and achievement, but also between ability perception and educational attainment. This means that high competence beliefs lead to better performance on achievement measures and higher educational achievement; and both lead to increased academic self-concept. Some of the benefits of high ability perception

are reduced test anxiety, staying in school rather than dropping out, and higher levels of educational attainment.

Guay, Larose and Boivin (2004) wanted to determine the long-term effects of academic self-concept concerning factors in childhood that may affect adult life. They find that “among equally able students, those who perceived themselves as competent in school activities attain a high educational level in young adulthood” (p.64). Children with high competence beliefs have higher educational attainment level that is not necessarily related to the fact that these children may benefit from more family resources.

It is suggested that, “interventions designed to enhance academic self-concept such as praise, feedback, and attribution training would be useful. Such interventions may plant the seeds of later school adjustment and healthy functioning” (p. 64).

Ability perception influences persistence, performance, activity choices, educational attainment level, goal setting, willingness to expend effort, and engagement. It is related to the number of school terms completed, and in math and science, it predicted persistence over and above contributions of ability measures. Competence beliefs, over and above prior academic achievement predicted educational attainment level ten years later while controlling for family socio-economic structure, family structure (one or two parent), and for academic achievement (Guay, Larose & Boivin, 2004).

The importance and potential of long-term monitoring of students’ academic self-concepts and their actual performance on achievement measures is illustrated by Cleary (2009). He argues that tracking ability perception measures provides data that can be used by teachers to modify instructional strategies or motivational interventions depending on

whether students are overestimating or underestimating their achievement. The author states

The use of self-efficacy measures in schools is ideal because they are brief and easy to administer, are free from reactive effects, are strong predictors of academic outcomes, and can be flexibly adapted to specific behaviors across most academic contexts. (p. 168)

First Nation Learners

Several researchers have studied the effects of academic self-concept on high school and adult First Nation learners. Statistical studies identified by House (2003) show that First Nation students are more than twice as likely to withdraw or drop out of high school compared to general students. First Nation students who complete high school also have lower rates of undergraduate and graduate degree completion than other minority students, and are less likely than other students to have SAT scores high enough to be eligible for admission to post-secondary programs. It has been suggested that standardized tests may yield invalid scores for First Nation students and that alternative assessment strategies, such as performance-based assessment and motivational levels, be considered when selecting First Nation students for educational programs and when designing instructional experiences. First Nation students may learn more effectively from cooperative learning environments as they reflect cultural values transmitted by First Nation tribes. Colleges should have activities that foster tribal values, reduce feelings of isolation, and incorporate family involvement. Students with high competence beliefs have higher expectations of graduating with honours and higher grade point averages in language and math classes. This study by House (2003) demonstrates that

high academic self-concept leads to higher academic achievement for First Nation learners as similarly demonstrated in general populations of learners.

It has been hypothesized that stigmatization of First Nation students as poor academic achievers may explain negative attitudes toward school and low competence beliefs. Hinkley, McNery and Marsh (2002) argue that the persistent underachievement in First Nation students may be due to stereotype threat. Their study examined First Nation learners who were typically stereotyped as underachievers to determine the effect of high and low academic self-concept on achievement. The authors believed that students were likely to internalize a sense of inferiority due to a lifetime of exposure to society's negative images about their ability. They speculated that when achievement faltered, student ability perception would decrease, which in turn would undermine future achievement, leading students to avoid academic achievement. Their study also examined whether First Nation students who were stronger in their social identity had higher competence beliefs than students who were less strong in their social identity. Traditional students spoke their native language at home and lived in rural locations. Non-traditional students spoke English at home and lived in towns. The research study found that high academic self-concept positively correlated with academic achievement, and negatively correlated with performance avoidance and absenteeism. Low academic self-concept positively correlated with performance avoidance and absenteeism and negatively correlated with academic achievement. The study found no support for any differences in ability perception between traditional and nontraditional students (Hinkley, McNery & Marsh, 2002).

Promising Instructional Practices

Margolis and McCabe (2006) identify four sources of information from which students obtain competence belief information. “Enactive mastery” refers to the awareness of the degree students are successful in their performance on tasks. “Vicarious experiences” involve observing the behavior of others. “Verbal persuasion” provides information for students to interpret and assimilate. And, “physiological reaction or state refers to how students feel before, during, and after engaging in a task” (p. 220).

Academic self-concept can be raised by key practices that focus on specific tasks or subjects as described by Margolis and McCabe (2004).

1. Linking new work to recent successes. This requires that teachers ensure some successes by shortening or simplifying the work, limiting the number of assignments, and staying at the learners’ proper instructional level. Teachers need to explicitly show and ask students how new work resembles previous successes and reinforce what they did to succeed. Reviewing prior successes also allows teachers to show learners how to evaluate their own work and keep track of their successes, and to teach learners to attribute success to controllable factors like effort, proper use of strategies, and perseverance.
2. Teaching learning strategies. Many learners need to be explicitly taught new learning strategies, such as using modeling, and need frequent feedback and opportunities for guided practice before practicing independently.
3. Reinforcing effort and persistence. Teachers need to help learners realize that they have the skills to succeed, provide them with help and encouragement, and show them how to correct their mistakes. Success should require reasonable moderate effort, such that tasks are viewed by learners as doable, not impossible (Margolis & McCabe, 2004).

4. Stressing peer modeling. The most powerful models are those with whom students identify and are closely connected (Martin & Dowson, 2009).

Peer models can show learners how other students, similar to them, make and overcome mistakes in acquiring and applying new skills and learning strategies. Models should explain their actions, step-by-step, correct mistakes and verbally attribute failures to controllable factors such as poor effort and attribute successes to controllable factors such as using a strategy correctly or ability. (Margolis & McCabe, 2004, p. 245)

5. Teaching learners to make facilitative attributions. Successes must be associated with “controllable factors, such as effort, persistence, and the correct use of learning or cognitive strategies” (Margolis & McCabe, 2004, p. 245). Poor performance must be associated to the same controllable factors, but emphasize what students did not do. In the use of facilitative attributions success is linked to ability, such as learned intelligence, and poor performance or failure is separated from ability.

6. Assisting students create personally important goals. Goals need to be “short-term, specific, and achievable” (Margolis & McCabe, 2004, p. 245).

Seigle and McCoach (2007) argue that factors affecting ability perception include students past performance, observations of other students as models, and verbal persuasion. They recommend the following practices for increasing student academic self-concept:

1. Reviewing lesson accomplishments from the previous day, posting the current lesson’s objectives prior to instruction, drawing attention to the lesson objectives as they are covered, and reviewing the lesson objectives at the end of the lesson.

2. Asking students to record each day on a calendar something new they learned that day or something at which they excelled.
3. Prompting students who perform poorly to attribute their failures to lack of effort and encouraging them to try harder.
4. Drawing students' attention to their growth and complimenting them on their specific skills.
5. Using student models early to demonstrate some aspects of a lesson to remind them that other students like themselves are mastering the material and therefore they can master it also. (p. 279)

The study by Seigle and McCoach (2007) involves the use of specific instructional practices:

1. Teacher feedback - with teachers complimenting students on their abilities and skills acquired rather than on effort. Lack of effort, confusion, or reliance on inappropriate strategies is used as an explanation for failure, while ability and effort is used as an explanation for success. Compliments are specific to tasks to draw attention to students' skills and past performance.
2. Goal setting - with activities designed to draw students' attention toward their successful performances. Goals include specific performance standards. Students help decide how larger goals can be broken down into smaller attainable goals.
3. Modelling - with students observing fellow students successfully completing similar tasks. "Models who are similar or slightly higher in competence provide the best opportunity for students to assess their self-efficacy" (p. 285). Modelling can be implemented using peer tutoring, work groups, and class demonstrations (Seigle &

McCoach, 2007). The authors find that minimal training of teachers in new instructional techniques has a significant effect on academic self-concept and achievement.

Characteristics of Adult Learners

The students that enroll in adult upgrading programs may occupy very different positions in the class, race and gender hierarchy than the instructors and others who make decisions about them. It follows then, that these students may have different ideas, goals, and reasons for learning, and political interests than their instructors. Instructors must understand the role of adult upgrading programs in the lives of learners before they can choose appropriate pedagogy, organize curricula, or contextualize programs. These learners can not be expected to fully participate in programs defined by their instructors that ignore the things they know, feel, and live everyday. Research shows that the learners in adult upgrading programs need literacy as well as an expansion of existing opportunities for education (D'Amico, 1999).

Adult learners are different from children in many ways. Vickerman (1996) lists some basic principles essential to effective adult learning that should be acknowledged in adult upgrading programs:

1. The adult should be able to see immediate benefits from the learning experience.
2. The adult must want the instruction; he/she must be self-motivated.
3. The adult needs specific, concrete, practical, life-like learning situations.
4. The adult learns best through active participation in classroom activities.
5. The adult has experiences and interests to which new material should be related.
6. The adult requires subject matter adapted to his/her needs and capabilities.

7. As a voluntary, part-time student, the adult learns best in a supportive environment.

Learning is more meaningful when adult interests are met by teachers who show personal interest in the learner.

8. A teacher should choose teaching methods that accommodate special adult interests.

(p. 71)

Knowles (1980) identifies that adult learners have some unique characteristics that make them different from children or youth that must be attended to. His main characteristics of adult learners are:

(a) they have a deep psychological need to be self-directing, (b) they bring into any learning situation resources from their previous experience and training that is a rich resource for one another's learning, (c) they are task-centered, problem-centered, and life-centered in their orientation to learning, and (d) they are intrinsically motivated to learn, given the right conditions and encouragement. (p. 99)

He recommends that adult learners be taught to diagnose their own learning needs and make contracts of their learning goals.

Action Research

Shifferraw and Burton (2008) report that action research involving teachers and learners in an adult upgrading program yielded positive results. Teachers reported improvements in attendance and reading skills of adult learners and the use of more authentic learning materials in classrooms.

According to "Leading a Research Engaged School," action research is often referred to as practitioner research. It involves research into what students think and how they

behave, and includes a commitment to taking some form of action as a result of the findings (Earnes, Sanders, Sharp & Tomlinson, 2006). The Alberta Teachers Association (2002) suggests a number of factors that should be taken into consideration before planning action in their “Action Research Guide.” These steps include a project purpose, awareness of potential stakeholders of the issue, the desired impact of the project, the number of participants involved, and the time and resources available.

Action Research involves the teacher researcher identifying real problems of everyday practice, suggesting solutions, planning, and implementing an intervention. The teacher researcher evaluates the success of the intervention in solving their identified problem (Cohen, Manion, & Morrison, 2007). Action research may be proactive, with data collection and analysis following action, or responsive, with data collection and analysis preceding action. Ultimately, action and research will alternate as the action research progresses through cycles (Schmuck, 1997). Kemmis (2006) argues that one of the most critical elements of action research is that it requires

Truth-telling both with respect to the truths that arise from our work (our findings) and the methods by which we arrive at them. It requires that we critically evaluate how we have done our work – whether our findings are justified by our methods. It requires truth-telling among co-participants in projects, with the wider communities and institutions we serve. (p. 475)

“Action research consists of planned, continuous, and systematic procedures for reflecting on professional practice and for trying out alternative practices to improve outcomes” (Schmuck, 1997, p. 29). Reeves (2004) argues that there is little value in gathering information on professional practice unless it includes regular reflection.

“Reflective practice may be used to help in the refinement of an individual’s expertise in practice, as it requires only the commitment of the individual, is internal to the practitioner, can be done in isolation, and requires no reporting to others” (Townsend, 2001, p. 16).

Schmuck (1997) recommends using reflective journaling to become more aware of our past, present, and future behaviors, and the consequences of those behaviors. He comments that

Educators who do not think about the future cannot contemplate the results of their actions. Educators who do not think about the past cannot ready themselves for change. Educators who do not think about the present cannot understand what to do next. (p. 3)

Free writing to facilitate reflecting is suggested. This involves writing down all thoughts without concern for sentence structure then, after reflecting on those writings, clarifying ideas with further reflection until a piece of polished writing is achieved.

Korthagen and Vasalos (2005) suggest that basic reflection involves the aspects of environment, behavior, competencies, and beliefs. They list the following guiding questions for teachers to consider: “What was the context? What did you want? What did you do? What were you thinking? How did you feel? What did the pupils want? What did the pupils do? What were the pupils thinking? How did the pupils feel?” (p. 50).

According to Korthagen and Vasalos (2005) this level of reflection is not sufficient. They argue that deeper “core” reflection involving aspects of identity and mission can only be achieved by thoughtfully considering: “What is the ideal situation – the situation which

the teacher wants to bring about? What are the limiting factors preventing the achievement of that ideal?" (p. 54).

Competence beliefs can be altered at any point in a student's education since it is formed through ongoing academic experiences and interpretations of those experiences. Perceived academic successes lead to increased academic self-concept and future achievement, while perceived academic failures lead to decreased academic self-concept and lack of future achievement. As a teacher of adult First Nation students, I must be aware of the potential impact of every assignment and test on my student's ability perception. I need to ensure the use of practices, such as providing feedback to students on their work then allowing them to correct or redraft their work before submitting it for marking, to increase student success. I also must teach students to attribute success to both ability and effort, and failure to lack of effort to decrease student self-handicapping. It is important to convey to my students that ability is not fixed; rather it can be increased with effort. Action research on the impact of academic self-concept on adult First Nation students is needed so that teachers can maximize the learning potential of these students. I believe that my job as a teacher is not just to pass on knowledge and skills, but to instill a belief in the ability to learn throughout life.

Method

This project employs an action research plan. The action research project was implemented with 24 students at a First Nations college over a period of five weeks. Valid data was collected from seven grade 11 Chemistry 20 students, seven grade 11 Biology 20 students, and ten grade 10 Science 14 students. Students completed surveys, wrote both daily and weekly journal entries, and completed pre- and post tests for three

units of study. The format of the plan is based on the process recommended by Townsend (2001).

1. Focus/Problem

To what extent will the implementation of specific instructional practices increase adult First Nation students' academic self-concept, student engagement, and achievement in Science? Based on the general research problem, a series of sub-questions were identified to help guide the action research plan.

- a) What is student engagement and how can it improve student achievement?
- b) Can the teacher researcher use the literature to develop an understanding of the factors affecting student engagement?
- c) Can the teacher researcher create goals involving the engagement factors of students' perceived academic competence?
- d) Can the teacher researcher gain a better understanding of how students' perceived academic competence affects student engagement?
- e) Can the teacher researcher plan, implement, evaluate, and reflect on the specific factor of students' perceived academic competence how it affects engagement?
- f) Will student engagement and achievement increase within the classroom?
- g) Will student engagement and achievement increase within First Nations College?

2. Collect Background Information and Resources

I have been teaching at First Nations College for 20 years and have witnessed many students succeed that were expected to fail. Former students occasionally give me

feedback about their experience in my classroom. Students identify that the most important learning they achieved with me is the belief that they have the ability to succeed, and that their perseverance will pay off. A recurring comment was that the strong teacher-student relationship was the force that kept them motivated to get up and go to school each day, knowing that I would be there to support them. This action research plan collected data to provide evidence to show that adult First Nation students' perception of academic competence is a critical factor in student engagement and achievement.

The purpose of this research project is to address the problem of low achievement and completion rates of some adult First Nation learners by implementing a series of teaching strategies to increase student perceived academic competence that should result in an improvement (Akey, 2006). The academic staff of First Nations College, comprising only ten full-time teachers, is aware of the issue of low student achievement and completion as our student numbers dramatically decline throughout each semester. Due to the small size of First Nations College teaching staff, and current teaching assignments, I have focused on my own students in the 2009 academic year. The administration frequently expresses concern about the low achievement and completion rates and encourages all teachers to take action to address the problem. They are in complete support of any program that will have a positive impact on student learning and retention. If the implementation of my action research plan has even a slightly positive outcome, administration will strongly encourage all teachers to implement similar practices.

According to "Leading a Research Engaged School," staff time is the main resource required for research activity (Earnes, Sanders, Sharp & Tomlinson, 2006). The time

available to engage in implementation of my research plan included a preparation period in the first semester and my personal time. The challenge was to commit to making time to reflect on the plan and make changes accordingly during implementation. There were limited financial resources available to support the action research plan but costs were minimal, with a single researcher and small class sizes.

The action research plan proved to be important to the students, teachers and administration of First Nations College because we have a common goal to better meet the needs of our unique student population and increase student achievement and completion rates. This plan is also important to First Nations High School because their students face similar barriers to success. Any research activities that help promote learning among teachers, encourage teachers to empathize with learners, and help students recognize that teachers are learners too, are beneficial (Earnes, Sanders, Sharp & Tomlinson, 2006).

The “Action Research Guide” of the Alberta Teachers Association (2000) stresses that researching knowledge of the problem and determining what others have learned, are valuable uses of time and will assist you in refining your research question and determining the most appropriate interventions. Three strategies to develop background knowledge are suggested; “talking” to knowledgeable people, “reading” appropriate literature, and “learning” from workshops or conferences. I have very limited opportunities to talk to experts or attend workshops so the main source of background research comes from a literature review.

3. Make Sense of the Information

From twenty years of experience teaching this unique student population a significant number of my students have verbalized low academic self-concept and displayed poor engagement, achievement, and completion. My ethnographic research as participant research implemented specific instructional practices to increase academic self-concept which I felt increased engagement, achievement, and possibly completion.

4. Report and Discuss

Throughout the implementation of the plan, ongoing discussions with administration occurred to ensure they were fully informed about the project and to receive suggestions for improvement of the plan. If this action research plan intended to increase students' perceptions of self-worth, achievement and/or completion rates shows even slight improvement over the brief implementation period, it will be considered a success.

5. Plan Action

During the first week of classes of the fall semester, and as implementation progressed, the intention was to:

- Gather baseline data regarding students'
 - o Current academic self-concept level using a Likert type survey.
 - o Knowledge of Science using a pre-test.
- Introduce reflective journaling using free writing to collect information regarding students'
 - o Previous reasons for lack of attendance.
 - o Previous reasons for lack of completion of courses.
 - o Feelings about learning Science.

- Thoughts regarding their ability to learn Science.
- Document attendance, noting the approximate number of minutes of class missed due to arriving late.
- Document completion of tasks, noting if completed when due or submitted late.
- Write journal reflections weekly of my experiences, thoughts, feelings and learning throughout the implementation using guided questions (Appendix C).
- Conduct pre- and post-tests on each unit of study.
- Conduct academic self-concept scales before unit tests.
- Continue requiring students to use reflective journaling with guided questions requiring structured writing to comment on their learning experiences and feelings weekly.

6. Take Action

Numerous practices to increase students' perception of academic performance and perceived teacher support have been noted previously. Many of the practices were currently in use to some extent in my classroom and would continue to be employed. This action research plan implemented practices that I did not use to any extent before this study. Specific practices to increase students' perception of academic performance included:

- Requiring students to briefly record in a journal something new they learned or something at which they excelled each day;
- Requiring students to journal reflectively about their experiences and feelings weekly. Initially using guided free writing then progressing to structured writing;

- Explicitly teaching students to attribute their successes to a combination of ability and effort, and their failures to lack of effort or to confusion or reliance on inappropriate strategies;
- Visually displaying the lesson objectives at the beginning of a class then explicitly showing students how they achieved those objectives at the end of the lesson;
- Linking new work to prior experience in a more explicit manner. This may involve an extensive review of previous concepts for students with poor attendance; and
- Increasing my level of demand by raising my expectations of student achievement and assignment completion.

A variety of measures of evidence of success used include;

- Increased scores on the academic self-concept scale
- Increased scores on tests
- Increased attendance rates, both time in class and days present
- Increased task completion, both when due and late; and
- Increased quality and quantity of writing in journals, in regard to literacy skills,

Science knowledge, or effective communication skills.

The implementation of the study proceeded as planned with no significant changes. The student journals were not assessed for literacy skills as was intended.

August 2009

- Located a survey for academic self-concept assessment; the Science Motivation Questionnaire (SMQ), (Glynn, Taasobshirazi & Brickman, 2007). It is a thirty question survey that was used to measure changes in student academic self-concept in science courses (Appendix A).

- Developed student reflective template for weekly reflective journaling feedback (Appendix B).

- Met with administration to discuss the project

- Developed template to record attendance and task completion data

- Began my reflective journaling regarding the preparation for implementation

September 2009

- Conducted pre-test in Science knowledge for each unit of study

- Conducted initial academic self-concept scale

- Conducted initial reflective guided free writing, introducing the format and expectations assuring students of confidentiality (I kept journals locked in the filing cabinet)

- Recorded attendance and task completion data

- Began implementing new teaching practices

- Continued reflective journaling

- Conducted post-test of each Science unit

October 2009

- Continued the process stated in September, reflecting in and on action and making adjustments in instruction

- Continued reflecting and analyzing the results

7. Collect Information

Both quantitative and qualitative data were collected for this action research.

Quantitative data included attendance records, achievement results (pre- and post-test), task completion information, and on-going Science Motivation Questionnaire scores.

Qualitative data included ongoing journal entries and anecdotal comments. The teacher/researcher kept field notes on observed behaviors such as time on-task during select assignments, activities and tests. The students self-reported on perceived ability and learning.

The Freedom of Information and the Protection of Privacy Act was considered in the protection of individual privacy. No data is reported that could identify or potentially harm an individual.

8. Analyze and evaluate in a continuous way

The data collected was analyzed to determine the success of the action research plan. The quantitative data compared at the end of each unit of study to the previous unit determined if academic self-concept scores, attendance rates, average grades, and/or completion rates changed. The qualitative data was evaluated on an ongoing basis throughout implementation of the plan to monitor if students attitudes and/or perceptions appeared to change and/or influence achievement, as well as to monitor literacy and communication skills. This allowed for ongoing reflection of what I did, what I learned from it, and what I modified during implementation.

9. Assess Achievements

I discussed the research and my analysis of it at the end of each unit of study with a colleague and requested feedback. Several recommendations were made that were subsequently implemented. After speaking to several students outside of class to obtain more detailed information regarding their learning difficulties, several assignments were altered. I also used my reflections and student suggestions to guide the implementation for the following unit of study. Modifications included assigning students to write

definitions for all the key terms in each chapter to assist in studying for the tests, and providing one class period before each exam designated as a study period.

10. Publish results and conclusions

The results were shared with colleagues after each unit was analyzed. Copies of the final report have been made available to colleagues.

11. Celebrate

The classes celebrated at the end of implementation with doughnuts, coffee and extra study periods. A celebration with a special acknowledgement of participating classes of students is planned for the school year end awards ceremony.

12. Future Action

This process may be repeated using a different action research question next year. It is expected that the results of this project be shared in a presentation at the Treaty 7 Education Conference next fall.

Data Collection

A considerable quantity of valuable data was collected for analysis (Appendices). The Science Motivation Questionnaire (Glynn, Taasoobshirazi & Brickman, 2007), was used to measure academic self-concept four times during the implementation period. Brief one or two sentence daily comments, and paragraph length reflective weekly journal entries were collected throughout the five weeks. Attendance and task completion data was recorded on a daily basis, and pre-test and post-test data were collected for three curriculum units.

Results

Daily journaling and completion of the survey by students were sometimes rushed. Students completed the surveys at the end of the class period and some were in a hurry to switch classes or leave for the day. I needed to plan more time for it than five minutes. The weekly reflective journaling was implemented at the beginning of the class periods and students took more time to put thought into their answers.

Visually displaying class objectives and explicitly how they were achieved was implemented consistently. There were some class periods that I did not find time to write the objectives on the board, rather I just verbally expressed and drew attention to them. I stated the learning objective at the beginning of a lesson to focus students and reviewed previous learning, remind students the purpose of the lesson in the middle, and then reinforce what they were supposed to have learned at the end of the lesson. This process allowed me to explicitly link the new concepts to previously knowledge.

As the course progressed I gradually raised my expectations of both the completion of assignments and requiring them to be handed in when due. The first chapter fell during add/drop week so there was no penalty for handing work in late. I marked each assignment as quickly as possible and returned it so students could use it to study for their test. During the second chapter, assignments that were handed in late were moved to the bottom of the marking pile and students ran the risk of not receiving the work back before the test.

In the third chapter, I held the late assignments until after the test. This was done mainly to prevent a few students from copying other students work, but also to pressure students to hand in their work when due. Most students responded positively and worked

hard to hand in assignments, a few students responded negatively and waited until the graded work was returned to students before trying to submit their work. Allowing students to redo and resubmit assignments led to increased marking for me but a more positive attitude about their leaning for the students. The process of correcting their mistakes led to increased learning.

I discussed the ongoing implementation of my action research plan with my colleagues and received some verbal feedback from them. One teacher suggested having students write out the definitions for each chapter as a study guide. My students responded favorably to this additional assignment. Another teacher recommended having individual chats with struggling students after class. I found this helpful in terms of finding out reasons for absences and lack of completed work but it did not increase attendance or the number of assignments completed. Unfortunately I did not find time to arrange for a teacher or administrator to observe any of my classes to receive further feedback.

Measures of Academic Self-concept and Student Engagement

The Science Motivation Questionnaire (Glynn, Taasobshirazi & Brickman, 2007) has 30 questions and uses a scale of one to five leading to a maximum score of 150 (Appendix A). Each of six sub surveys consists of five questions with a maximum score of 25 each. The students completed the Science Motivation Questionnaire on the first day of classes, then before each of the first three chapter tests. Students found the survey to be long and time consuming to complete. Some students invalidated their surveys by filling in all fives, even on the reverse scored items; consequently their data was not included in the 24 students listed above. The initial results of the survey were inconsistent, reflecting

that many students had not attended school for a number of years. The results of the second and fourth surveys provided a spread of over three weeks to determine any changes in academic self-concept. The entire group survey increased a mere 0.2% in their average score from the second to fourth surveys. More significant findings are apparent when looking at the sub surveys within the Science Motivation Questionnaire (Appendices E and F).

On both the 'intrinsically and extrinsically motivated science learning' sub surveys, all classes decreased in their scores. I am unsure why these scores decreased.

The 'relevance of learning science to personal goals' sub survey showed the group as a whole increased 0.3%. The Biology 20 students decreased 2.8%, the Chemistry 20 students increased 2.8%, and the Science 14 students increased 1.6%. The decrease in the biology class score may be due to one student deciding she hated biology and changing her career goal to omit any further requirement of the class.

The greatest increase of the entire group was on the 'responsibility (self-determination) for learning science' sub survey. Scores rose 4.8%, with increases of 1.2% in Biology 20, 4.6% in Chemistry 20 and 7.6% in Science 14 students. These increases are likely due to the emphasis I placed on the responsibility of students to monitor their own progress, and actively seek help when they did not understand.

On the 'confidence (self-efficacy) in learning science' sub survey the group score increased 1.8%, with rises of 2.8% in Biology 20, 2.8% in Chemistry 20, and 0.4% in Science 14. The higher scores in the biology and chemistry classes may be due to the fact that those students have had more success in science in the past as evidenced by their

grade level, and many were returning students from the previous semester. The majority of the Science 14 students were new, and had not taken a science class for many years.

The ‘anxiety about science assessment’ sub survey also demonstrated a distinction between the grade 10 Science 14 class with a decrease of 4.0%, and the grade 11 Biology 20 class increase of 7.4%, and the Chemistry 20 class increase of 8.6%. The students in the higher grades appeared to have less anxiety regarding their test scores. The students taking Biology 20 and Chemistry 20 chose to take the classes and maintained overall better attendance than the Science 14 students who primarily had no choice but to take the class due to the current timetable.

Student journals were used to answer weekly reflection questions (Appendix B), and record daily learning. Student responses to the reflection questions yielded a great deal of information supporting both academic self-concept and student engagement. The weekly reflection questions, a summary of the main responses, and a sample of some of the more meaningful or unique comments are included and discussed below:

August 31, 2009 Reflective Journal Questions

1. What are previous reasons for lack of attendance and/or lack of completion of courses?

- “laziness”
- personal problems
- transportation problems
- death in family
- not understanding concepts
- sickness
- parental responsibilities
- pregnancy
- employment
- not being involved in the class

This question gave me some background on the students so I was more prepared to meet their needs by being sensitive to those experiencing crises, making referrals to agencies

that might provide assistance, and ensuring that all students participated in class activities. In some of the self-reported comments, students expressed their previous learning behaviors in a negative manner, reflecting their academic self-concept.

2. What are your feelings about learning science? Most student responses indicated positive feelings about taking a science class, but some were clearly experiencing anxiety.

“I feel motivated for learning science. I’m excited to take on a career in the science field. Sometimes I become discouraged with work that is long and strenuous, but I overcome it when I think about the effects it will have on my grade.”

“I have always been intimidated of science classes.”

“I feel it is a very important part of my future education.”

3. What are your thoughts regarding your ability to learn science? The majority of students commented that they were somewhat confident that they were capable of passing the class. Several students indicated they were concerned about their ability to learn science successfully.

“As long as I keep up with the class and homework I should be fine.”

“I am afraid to fail.”

“I hope I am able to grasp the concepts. I am willing to put forth the effort.”

September 9, 2009 Reflective Journal Questions

4. How do you feel about the work you have been doing in science? Most of the students noted that they were keeping up with the work and maintaining acceptable grades. A

number of students were beginning to fall behind due to attendance problems and were experiencing anxiety.

“Science class has always been one of those things that I have never been interested in but since I have been taking it this semester I am starting to enjoy it.”

“I feel overwhelmed at times and frustrated when I don’t understand the science immediately. However, when I do understand the work I feel really good. It is a very rewarding feeling when I do get the work done right.”

“I find it to be very confusing, I really need some help. Some things I can do others I can not. I have missed a few days now and it is getting harder to get caught up but I will try my hardest.”

5. What do you suggest that the teacher keeps the same? The purpose of this question was to determine if the teaching techniques I was using were meeting the learning needs of the students. Most students responded that they were comfortable with my teaching and did not want me to make any major changes.

“The PowerPoint’s, models, and diagrams are very useful tools because I am a visual learner. I suggest more hands-on learning.”

“It is working well because I am still here! The work is good and it helps a lot. All the stuff we are doing is in our everyday lives and I can relate.”

“I suggest that you keep the group activities the same and change nothing.”

6. What do you suggest that the teacher changes or does differently? Very few students offered any suggestions but I made an effort to implement the changes that were recommended.

“More visual or more description would be very helpful.”

“You need to ask more questions of individuals to make sure they understand.”

“Allow more group work and class discussions.”

September 15, 2009 Reflective Journal Questions

7. Compare your pretest and posttest marks. Do you feel that you know and/or understand more about science now that the first chapter is over? All the students that responded to the question indicated that they felt they had learned more about science in the first chapter than they knew previously. The purpose of this question was to draw attention to the successful learning they had accomplished.

“I feel I know and have learned a lot more about chemistry. Even though I don’t get a lot of knowledge out of the text, the teacher helped me create a more visual picture to better my understanding.”

“Yes, I feel like I know more about science, especially since I have absolutely no science background.”

8A. Do you feel good about your marks in science so far? I designed the first chapter test with a low difficulty level in order to promote success. Most students received marks that they were pleased with.

“I feel ecstatic! I worried about my understanding in science but I feel very confident that I can learn it now.”

“I don’t feel so good about my mark. I feel as if I can do better though. I think when I missed class like three days in a row that really got me behind.”

“Well it was a surprise for me, now today I will have a very proud feeling because I really felt lost and I thought I was going to fail for sure. This just makes me think about how I really doubt myself on things like this but seeing 91%, man that’s awesome. It just makes me want to keep getting those marks and I will try my hardest.”

8B. If not what can *you* do to increase it? Most students responded with comments accepting responsibility for their grades and indicating they needed to study more and do more of their homework.

“Make sure I am clear in my answers and study harder.”

8C. If not what can *I* do to increase them? The majority of students did not suggest any specific strategies or techniques that I could implement to increase their grades; rather they accepted responsibility for making changes to their work habits. I regularly reminded students that they had a responsibility to ask for help when they needed it and to keep up with their assignments. I printed out sheets listing all the assignments for each chapter and expected students to check off assignments that were handed in and record their score for each assignment handed back.

“More visual exercises and experiments help me because I am all for the visual learning experience.”

“Walk us through the lessons slowly – baby steps – pause after each important piece of information.”

September 24, 2009 Reflective Journal Questions

9. How do you feel at this point about your learning in science? Most students indicated that they are increasing their learning and are content with their grades thus far. The goal of this question was to continue to draw attention to the learning that was taking place.

“Sometimes I feel overwhelmed when I don’t understand a concept, but when I take the time to work it out, and figure out why, I start to feel normal again and a little more confident. I also feel like I need to get this – it is so important for my career goal.”

“I don’t feel as confident as I normally would. I don’t feel like I’m as prepared, due to the fact that I have limited study time in the evening. I feel frustrated that I am not able to get the grades that I know I am capable of attaining.”

10. Do you feel anything is interfering with you learning science? Explain. The purpose of asking this question was to encourage students to think about balancing the time they spent on each class in addition to the factors in their personal lives that may need to be addressed. Student responses indicated that they have a multitude of personal problems they are facing.

“I’ve been pretty distracted with my personal life. I do realize I need to make sacrifices but it’s hard when you don’t get the support from the people you care most about.”

“I work on weekends from sunrise to sunset, this leaves me exhausted when I should be doing homework.”

“Yes, my attendance. I shouldn’t be so slack and missing class. It’s just I haven’t been in school in a long time, so I’m still getting used to being in an actual class.”

11. What would help you to learn science more effectively? Students mainly responded that they need to read more, study more, and do more homework. Some students indicated that they wanted me to cover less content and do more examples. The goal of this question was to encourage students to consider their role and responsibility in their learning.

“I will keep on trying to organize efficiently enough to make the time.”

“I really need to keep up with the readings and use my spare wiser.”

“More examples and demonstrations.”

September 30, 2009 Reflective Journal Questions

12. Compare your pretest and posttest marks. How do you feel about the amount your grade increased? Student responses reflected that they were generally content with their grades at this point. The question continued to remind students that learning was occurring.

“I’m ecstatic about the grade increase between the pre and posttest. My mark went up 75%. I learned a lot.”

“I am happy my grade went up, it shows that I learned something.”

“I did OK on my test but I think I’m capable of doing better.”

13. Are you doing a reasonable amount of work? The purpose of this question was to draw attention to the fact that many students were falling behind in their work and not handing in assignments when due.

“My fault, my fault, my fault, I didn’t put the work in. I’ve been pretty distracted with my personal life.”

“No, I’m not doing a reasonable amount of work. I know I could spend more time doing my science homework, it’s my social life.”

“Yes, I am working hard to get all of my assignments in.”

14. Are you asking questions when you do not understand? Many students were not asking for help when they clearly needed it, and a few were refusing help. I felt a need to draw attention to their responsibilities as students to take the necessary steps to increase their learning.

“No, I haven’t been asking questions, I’m trying to see if I’ll understand it on my own.”

“Yes, if I don’t understand something, I ask questions to make sure I understand what is being taught.”

“Yes, that’s what helps me understand.”

October 6, 2009 Reflective Journal Questions

15. Do you like having the opportunity to comment on the way you are learning, the way the class is taught, and/or suggestions to help you learn? Explain. I believed that the input of the students was a valuable tool to improve my teaching and their learning. I asked this question to receive concrete evidence that student input is critical to increasing student learning.

“Since I’ve always been kind of an introvert, writing down what I think gives me a chance to vent so yes I do like having this opportunity.”

“Having an opportunity to comment on the way I am learning is important to me and makes me feel like I am actually involved with the course.”

“I do like to have the opportunity to comment on how I am learning because only I know how I can best learn something.”

16. Do you feel that your teacher tried to implement any changes that you suggested? I implemented the suggestions that I felt were reasonable.

“I definitely feel the teacher tried to implement changes I have suggested. I feel that it is why I am better understanding the science today.”

“The teacher has helped with things I don’t understand when I ask.”

“Yes, when we are trying to do projects and have ideas she listens. If we are overworked she lightens the load.”

17. What do you feel your teacher needs to do more or less of to help you learn science more effectively? The purpose of this question was to determine to what extent students would take responsibility for their learning, as well as seeking new suggestions I could use to further increase student learning.

“I think you do a stellar job of being thorough, but a review sheet would be great.”

“I feel the teacher needs more visuals or labs. The labs and having a hands-on approach leads to a deeper broader learner understanding.”

“I do like the labs we do; they help me visualize what we’re doing. I learn better when I’m shown things, like with pictures or models.”

Attendance data (Appendix G) varied with both the grade level of the student and the time of day the class was taught. The class taught first period of the day, Chemistry 20, had the greatest number of late students followed by Biology 20 which was taught immediately following the students lunch break. The number of students arriving late for

class increased in all classes during the five week implementation of the project. This trend was offset by an overall decline in the number of absences. I encouraged students to come to class late rather than not attend at all, and it seemed to have made an improvement in total time spent in class.

The number of absences is difficult to analyze. Students were permitted to change classes during the first five days of class in add/drop week. This directly affected attendance rates. In addition, the H1N1 Influenza A virus began significantly affecting students' attendance in a negative way during the final week of implementation of the project.

Measures of Achievement

A comparison of the pretest and posttest scores showed a clear indication of learning in science (Appendix D). Ninety six percent of the scores from pre- to posttest increased, while 67% of the students test marks increased from the chapter one to the chapter three unit tests.

The number of late assignments handed in was recorded to determine task completion (Appendix H). In the first chapter a total of 46 of 386, or 12% of assignments were handed in late. There was an increase to 80 of 345, or 23% late assignments in the third chapter. By the third chapter, students with poor attendance rates had fallen behind in their classes and were struggling to maintain passing grades. Throughout all three chapters, I strongly encouraged students to complete assignments and hand them in late rather than not completing the work at all. I also continually encouraged students to attend class regularly as ample class time was provided to complete the assignments eliminating the need for homework.

In the first chapter no students resubmitted assignments. The concept of making corrections or improvements to an assignment then resubmitting it to receive a higher grade was foreign to the students. In the second chapter 29 assignments were redone, while in the third chapter 16 assignments were resubmitted.

Personal and Professional Reflections

The week before implementation I was somewhat apprehensive about whether the students would sign the consent forms. During the first day of classes I felt a combination of excitement and anxiety. When I explained the project to my students they responded favorably and agreed that there was value in the study. My concern was regarding the administration and collection of the permission forms by another teacher, whom I repeatedly asked to leave their own class to attend to my needs. My anxiety heightened regarding the permission forms as the week progressed and new students continued to require an explanation of the research study and the time of the other teacher to administer and collect the permission forms. I felt slightly overwhelmed during the entire initial week of implementation of the action research project. The first few days involved training students to journal daily regarding something they learned in each class, introducing reflective journaling and administering the initial survey. I was well organized and fully prepared with lesson plans including the daily objectives that were to be written on the white board each class period so that attention could be drawn to them. All necessary paperwork and handouts for the entire first three chapters in each course that I taught, including the surveys and folders for students to record daily and weekly reflections, were photocopied and assembled in advance of classes.

The implementation of the surveys went more smoothly than I had anticipated. Students did not hesitate or complain about completing the surveys throughout the entire implementation period. I noticed that a few students completed the surveys extraordinarily quickly and I became apprehensive of the accuracy of their results. In the analysis of the surveys the invalid surveys were removed from the data.

Students became quite involved in and were particularly keen to answer the weekly reflective journal questions that provided them with a private forum to tell me their learning preferences, their personal learning struggles, and a safe place to inform me of the factors in their lives that were impeding their learning. They were required to write a minimum of one sentence for each question and some students wrote as much as one full page responses. I anticipated students not wanting to take time away from their assignments to write long responses so I was pleased with the extensive responses. As the study progressed students wrote increasingly more meaningful comments regarding their learning needs, and provided useful suggestions for me to modify my teaching practices. I began to feel more in tune with their learning needs thus was more able to be more sensitive in making accommodations for them. Students stated that they appreciated the opportunity to make choices in the classes, such as which types of activities we would do, and provide feedback to me about teaching practices I was implementing. They expressed that they felt that I listened to them and noticed that I tried to alter my teaching to increase their learning.

In the future I will continue to provide students with the opportunity to journal reflectively about their learning needs. Students are often cautious to comment verbally and may be more comfortable writing down their feelings and suggestions. Providing

guiding questions helps students to clearly identify what they are responsible to change and what a teacher can modify to increase their learning.

Writing a statement at the end of each class period regarding new learning led to students reviewing the lesson objectives. Only one or two sentences were requested, however, some students seemed to rush through this task. Students did not express frustration verbally with the daily comments but their body language and facial expressions indicated that some of them became slightly annoyed with completing the task. Interestingly, several students asked if the class could continue writing their daily learning throughout the semester. They argued that writing down the key concepts learned each day kept them focused on the most important concepts they were to master. One student expressed that she felt her grade declined when we stopped the daily writing because she became less focused. In future implementations I would emphasize more strongly to students the importance of writing down new learning each day and I would move the activity to ten minutes before the end of the class period. Students were given only five minutes to change classes and the students that smoke found they needed more time to go outside and smoke before going to their next class. These students were primarily the ones rushing through their writing and the end of the class period so they would have more time between classes.

I found the implementation period of five weeks tiring yet rewarding. In the future I would implement fewer changes at one time. The most difficult aspect was to be faithful in writing the learning objectives on the board each class period. I found this particular task overly time consuming as sometimes a single lesson included four objectives. There were some days that I felt overwhelmed with the responsibilities of my teaching,

implementation of the study, and crises that were occurring in my personal life. During the first three weeks of implementation the objectives were written consistently, but in the last two weeks I was negligent and did not find the time a few classes each week. A benefit of writing the daily objectives on the board was that it kept me focused on precisely what I was trying to accomplish in each class period and students were clear regarding what they were expected to learn.

The examination of pretest and posttest marks proved to be very rewarding for the students. Nearly all were excited to witness the clear evidence that they were learning science. I rarely used pretests in the past and now see much greater value in them.

I was surprised by the students' response to the activities. They requested hands on activities but I soon discovered that they meant highly structured activities. Students visibly experienced, and verbally expressed, discomfort and uneasiness when they were expected to experiment without well-defined procedures. Students were afraid of making mistakes and felt overwhelmed without clear guidelines regarding activity procedures. This is not surprising considering that many of these students have been out of formal high school for many years. One of the primary modifications that I was asked by my students to make in the way I was teaching regarded the level of structure that I provided in the activities. When I significantly increased the level of structure I provided for activities, and described assignments in a more thorough manner, the students were quick to voice their appreciation and approval. In the future I will need to make a gradual transition from highly structured towards less structured activities.

An unwritten objective was to increase students' sense of responsibility for their learning. I printed assignment sheets for all the students and asked them to check off each

assignment as it was handed in then to record their mark when the assignment was returned to them. Monitoring one's own progress is an important skill that I continually reinforced. The reflective journal questions also addressed the students' responsibility for their learning. The weekly journals showed that students accepted full responsibility for absences and missed assignments. I expected some students to make excuses and rationalize missed work but the students clearly identified their responsibility. I emphasized to students that they were expected to play an active role in their education. They were responsible to ask for clarification when they did not understand, and for additional explanations if necessary. Many students expressed that they were afraid to ask for assistance regularly because in the past they were made to feel "bothersome" to the teacher, and were fearful of others discovering their ignorance which would lead to embarrassment and humiliation (Akey, 2006). I continually reassured them that it was their job as a student to take appropriate measures to ensure that they received the help that they needed, and it was my job as a teacher to provide that assistance repeatedly and patiently in such a manner that they did not feel bothersome. I encouraged a classroom culture that valued hard work and sustained effort, and reinforced that ability is not a fixed entity rather it can be incrementally increased (Ommundsen, Haugen, and Lund, 2005).

Focusing on appreciative inquiry, only positive comments, in the classroom helped my attitude remain positive along with the students. My classroom was a comfortable space for all students to work in. Students frequently came into my classroom to work in their spare time.

I was disappointed with the results of the surveys. The results did not seem to show any significant overall increase in student efficacy. I expect that the lack of apparent improvement occurred due to the heavy emphasis placed on the students to take full responsibility for their learning, in addition to the short implementation period. The reflective journals provided the most valuable information collected. In the journals, students clearly indicated that they were more confident in their learning as the study progressed.

There were several limiting factors that hindered the achievement of my goal of increasing academic self-concept, engagement and achievement in science of the adult First Nation students. A variety of social problems led to poor attendance, missed assignments, and discouragement for some students. These negative factors can lead to reduced competence beliefs and insufficient effort on the part of students to complete assignments, or the delaying or avoiding of assignments (Margolis & McCabe, 2004; Seo, 2008). Lack of computer access and low computer literacy of some students interfered with some of the assigned work involving applets, simulations, and animations. I am certain that the study would have benefitted from more collaboration and feedback from other teachers.

Discussion

Overall I am pleased with the results of the implementation of my action research project and consider it a success. I am disappointed that the survey did not provide more meaningful data; however, I am unexpectedly surprised by the quality comments and

suggestions made by students in their reflective journal questions. The student reflections clearly indicate that students were engaged in their learning and were aware of their learning needs. Regarding academic self-concept in science, the journals showed that students were generally confident in their ability to learn and expressed desire to learn. Unfortunately many personal situations impaired students' ability to be as successful as they knew they were capable. Academic achievement increased during implementation of the project indicating that the teaching strategies I was using, along with modifying instruction according to student needs were successful.

There are many positive strategies for teachers to integrate into teaching First Nations students that will develop more positive academic self-concept, increased engagement and increased academic success. Some include:

1. Requiring students to briefly record in a journal something new they learned or something at which they excelled each day;
2. Requiring students to journal reflectively about their experiences and feelings weekly. Initially using guided free writing then progressing to structured writing;
3. Explicitly teaching students to attribute their successes to a combination of ability and effort, and their failures to lack of effort or to confusion or reliance on inappropriate strategies;
4. Visually displaying the lesson objectives at the beginning of a class then explicitly showing students how they achieved those objectives at the end of the lesson;
5. Linking new work to prior experience in a more explicit manner. This may involve an extensive review of previous concepts for students with poor attendance; and

6. Increasing the level of demand by raising expectations of student achievement and assignment completion.

It is important to continue working at increasing the academic self-concept of adult First Nations students because competence beliefs can be increased at any point in a student's education (Akey, 2006), and have been shown to significantly affect student engagement and achievement (Hudley, Daoud, Polanco, Wright-Castro, & Hershberg, 2003; Akey, 2006).

In the future I would focus on implementing fewer changes and collecting fewer types of data. More collaboration from other instructors would also be sought in future action research projects as it maximizes impact and professional learning.

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Appendix A

Science Motivation Questionnaire

Name:

In order to better understand what you think and feel about your college science courses, please respond to each of the following statements by circling your choice from the perspective of: “When I am in a college science course ...”

01. I enjoy learning the science.

Never Rarely Sometimes Usually Always

02. The science I learn relates to my personal goals.

Never Rarely Sometimes Usually Always

03. I like to do better than the other students on the science tests.

Never Rarely Sometimes Usually Always

04. I am nervous about how I will do on the science tests.

Never Rarely Sometimes Usually Always

05. If I am having trouble learning the science, I try to figure out why.

Never Rarely Sometimes Usually Always

06. I become anxious when it is time to take a science test.

Never Rarely Sometimes Usually Always

07. Earning a good science grade is important to me.

Never Rarely Sometimes Usually Always

08. I put enough effort into learning the science.

Never Rarely Sometimes Usually Always

09. I use strategies that ensure I learn the science well.

Never Rarely Sometimes Usually Always

10. I think about how learning the science can help me get a good job.

Never Rarely Sometimes Usually Always

11. I think about how the science I learn will be helpful to me.

Never Rarely Sometimes Usually Always

12. I expect to do as well as or better than other students in the science course.

Never Rarely Sometimes Usually Always

13. I worry about failing the science tests.

Never Rarely Sometimes Usually Always

14. I am concerned that the other students are better in science.

Never Rarely Sometimes Usually Always

15. I think about how my science grade will affect my overall grade point average.

Never Rarely Sometimes Usually Always

16. The science I learn is more important to me than the grade I receive.

Never Rarely Sometimes Usually Always

17. I think about how learning the science can help my career.

Never Rarely Sometimes Usually Always

18. I hate taking the science tests.

Never Rarely Sometimes Usually Always

19. I think about how I will use the science I learn.

Never Rarely Sometimes Usually Always

20. It is my fault, if I do not understand the science.

Never Rarely Sometimes Usually Always

21. I am confident I will do well on the science labs and projects.

Never Rarely Sometimes Usually Always

22. I find learning the science interesting.

Never Rarely Sometimes Usually Always

23. The science I learn is relevant to my life.

Never Rarely Sometimes Usually Always

24. I believe I can master the knowledge and skills in the science course.

Never Rarely Sometimes Usually Always

25. The science I learn has practical value for me.

Never Rarely Sometimes Usually Always

26. I prepare well for the science tests and labs.

Never Rarely Sometimes Usually Always

27. I like science that challenges me.

Never Rarely Sometimes Usually Always

28. I am confident I will do well on the science tests.

Never Rarely Sometimes Usually Always

29. I believe I can earn a grade of “A” in the science course.

Never Rarely Sometimes Usually Always

30. Understanding the science gives me a sense of accomplishment.

Never Rarely Sometimes Usually Always

Taken from:

Glynn, S., Taasobshirazi, G., & Brickman, P. (2007). Nonscience majors learning science: A theoretical model of motivation. *Journal of Research in Science Teaching*, 44(8), 1088-1107. doi: 10.1002/tea.20181

Appendix B

Weekly Student Journal Entries

Journal questions to guide reflection that may be used to monitor student learning, attitudes, communication skills, and writing skills:

1. What are previous reasons for lack of attendance and/or lack of completion of courses?
2. What are your feelings about learning science?
3. What are your thoughts regarding your ability to learn science
4. How do you feel about the work you have been doing in science?
5. What do you suggest that the teacher keeps the same?
6. What do you suggest that the teacher changes or does differently?
7. Compare your pretest and posttest marks. Do you feel that you know and/or understand more about science now that the first chapter is over?
- 8A. Do you feel good about your marks in science so far?
- 8B. If not what can *you* do to increase it?
- 8C. If not what can *I* do to increase them?
9. How do you feel at this point about your learning in science?
10. Do you feel anything is interfering with you learning science? Explain.
11. What would help you to learn science more effectively?
12. Compare your pretest and posttest marks. How do you feel about the amount your grade increased?
13. Are you doing a reasonable amount of work?
14. Are you asking questions when you do not understand?

15. Do you like having the opportunity to comment on the way you are learning, the way the class is taught, and/or suggestions to help you learn? Explain.

16. Do you feel that your teacher tried to implement any changes that you suggested?

17. What do you feel your teacher needs to do more or less of to help you learn science more effectively?

Appendix C

Teacher Journal Entries

Journal questions to guide reflection before, during, and after each unit of study:

- What is the ideal situation – the situation which I want to bring about?
- What have I done?
 - What was I thinking?
 - How did I feel?
 - What was the context?
- What directions of student learning are happening?
 - What do I see happening?
 - What did the students do?
 - What do students say about what I am doing?
 - What did the students want?
 - What do students suggest that I change?
 - What were the students thinking?
 - How did the students feel?
- What do colleagues see happening?
 - What do colleagues suggest?
- What can I learn from that?
- What is value added?
- What are the limiting factors preventing the achievement of my ideal?
- What will I do next?

Appendix D

Pretest and Posttest Marks

Student Number	Chapter 1		Chapter 2		Chapter 3	
	Pre	Post	Pre	Post	Pre	Post
11	9	41	14	45	71	60
12	82	103	36	105	71	100
14	27	78	29	53	57	60
15	18	62	36	35	43	95
16	23	73	21	60	43	80
17	14	50	0	50	14	70
18	18	70	21	55	29	75
31	28	69	36	53	31	54
32	39	72	36	60	38	74
33	28	81	50	67	38	80
34	50	103	43	83	46	91
35	28	92	64	83	54	86
36	61	78	57	63	15	63
37	33	78	50	83	38	83
51	70	58	15	91	55	93
54	50	60	15	80	45	80
55	40	75	23	74	18	93
56	40	45	8	54	27	57
57	40	105	15	86	36	96
58	60	88	15	89	27	89
59	60	63	23	69	45	91
60	40	73	23	69	91	91
61	40	80	15	91	91	80
62	50	95	23	94	45	100

69 of 72 test marks, 96%, increased from pretest to posttest.

16 of 24 students test scores, 67%, increased from the chapter one to the chapter three tests.

Appendix E

Sub-Survey Scores from Second Survey – prior to chapter one test

Student Number	intrinsic	extrinsic	relevance	responsibility	confidence	anxiety
11	16	17	15	12	12	9
12	22	21	21	18	20	13
14	21	22	21	17	19	14
15	17	20	13	16	13	10
16	19	22	25	14	14	12
17	19	22	20	16	16	10
18	14	22	17	19	17	9
31	15	17	20	10	12	14
32	20	20	20	20	19	12
33	13	18	12	15	14	8
34	25	22	25	24	25	25
35	22	25	23	21	23	21
36	19	17	20	14	12	11
37	19	22	20	16	16	10
51	19	20	18	12	17	8
54	21	20	20	15	21	15
55	22	18	18	20	16	15
56	15	13	14	16	15	14
57	21	21	19	17	20	14
58	14	20	15	14	11	11
59	22	21	15	23	19	8
60	19	18	17	19	16	15
61	19	16	14	16	16	17
62	21	23	22	19	18	17
Group Mean	18.92	19.88	18.50	16.79	16.71	13.00
Chem. Mean	18.29	20.86	18.86	16.00	15.86	11.00
Bio. Mean	19.00	20.14	20.00	17.14	17.29	14.43
Sci. 14 Mean	19.30	19.00	17.20	17.10	16.90	13.40

Appendix F

Sub-Survey Scores from Fourth Survey – prior to chapter three test

Student Number	intrinsic	extrinsic	relevance	responsibility	confidence	anxiety
11	16	20	17	15	18	10
12	23	20	19	19	19	17
14	18	23	21	17	18	15
15	17	23	21	22	17	13
16	19	17	22	16	13	13
17	16	18	19	15	15	12
18	15	22	18	16	16	12
31	12	12	15	11	13	19
32	19	20	21	20	19	13
33	15	17	12	15	15	12
34	25	17	25	22	24	24
35	19	25	22	18	20	20
36	21	19	23	21	19	13
37	16	18	17	15	16	13
51	18	24	22	21	16	8
54	14	16	17	15	16	17
55	20	15	19	20	15	12
56	14	15	16	16	15	13
57	20	18	16	19	18	17
58	19	16	13	16	14	13
59	21	21	13	21	19	8
60	20	19	18	21	19	13
61	20	23	23	22	21	10
62	19	20	19	19	17	13
Group Mean	18.17	19.08	18.58	18.00	17.17	13.75
% change - 3.0		-3.2	+0.3	+4.8	+1.8	+3.0
Chem. Mean	17.71	20.43	19.57	17.14	16.57	13.14
%diff.	-2.3	-1.7	+2.8	+4.6	+2.8	+8.6
Bio. Mean	18.14	18.29	19.00	17.43	18.00	16.29
%diff.	-3.4	-7.4	-2.8	+1.2	+2.8	+7.4
Sci. 14 Mean	18.50	18.70	17.60	19.00	17.00	12.40
%diff.	-3.2	-1.2	+1.6	+7.6	+0.4	-4.0

Appendix G

Attendance Data

Chemistry 20: First period of the day.

Chapter one (add/drop week)	14 absences	22%	2 late	3%
Chapter two	10 absences	18%	2 late	4%
Chapter three	10 absences	18 %	8 late	14%

Biology 20: Period following the lunch break.

Chapter one (add/drop week)	10 absences	14%	0 late	0%
Chapter two	8 absences	16%	3 late	6%
Chapter three	7 absences	14%	6 late	12%

Science 14: Last period of the day.

Chapter one (add/drop week)	22 absences	24%	0 late	0%
Chapter two	18 absences	30%	0 late	0%
Chapter three	23 absences	26%	2 late	2%

Appendix H

Assignment Completion Data

	Late Assignments	Corrected and Resubmitted
Chemistry 20		
Chapter one	8	0
Chapter two	19	4
Chapter three	6	2
Biology 30		
Chapter one	11	0
Chapter two	41	14
Chapter three	41	8
Science 14		
Chapter one	27	0
Chapter two	57	11
Chapter three	33	6
Total		
Chapter one	46/386 12%	0
Chapter two	117/356 33%	29/356 8%
Chapter three	80/345 23%	16/345 5%