

8

Exploring the Influence of School and Community Relationships on the Performance of Aboriginal Students in British Columbia Public Schools

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Introduction

In the province of British Columbia, only 49% of Aboriginal¹ students, in contrast to 83% of all British Columbia students, complete high school² (British Columbia Ministry of Education 2008). Remedial efforts by educators, the provincial government, and leaders of First Nations communities are focused on academic performance and school retention of Aboriginal students. At this time, there is cause for some guarded optimism. The *How Are We Doing? Demographics and Performance of Aboriginal Students in BC Public Schools* series indicates that over a nine-year period, the Aboriginal school completion rate has increased from 37% in the 1998/99 to a high of approximately 50% in the 2004/05 and 2005/06 school years. In contrast, the increase for non-Aboriginal students has been more modest (from 76% in the 1998/99 year to the most recent 83% rate). Over this same time the BC Ministry of Education reports Aboriginal participation and performance rates in grades 4, 7 and 10 for reading, writing, and numeracy components of the Foundation Skills Assessment (FSA)—a standardized test administered province-wide—have improved.

The Aboriginal Education Enhancement branch of the BC Ministry of Education articulates policies regarding the education of Aboriginal students. In recent years the Ministry of Education has been pursuing formal Enhancement Agreements (EAs), or partnerships, with First Nations people province-wide. EAs now exist between thirty-six school boards and Aboriginal communities, and they are being negotiated in most of the other twenty-two school districts. The goals of the EAs are to improve the relationships between Aboriginal communities and schools and to improve academic achievement and graduation rates of Aboriginal students. The guiding policies behind these agreements make evident a desire to improve the climate of schools for Aboriginal parents and students by sharing decision making and establishing cultural and language programs. As well, the EAs set the

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expectation that there will be close monitoring of the performance of Aboriginal students with the intent to use these data to set local school and school-district goals for continuous improvement. FSA results and the school completion rates are two of the key indicators used to determine whether Aboriginal students have advanced educationally (see Chapter 7 for a discussion of standardized testing).

It is not clear how well these district-level initiatives are presently working across the radically different school and community contexts that exist across British Columbia. Nor are the lessons one can draw from the successes of Aboriginal students explicit. There remains a challenge to understand whether general improvement has occurred, whether or not the gap between Aboriginal students and their non-Aboriginal peers has decreased over time, and most importantly, what factors facilitate or impede the educational progress of Aboriginal students.

Recent literature devoted to Aboriginal education has focused on a narrow set of variables in accounting for Aboriginal students' poor school outcomes and for schools' poor performance with Aboriginal students. This study begins with an understanding that there are variables that have not been addressed that might be helpful in explaining the gap between Aboriginal and non-Aboriginal students in British Columbia. Those variables may include the relative proportions of Aboriginal and non-Aboriginal students in the school, the proportion of on-reserve or off-reserve Aboriginal students in the school, the size of the community in which the school is located, the socio-economic conditions of the community, and the interrelationships of these variables. We wish to contextualize the BC Ministry of Education school performance data utilizing these variables in order to explore their relationship to Aboriginal school completion rates.

Overview of the Chapter

There are six sections to this chapter. First, there is a review of literature related to factors that may be associated with school attainment of Aboriginal students, Kindergarten to Grade 12 (K–12). Second, there is a brief description of the context of Aboriginal education in the province of British Columbia. Third, there is an overview of research methods and data issues. Fourth, there is a presentation of descriptive findings related to disparities between the Aboriginal student group and the non-Aboriginal student group across the province. Fifth, the results of our HLM analysis are presented, modeling how school demographics, as well as the economic and health profiles of communities in which schools are situated, influence the completion rates of Aboriginal students. The modeling results reinforce the descriptive findings regarding the relationship between lower socio-economic conditions, student mobility, and Aboriginal school completion. Finally, in the sixth section, policy implications are outlined. We point out the importance of taking student-level characteristics, such as student mobility, into consideration when making comparisons between school-level results and when making public policy.

Section One: School Attainment and Aboriginal Students

While much research has investigated broad issues of school completion (also referred to in the research literature as graduation, attainment, attrition, and dropout) for K–12 students, a limited number of studies have been conducted that seek to identify determinants of school attainment of Aboriginal students. This is a brief summary of research in this area, where a variety of approaches and perspectives are evident. These studies provide valuable insights to both individual experiences and larger school and societal issues that may influence school completion of Aboriginal students. The studies represent varied approaches and diverge both from each other and from the large scale analysis of school records done for this chapter. Cumulatively, this body of work contributes to an emerging and provocative body of work focused on Aboriginal schooling.

Individual Aboriginal Students: What Makes the Difference in K–12 School Completion?

Researchers have explored the cases of individuals through surveys and interviews in order to understand the experiences of individuals with school systems and have sought to uncover factors that may assist or act as barriers for Aboriginal students. Studies may also attempt to uncover factors that differentiate Aboriginal students who complete high school from those who do not. For example, in British Columbia, van der Woerd and Cox (2003) link student health-related characteristics such drug and alcohol addiction with school “at risk” status for Aboriginal students in Alert Bay, British Columbia. In another British Columbia example, Aboriginal students self-report that literacy skills are a barrier (First Nations Education Council 1997). Bazylak (2002) stresses the prominence of issues such as family, personal supports, as well as self-identity, that are evident through the narrative accounts of successful female Aboriginal students in Saskatoon, Saskatchewan. Kanu (2002) identifies the use of culturally appropriate learning styles in classrooms and supportive classroom environments as prominent themes in a Manitoban study.

A similar line of inquiry appears in US studies investigating the low high school completion of Native American students. Bowker (1992) interviewed Native women in three US states and noted that pregnancy and uncaring teachers were factors identified by Native women who did not complete school in her sample, while personal support was a factor for students who did complete school. Similarly, uncaring teachers (negative) and lack of parental support are factors identified by those who did not complete school in Coladarci’s study (1983). In a case study of three Native students in an urban alternative school presented by Jeffries, Nix, & Singer (2002), students indicated that the impersonality of large schools and teachers created a sense of disconnection to school. Other American studies of Native American students examine self-perception related to academic

performance (House 2003) and family connectedness (Machamer & Gruber 1998). This research contributes depth at understanding individual-level experiences of school completion and complements individual-level factors identified in the school attrition literature of other student groups, albeit leaving broad school differences and socio-economic and community differences unexplored.

School Structure Issues and Aboriginal Students

There are several studies on the effects of school organization factors and K–12 school completion (Bryk & Thum 1989, Lee, Bryk & Smith 1993, Reihl 1999, Rumberger 1995, and Wehlage & Rutter 1987). McLaren (1980) notes that personal problems of students such as access and transportation issues, pregnancy, and the need to provide care for family members, simply are not accommodated by most schools. Such perspective encourages us to consider whether students actually independently drop out of school or if they are “pushed” out by systemic and school-structure factors. In contrast to identifying student factors associated with poor or successful educational outcomes, some researchers examine how the structures and dynamics of school institutions create challenges and problems for some students or some student groups in particular. Fine (1986, 1991) discusses how schools discourage and exclude certain minority groups and poor students from full participation. Based on ethnographic work, Dehyle (1989, 1992, 1995) details how Native students are systemically marginalized at the schools they attend. Levin (1992), in an examination of curriculum, argues that existing school structures actively create dropouts and that program changes would benefit Aboriginal students and others. In a review of school-based causes and solutions to school drop out of Native students in the US, Reyhner (1992) urges change in the practices of teachers, counselors, and school administrators. They call for large impersonal schools to restructure, schedule longer class blocks, and resist testing regimes that result in student grade retention. While this work begins to address school-level interventions, empirical research that identifies or measures the effects of specific school structures or school practices has yet to occur.

Schools and Larger Social Issues for Aboriginal Students

Many scholars concerned with inequity of performance among student groups look at the dynamics of racism, forced assimilation, problems with integration, and segregation of minority groups in the school context. Some minority groups, it is argued, resist school as an institution in order to maintain their own unique cultural identities (LeCompte 1987). This is a provocative theoretical lens and is helpful in understanding how student group membership might influence individuals. Ogbu (1992) presents the different political relationships minority groups have to the dominant political structure as an explanation of educational attainment differences in minority groups. In his typology, Aboriginal students occupy an “involuntary minority” status and are disadvantaged by a politically entrenched exclusion. Cummins (1997) has used Ogbu’s framework in discussing Aborigi-

nal students and current and historical power relations in the Canadian context. However, Marker (2000) notes that Aboriginal groups are very distinct from other visible minorities. As descendents of the first people, they have a profoundly different relationship to local place, as well as different historical and economic relationships to non-Aboriginal settlers. Marker also argues these distinctions regarding Aboriginal people are ignored or poorly understood by educators and education policy makers.

Schools and Aboriginal Culture

There is a substantial body of work that posits that experiences in public schools create cultural discontinuity for Aboriginal students. Many scholars and advocates for improved Aboriginal school performance argue that the aspirations, learning styles, discourses and value systems, worldviews, and histories of Aboriginal cultures are devalued in schools or eradicated by colonialist agendas (Chisholm 1994, Hampton & Roy 2002, Kanu 2002, Perley 1993, Robertson 2003, Stairs 1995, Wall & Madak 1991). Schools are discussed as negative and destructive locations for Aboriginal students. Yet, for some researchers, the relationship of identity and school is not necessarily so direct; the strength of cultural identity developed within individual Aboriginal students may support (rather than hinder) their academic performance in public schools (Brade, Duncan, and Sokal 2003, Dehyle 1992).

There are numerous calls for schools to support and enhance the cultural strength of Aboriginal students (e.g., Archibald 1995) and many Aboriginal people urge a deep and meaningful integration of Aboriginal cultures into school cultures. For example, teachers should explicitly utilize the worldviews of Aboriginal peoples as a teaching strategy (MacIvor 1995, Smith 1999, Stairs 1995). Calls have been made for anti-racist curriculum, culturally relevant curriculum, and Aboriginal language courses (e.g., see, Calliou 1995, Labercane & McEachern 1995, Leavitt 1995, Sterling 1995, Vallerand & Menard 1984). There is also a strong call from many Aboriginal educators and researchers that Aboriginal people should have jurisdiction over their own education systems to insure strong cultural ties and healthy identities (Hookimaw-Witt 1998, Kirkness 1998, Siggner 1986, Tsuji 2000). As with school-level interventions suggested by the previously mentioned literature, the impact of these changes are not easily determined empirically. Future research will have to look at these measurement problems in order to verify the proposals.

Student Outcomes and Schools in Broader Socio-economic Context

Following the seminal Coleman Report in the US (Coleman et al. 1966), researchers have attempted to determine and account for differences in school achievement of student populations by collecting and evaluating data pertaining to students, school structures, and social and economic conditions of locations. Conducting

such large-scale comparative studies of schools is difficult for methodological, logistical, and financial reasons. Such studies are data-driven, and it is difficult to secure measures that mean the same thing across different contexts. The data are multi-level (student, school, family, community, district, state/province) and there are few models of how interrelationships occur (Rumberger & Thomas 2000). Another issue is the lack of common understandings and utilization of concepts. For example, when school completion (or student dropout) is a school outcome of interest, the lack of standard definitions of these terms problematicizes analyses, since difference in students outcomes become confounded with differences in definition of terminology (LeCompte and Goebel 1987, Rumberger 1987).

Research focused on understanding Aboriginal school outcomes, such as school completion, does not escape these methodological challenges. MacKay and Myles (1995) note in their survey on the causes of Aboriginal student dropout that locating even basic statistical data is “surprisingly difficult” (1995,158). Swisher et al. (1991) and Swisher and Hoisch (1992) describe the difficulty in reaching meaningful conclusions, given that existing studies are localized, dispersed across multiple school systems, and utilize multiple ways of calculating attrition rates. Brady (1996) notes that federal data pertaining to Native peoples are difficult to obtain, and there are additional difficulties posed to researchers by shifting definitions of peoples such as Status Indian, non-Status Indian, Inuit and Métis. Data are also complicated by issues of identity, both given and chosen, as Guimond (2003) has indicated. Ledlow (1992), who evaluates the research of dropout and American Indians in terms of cultural discontinuity studies versus ecological or “macro level” explanations, notes similar difficulties created where school attendance, attrition, or completion are not systematically measured in the same way across jurisdictions.

However, a few small-scale studies have been attempted that examine socio-economic factors and school structural factors in terms of Aboriginal students. Cameron (1990) has connected school performance data of secondary schools with school demographic data to examine Aboriginal school attainment in British Columbia. In the United States, Ward (1995, 1998) explores the interactions of schools and communities with Indian students in rural settings, and compares school context and cultural differences of Native communities in another rural setting. She observes how effects of multi-level factors vary by school.

Situating this Study

While the literature on factors that may be associated with school attainment of Aboriginal students informs this research presented in this chapter, the focus here was on examining available administrative data in terms of demographic characteristics of students, schools, and the broader socio-economic conditions of communities. Our objective in this study was to explore variables that could be derived from a very large sample of students (all students enrolled in the British Columbia public school system over thirteen years) in addition to community socio-

economic measures. An in-depth analysis of school record data would contribute significantly to the quantitative evidence explaining the school completion differences between Aboriginal and non-Aboriginal students in British Columbia. The scope and comprehensive nature of the data created an unparalleled opportunity to examine this issue across an entire provincial student population.

The variables initially explored include the relative proportions of Aboriginal and non-Aboriginal students in the school, the proportion of on-reserve (Status) or off-reserve (non-Status) Aboriginal students in the school, the size of the school, the size of the community in which the school is located, the socio-economic conditions of the community, as well as the relationships among these variables. An objective was to contextualize school performance data derived from the individual student school histories in order to uncover patterns that may exist across diverse school locations and explore their influence on the school completion rates of Aboriginal students.

Section Two: The Context of Aboriginal Education in British Columbia

This is a brief description of the education governance structure, school accountability initiatives and the school/community context of Aboriginal students living in the province of British Columbia.

In the province of British Columbia, the provincial Ministry of Education is responsible for the education of K–12 students. However, the federal government of Canada, and more specifically its Department of Indian and Northern Affairs (INAC), currently has jurisdiction over the education of Aboriginal students living on-reserve and attending band-operated schools nation-wide.³ Band-operated schools are attended by less than 10% of K–12 Aboriginal students in the province of British Columbia (Postl 2005). The large majority of Aboriginal students in British Columbia are enrolled in provincially operated public schools. As of the 2006 academic year, approximately 565,500 students attend public schools in British Columbia; 55,000 (nearly 10% of the total public school student population) of these students self-identify as Aboriginal. In this research, the outcomes of Aboriginal students enrolled in British Columbia public schools are the focus, rather than a comparison of school completion rates in the two different schooling systems. The school outcomes of Aboriginal students attending Band-operated schools is not examined. Studies of band schools are hampered by the lack of consistent data.

In the province of British Columbia, data associated with performance monitoring have been available and published at the school, school district, and province-wide level for seven years, with the objective of serving school accountability and public transparency agendas. British Columbia is unique in Canada in that data associated with the Aboriginal student population are reported at the school, school district and province-wide level. (Other student groups for which results

are available at these levels are male, female, English as a second language, French immersion, special education and gifted.) While this reported information appears to convey trends in improvement over time for this student group (at least at the provincial level), it also invites superficial and misleading comparisons between student populations, schools, and school districts from year to year. The public information establishes mainly that (a) Aboriginal students typically have lower achievement than their non-Aboriginal peers; and (b) there is wide variation across the province, and within school districts. For example, to illustrate the degree of variation that exists, Vancouver School District (a very large urban school district) reports Aboriginal school completion rates that range from 14% to 31% across schools over the five school years reported.⁴ In this particular district, 3% of students identify as Aboriginal. In contrast, another district in central British Columbia with 14% of the students self-identifying as Aboriginal reports Aboriginal completion rates that range from 40% to 54%⁵ over the same period. The factors that influence this variation in performance have not been identified.

Extensive differences exist in the geographic, community, and school contexts of high schools and school districts across British Columbia. Many schools are located in large urban centres in the Lower Mainland of British Columbia. Others are located in northern or otherwise remote areas of the province. The neighbourhoods where the schools are situated vary widely in terms of social, educational, and economic conditions. There are smaller schools with just over 100 high school students enrolled and large schools where several thousand attend. Unemployment rates vary in the locations of these schools from 25% to 4%. Some schools are 8–12 schools; others are 11–12 schools. The proportion of Aboriginal students ranges from less than 5% to greater than 50%. Many major population centres across the province are large enough to have more than one high school where sizable populations of Aboriginal students are enrolled. Given the wide range of school contexts that exist and that these high schools are nested within a wide range of community contexts, the exercise of drawing comparisons between schools in order to identify patterns (and possibly exemplars) of Aboriginal school completion is intricate and imperfect.

Section Three: Data and Methodological Issues of this Study

The subjects of this study are each student enrolled in the provincial public school system in British Columbia throughout the school years 1991/92–2003/04. These are the earliest cohorts for whom data has been systematically collected and retained by the BC Ministry of Education. The main school outcome explored in this study is school completion of Aboriginal students. School completion is defined as grade 12 school completion within six years of beginning grade 8. There were over 1.5 million student records associated with enrolled students over this

time period available for analysis. The British Columbia Ministry of Education released this information for the purposes of this study and ensured that the identification of individual students was impossible through dummy encrypted personal identification codes. From these 1.5 million individual student-level records, eight cohorts of students starting grade 8 were constructed. In other words, all students who were enrolled in grade 8 for the first time in the provincial system were grouped together as a single cohort by school year. The cohorts ranged over time from the 1991/92 school year to the 1998/99 school year. Therefore, each student was assigned to a single cohort and was only counted as part of this cohort whether or not grade repetition or school-leaving occurred. Further, this study was able to disaggregate Aboriginal students into two Aboriginal subgroups (on-reserve and off-reserve Aboriginal students). The first objective was to examine school trajectories of cohorts progressing through the high school grade levels. The existence of several cohorts for study meant that recent cohorts could be also be compared to preceding cohorts in order to determine if changes, hopefully improvements, had occurred over time in basic school outcomes in the British Columbia public system.

From the school records, it could be calculated whether a student's school completion had occurred within six years of enrolling in grade 8 for the first time. In order to analyze patterns associated with students at the school level (such as demographic composition of the cohort), in addition to outcomes at the student level (such as high school completion), variables were aggregated to the school level in order to look at ecological relationships between schools. The aggregation was performed for each of the eight cohorts. Variables associated with school curriculum (such as Aboriginal support programs) or school district policies (such the district status regarding Aboriginal EAs), were not formally examined because policy and practices associated with these is subject to wide variation across school locations. Another limitation to analyzing such conditions is the paucity of consistent and comprehensive data associated with these characteristics. Thus, the only information used to characterize schools was based on aggregations of individual level student-records.

Data from the 2001 Census was utilized to describe the socio-economic context for each high school. These data were available for the two-mile radius surrounding each high school in the province. The socio-economic variables were (1) rate of educational attainment less than high school, (2) unemployment rate, (3) proportion of families earning under \$20,000 a year, and (4) average family income. These variables do not perfectly reflect conditions associated strictly to school catchment areas and particular demographic groups residing within the area, nor may they be accurate over the entire time period examined; however, as proxy socio-economic indicators, the information was drawn from the Census data was comprehensive and salient.

Over the reference period of this study (1991–2005), many schools opened, closed, changed their names, transformed their grade structures, or altered their

service delivery structure (to alternative programs or distance education, for example). In addition, the provincial education system underwent a process of school district amalgamation, during which many schools were reassigned to new school districts. These factors provided a caution in interpretation of some results: it cannot be assumed what was identified as a given “school” was stable.

A critical observation was that grade 8 cohorts at many schools did not remain stable in terms of student composition over time. Typically, differences analyses of schools in which students were enrolled *in their first (grade 8) year of high school* were conducted. However, analyses of relationships between school cohort composition and school outcomes associated with the schools students attended *in their fifth (grade 12) year of school* were also conducted. These analyses addressed the possible impact of changes in school structures that occurred in the six-year span in which students were completing high school, and the effects of student mobility and drop-out in those six years. The recognition that student demographics in schools change across and during school years allowed the pursuit of questions: In what way had the cohort composition changed due to student mobility or student attrition? How many new Aboriginal students had joined the original Aboriginal cohort? Had Aboriginal students moved to other schools in the community, the school district, or across the province?

The number of school changes that occurred at the student-level in the six-year time frame of high school was calculated. The school records allowed for further categorization of school changes as occurring within-district or between-districts.⁶ School change (student mobility) emerged as important variable at the student-level with respect to school completion for Aboriginal students.

As a cautionary note, it is not known to what degree data management practices, reporting practices, and graduation policies account for observed improved outcomes in the data over time. Therefore, dependable inferences regarding the causes of the improved outcomes cannot be based solely on these data. In response, there is a statistical control (by considering schools longitudinally) for the temporal variability in completion rates in the model described in Section Five of this chapter.

Section Four: Disparity and Variability of Aboriginal School Outcomes Across British Columbia

In this section, descriptive information regarding the variability and disparity of school completion rates and related school outcomes is presented. As previously public-domain school information indicated, there was a high degree of disparity and variability in the six-year school completion rate for Aboriginal students in public schools in British Columbia. Analysis of student grade trajectories confirms that numerous differences exist in school careers of Aboriginal students and non-Aboriginal students broadly, and at the majority of high schools province-wide.

Grade to Grade Progression and School Interruption

There are substantial differences in the percentage of students progressing from one grade level to the next as early as the transition from grade 8 to grade 9. For Aboriginal students, there is a 10% attrition rate (or rate of not progressing to the next grade) after each secondary grade level. In contrast, the rate in the non-Aboriginal student group is 2%. This finding is consistent with White et al. (2004), which found that there were higher levels of school leavers at the transition to grade 9 from grade 8. As well, there is a higher rate of absence from the school system over secondary grade levels associated with Aboriginal students. The data also show that 15% of Aboriginal students have left the BC school system for one or more years in their secondary trajectories, returning to the school system after this absence. This rate of school interruption is 2% in the non-Aboriginal students.

“Secondary Ungraded” Classification

Both schools and school districts vary in the rate of students classified as “secondary ungraded”—a school program categorization in which students are no longer in the regular graded program. In other words, secondary ungraded students are not considered to be in a program associated with a secondary grade level (grade 8, 9, 10, 11 or 12). Practices regarding which students are categorized in this manner and the individualized education programs they receive are at the discretion of the school districts. Aboriginal students are invariably categorized as secondary ungraded at higher rates than non-Aboriginal students. Province-wide, approximately 11% of Aboriginal students were categorized in this way (as opposed to fewer than 2% of non-Aboriginal students). The completion rate for Aboriginal students categorized as secondary ungraded is low (8%). Therefore on average more than 90% of those students in this category never complete.

Variability Associated with School Completion of Aboriginal Students

By the expected grade 12 year, a substantial proportion of Aboriginal students have left the school system altogether (13%), nearly three times the number of non-Aboriginal students leaving (5%). These students, by definition, do not complete school. Additionally, there is a high proportion of Aboriginal students in the school system that do not graduate within 6 years, though they are present in the school system. These school completion rates differed between on-reserve Status Indian (also referred to as band-status) students attending public schools and those who are non-Status (or non-band) Aboriginal students. As well, we saw improvements in the completion rates for both groups. School completion rates for Aboriginal students with band status increased from 24% to 31%, and non-band status Aboriginal school completion rates from 29% to 48% over the eight cohort years examined.⁷ Across the 103 high schools where Aboriginal cohorts were typically greater than eight students, Aboriginal school completion rates

ranged from 14% to 78%. (School completion rates of Aboriginal band students ranged from 0% to 67%.) Year-to-year Aboriginal school completion rates at each school also varied dramatically. To illustrate this, a school with a long-run “average” or typical completion rate might have rates ranging from 33% to 90% over eight years. Another school with a typical long-run average might have year-to-year rates ranging from 8% to 70%. The pattern of variability from year to year can be observed in nearly all high schools. Adding complexity, band student completion rates can vary considerably from non-band student rates within the same school and the same year. This within-school variability calls into question any inference that that continuous improvement is occurring broadly at a school and hence renders accountability-driven targets based on trends problematic.

School Mobility

Finally, there are observable differences in the completion rate of Aboriginal students who changed schools in the six-year window given for school completion. To illustrate, in one cohort (starting grade 8 in the 1998/99 school year), approximately one third of the Aboriginal students did not change schools. However, 57% of Aboriginal students who did not change schools completed school within six years. This is a much higher percentage than the overall 42% completion rate reported for Aboriginal students province-wide. An estimated 18% of the Aboriginal cohort changed schools once due to grade progression, such as in cases where students are enrolled at middle schools (grade 6–grade 8) or junior high schools (grade 8–grade 10). The completion rate of these students is comparable (at 58%) to Aboriginal students who had never changed schools. Approximately one third of the province’s 1998/99 Aboriginal cohort changed schools between districts. These Aboriginal students’ six-year completion rate is nearly identical to the completion rate of students who change schools within districts. Approximately 30% of these Aboriginal students complete school. There is one more categorization of school change—school change within a school district. An estimated 20% of the 1998/99 Aboriginal cohort experienced within-district school change. The completion rate of these students is substantially lower than that of their peers who remain in the district and do not change schools, or alternately change schools due to grade progression. Students who change schools within district in this cohort had a 28% completion rate. We therefore suggest that disruptive school change, or student mobility, is a significant factor in both student-level and school-level school completion for Aboriginal students. However, when school change is associated with grade progression and hence is experienced by all students in a given grade level, it does not appear to have the same negative impact on student outcomes.⁸

Section Five: Modeling the Interaction of School Context, Socio-economic Community Context and Aboriginal Cohort School Completion

As described above, for each high school, there were eight cohort years in which school-completion outcomes and student composition variables were constructed. Data was merged in order to identify schools by name and by location with the data provided by Statistics Canada regarding the socio-economic status of the population living within a two-mile radius of high schools according to six-digit postal code geography information. Using information on the student records, a multilevel database that nested students-within-cohorts and cohorts-within-schools was produced. Thus, for any particular school, this database could be used to estimate the long-run average completion rate for Aboriginal students, the completion rate for any given cohort, and whether or not any single student had completed in any given cohort. This data was used in the second stage of analysis to identify the contributions of different levels of context on Aboriginal student school completion.

In the second stage of analysis, the available demographic, school context, and community socio-economic variables were used to provide a sense of the relationships these could have with individual school completion of Aboriginal students. Implicitly, the collection of certain variables by the Ministry of Education suggests the hypothesis that these variables are related to the quality or equity of students' learning conditions and experiences. Nevertheless, these variables were used to test the general hypothesis that student characteristics, schools, and community influence school-completion of Aboriginal students. A multi-level analysis was conducted using the software HLM6 to estimate the relative influence of each of these contexts, as well as identify specific variables within each context that might explain its influence.

The process of modeling the relationships had four stages. The purpose of the first stage was to establish the baseline Aboriginal completion rate and partition the variance in completion between the three levels of analysis (student, year, and school). The purpose of the second stage was to identify student-level features which might explain some of the difference in probability of completion between Aboriginal and non-Aboriginal students. The purpose of the third stage was to identify year-specific school-level characteristics, such as student composition and school size, that explained variation in either average cohort completion rates or the difference in probability of graduating between Aboriginal and non-Aboriginal students in a particular cohort. The purpose of the final stage was to identify possible permanent school-context variables that might explain either the variation in school-cohort completion rates or persistent, cross-cohort differences in the probability of completion between Aboriginal and non-Aboriginal students in a school. Parsimony in building this statistical model is achieved by backward deletion.⁹

Table 8.1: Null Model of Non-Aboriginal, Aboriginal and Band-Status Student Likelihood of School Completion

	Probability of school completion	(s.e)	s.d. (across cohorts)	s.d. (across schools)
Non-Aboriginal status	0.73	(0.01)	0.04	0.15
Aboriginal status relative to non- Aboriginal status	-0.24	(0.01)	0.07	0.10
Band status relative to non- band status	-0.15	(0.01)	0.10	0.09

Null Model Results

The first model presented below (see **Table 8.1**) or null model, contains no variables that explain the outcomes of interest. In the null model, the outcome is simply whether or not a student has completed school. The predictor variables are whether a student has ever had Aboriginal status and whether a student has ever had band status. (All students with band status also have Aboriginal status.) In a sense, the null model attempts to explain how much of the variation in the dependent variable can be explained by simply the clustering within Level 2 (school) units. Intraclass coefficients describing the relative proportions of variance of the main effects (in the leftmost column of **Table 8.1**) at the cohort and school levels can be obtained by taking the ratio of the variances of the effects at these levels. The variances can be obtained by squaring the standard deviations presented in the two rightmost columns of **Table 8.1**.

Variation in school completion rates occurs primarily between schools, not between years. The estimate presented in the first row of **Table 8.1** indicates that the overall school completion rate of non-Aboriginal students is 0.73, indicating that just over seven in ten non-Aboriginal students are expected to graduate. From year to year, the standard deviation of this estimate was 0.04, suggesting that non-Aboriginal school completion rates were fairly consistent over time. In contrast, the standard deviation of this estimate across schools was 0.15, suggesting that cohorts within schools tend to be relatively consistent in school completion rates relative to the differences in school completion rates between schools.

On average, school completion rates of Aboriginal students tend to be lower (-0.24) than that of non-Aboriginal students. This standard deviation of this effect across cohorts is 0.07, suggesting that the effect of Aboriginal status on probability of school completion is relatively unstable across cohorts.¹⁰ The results for band-status students across cohorts are similar to those for Aboriginal students. Furthermore, since band students are a subset of Aboriginal students, the instability due to small within-cohort sample size is even greater than that of Aboriginal students generally in the student population. The ratio of the school-level

variance to cohort-level variances for school completion rates of non-Aboriginal students is 0.93, indicating that variation in school completion rates occurs primarily between schools, not between years. Similarly, the variability of the effect of Aboriginal status on school completion is greater across schools (s.d. = 0.10), than across years (s.d. = 0.07), although the ratio is much smaller (0.51). In contrast to the non-Aboriginal and Aboriginal student groups, the variability of the effect of band status on school completion rates between cohorts (0.10) and between schools (0.09) is almost the same, suggesting that the average effect of band status is equally unstable across cohorts and schools.

The main interpretation from these null model results is that the variability of school completion rates *across schools* is much greater than *over time* and both Aboriginal and band students appear to be at greater risk of non-completion than of their non-Aboriginal peers. Moreover, there are relatively large variations in effect of Aboriginal and band status indicators over cohorts and schools. Given that these effects are in reference to the non-Aboriginal group, these variations indicate that the school completion outcomes in Aboriginal students tend to be far more variable than for non-Aboriginal students at all levels of analysis.

Explanatory Model Results

The full model presented below (see **Table 8.2**) describes the final model that was fit to the data in this study. Variables from the original data are not presented here if their effect is insignificant in the context of the other variables in the model. One such insignificant variable (number of Aboriginal students in a school) was left in the model for illustrative purposes. The significant variables are (1) secondary ungraded status, (2) mobility across school districts status, (3) Aboriginal status, (4) the proportions of families living with low income within a two-mile school radius, (5) the proportion of Aboriginal students in school, and (6) band status.

The explanatory model suggests that expected school completion of non-Aboriginal students who have never had secondary ungraded status, who do not attend schools with Aboriginal classmates, and have no low-income families in their communities, in British Columbia high schools is 0.87. If students are Aboriginal, the expected school completion drops by 0.17 to approximately 0.70. If the Aboriginal student has band status, the expected school completion drops further to approximately 0.54.

This explanatory model provides information about patterns that are associated with the cohort composition and student group completion rates at the school level. High school cohorts where there are no Aboriginal students are expected to have a 0.87 school completion rate. Where school cohort compositions have increasing Aboriginal and band students, associated school completion rates decline by 0.04 for each incremental change of 10% in the school student population. However, this association cannot be interpreted as causal. It is much more likely to be indicative that high proportions of Aboriginal students are correlated with community conditions associated with poorer student outcomes for all students.

Table 8.2: Explanatory Model

Description of effect	Probability of school completion	s.d. (across years)	s.d. (across schools)
School completion rate of non-Aboriginal students in schools with no mobility and no Aboriginal students	0.87	0.04	0.10
The adjustment to the school completion rate for every 10% increase in the percentage of Aboriginal students in the school	-0.04	-	-
The adjustment for every additional Aboriginal student in the school	0.00	-	-
The adjustment based on if the student has ever been assigned to secondary ungraded status	-0.39	-	-
The adjustment based on if the student has changed school districts between grades 8 and 12	-0.16	-	-
The unexplained difference in school completion between Aboriginal and non-Aboriginal students	-0.17	0.07	0.08
The change in the Aboriginal school completion difference associated with every 10% increase in the number of families living in low income in the surrounding community	-0.05	-	-
The change in the Aboriginal school completion difference associated with every 10% increase in the percentage of Aboriginal students in the same school class	0.02	-	-
The unexplained additional difference in school completion associated with band status	-0.16	0.09	0.09
The adjustment in band-status school completion rate difference associated with a 10% increase in the proportion of the surrounding community who are Aboriginal	0.02	-	-

Note: Only individual main effects were specified as variables across years and schools.

The model indicates that Aboriginal school completion is diminished where there are higher proportions of low-income families in school neighbourhoods. Wherever there is a 10% increase of families living on low incomes in the school neighbourhood, school completion rates diminish by 0.05. In other words, Aboriginal students are not uniformly distributed across communities in British Columbia.

The model illustrates the effect of mobility on the expected school completion rate of student groups. Mobility that involves a change of school districts in high school grade levels diminishes the expected probability of school completion by 0.16.

Finally, a very interesting Aboriginal cohort effect emerges from the explanatory model. Results here indicate the hypothetical difference between probability of an Aboriginal student's completing school in two otherwise similar classes, one with no other Aboriginal students and one with all Aboriginal students, is 0.21 (The change in the Aboriginal school completion rate difference associated with every 10% increase in the percentage of Aboriginal students in the same school class is 0.02) However, higher proportions of Aboriginal students are linked to increases in Aboriginal school completion and Aboriginal band student school completion at the school level.¹¹ An interpretation of this finding could be that although Aboriginal students tend to live in less advantaged communities, the school completion difference compared to non-Aboriginal students appears to be ameliorated somewhat wherever there are increases in the proportion of their classmates who are also Aboriginal. In a similar way, where there is increasing Aboriginal representation in the community, there is a higher probability of graduating for band-status students.

The modeling confirms that in British Columbia public high schools there are significant differences in student populations in terms of school completion. This model confirms the hypothesis that student characteristics, schools, and community influence school completion of Aboriginal students. The results of the null model indicate that the 51% of the variation in Aboriginal school completion rate differences across different schools and cohorts can be attributed to school-level factors. With the simple model presented in this study, the residual standard deviation of the Aboriginal school completion rate difference at the school level in the explanatory model was 0.08, representing a 36% decrease in variance, explained primarily by the socio-economic context of schools. While not a complete explanation of the problem, this result is not trivial and highlights the influence of context in exacerbating inequities between individual students. The explanatory model confirms that factors associated with student populations (Aboriginal status, between-district mobility), and school communities (socio-economic conditions) explain some of the differences in school completion rates across British Columbia over the time period that was the focus of this study.

Section Six: Policy Implications

What conditions are associated with the smallest and greatest disparities between Aboriginal and non-Aboriginal students when system-wide administrative data is available for examination? This study demonstrates that school completion differences are generally greater in school contexts where less favourable socio-economic conditions prevail, and where the student composition includes band students and highly mobile Aboriginal (band and non-band) students.

For those educators, researchers, and policy-makers interested in addressing the equity issue of school outcomes of Aboriginal students, both an understanding of the socio-geographic pattern of inequities and an understanding of student

characteristics associated with vulnerability to poor school outcomes should be of more value than examining school-level performance rates. Comparisons of school rates of Aboriginal school completion or any other school-related measure by year or across schools can be very misleading because *fundamentally different populations of students may exist each year or in each school*. The study indicates that data must be analyzed in a manner that makes student demographic features evident before comparisons are made, particularly where comparisons are aimed at evaluation of school improvement or program success

It's hoped that studies of this kind can assist advocates, educators, and policy-makers to understand and consider some of the macro-level factors that may be related to school completion by Aboriginal students. Data related to school context and community context are valuable and should be systematically gathered and shared. Such data allows for insights regarding the system-wide variability in school performance and the influence of factors within and beyond the control of individual schools.

It is hoped the identification of mobility as a significant factor in the educational careers of Aboriginal students does not persuade school officials that the problem rests with the mobile students and their families or lead them to absolve schools of any responsibility. Quite the opposite, this observation should prompt schools to think differently about their responsibility to such students.¹²

The personnel, programs, policies, and practices at the school level may contribute significantly to the variability in Aboriginal school success. While this study is a large-scale quantitative analysis, more qualitative and ethnographic work located at schools would provide refined information on current school practices that promote school completion. The qualification, experience and attitudes of teachers may play a role. Further, instructional variables such as program design, lesson activities, curriculum, and classroom structure and climate might influence Aboriginal academic success. These might include funding and resource allocation, school structure, leadership style, disciplinary climate, and homework policies. Much of the qualitative work focusing on Aboriginal issues in education suggests the importance of these factors. At a higher level, community conditions, dynamics, and available support services should be examined using information more relevant to local contexts, rather than generic socio-economic descriptors. It is our hope that research focusing on Aboriginal school outcomes will continue in order to provide information that influences positive and appropriate responses within education systems.

Endnotes

- 1 In this paper the term Aboriginal refers to students who have self-identified as being of Aboriginal ancestry on the annual British Columbia Ministry of Education student data collection form (Form 1701). These students may include First Nations, Status Indians, non-Status Indians, Métis or Inuit. The authors recognize that the definition of these terms is contested. Students voluntarily declare themselves Aboriginal, but may choose not to do so consistently every year. For the purpose of this analysis, we considered students who had ever declared themselves to be Aboriginal on Form 1701.
- 2 In British Columbia, the Ministry of Education makes a distinction between the terms “graduation” and “six-year completion.” Graduation rates describe the proportion of students enrolled in Grade 12 in September who graduated in the same school year. In contrast, a six-year completion rate tracks the proportion of students who graduated within six years of starting Grade 8. In this paper, we use the term “school completion” in keeping with the Ministry of Education definition.
- 3 In this paper the term on-reserve student indicates a Status Indian student who is associated with a reserve or band. We use this term interchangeably with band student. These students are provided federal education funding whether they enroll in band schools or provincial public schools. For the purpose of this analysis, we considered students who had ever received federal funding as an On-Reserve student. It is important to note that in British Columbia, approximately 70% of K–12 students who identify as Aboriginal are not living as Status Indians and are not affiliated with a particular band. For these self-identified non-Status Aboriginal students, as well as for the band students attending a provincial public school, the province of British Columbia allocates an additional \$950.00 per student, per school year beyond the per-pupil allocation. This additional funding (\$45 million per, school year) is provided in order to address the inequity faced by Aboriginal students and is used to fund Aboriginal language and culture programs in the school system, Aboriginal academic support programs, and other localized Aboriginal programs. See www2.news.gov.bc.ca, “New Agreement to Help Aboriginal Students Succeed” regarding funding allocation.
- 4 See <www.bced.gov.bc.ca/reports/pdfs/sd_perf/039.pdf>
- 5 See <www.bced.gov.bc.ca/reports/pdfs/sd_perf/073.pdf>
- 6 It should be noted that students both changed high schools within their original district or within their destination district, and changed schools across districts during their high school grades. (For the purposes of this analysis, if a district change occurred between grade 8 and the fifth year of high school, the students were included in the between-district school change category.)
- 7 Editor’s note: While improvement in both categories varies between schools, and within schools, it is interesting to note that the non-band status group improved significantly more in most of the schools studied.
- 8 Editor’s Note: This could mean that the change in schools is not accompanied by a change in living residence. The shift therefore is not in neighbourhood, but just school of attendance. All students progressing would shift, so social capital built up in the cohort is not lost to either Aboriginal or non-Aboriginal students. See White et al. 2006.
- 9 At each stage, the model is specified using all predictors available at that level. Then, one-by-one, we remove variables with no statistically significant effects from the model. The remaining variables with non-zero effects are then each tested for stability by comparing the coefficients of the other variables with and without each variable included in the model. Variables whose coefficients are co-dependent (i.e., which have effects of equal magnitude but in opposite direction that only non-zero when both are included in the model) are removed from the model. When each step is finalized, the model specification is fixed at that level and the same process is repeated for modeling the next level of data.
- 10 We suspect that the smaller numbers of Aboriginal students in each school relative to non-Aboriginals make the year-to-year estimates more susceptible to sampling error and cohort effects. Thus, the cohort level of analysis is more likely to produce unstable results for Aboriginal students.
- 11 The author does acknowledge that notwithstanding, these higher proportions may be more likely to occur in schools in where poor socio-economic conditions prevail.

- 12 Editor's note: Policy and program aimed at encouraging new transferees to become integrated, helping with the replacement of social capital networks, and reaching out to the families of these students etc., may have greater effects on helping improvement in completion rates.

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