

Youth Apprenticeship Programming in British Columbia

by

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Bachelor of Education, Simon Fraser University, 1988

A Project Submitted in Partial Fulfilment

of the Requirements for the Degree of

MASTER OF EDUCATION

Curriculum Studies

Department of Curriculum and Instruction

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University of Victoria

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Acknowledgements

I would like to express my sincere appreciation to Tim Pelton and Bonnie Watt-Malcolm who have guided me through the journey of piecing together this final project.

I would also like to thank the Ministry of Education Student Transition Project staff and the Industry Training Authority Research and Policy staff for supplying the education and apprenticeship records examined in this project.

Special thanks go to my wife and two daughters who have been exceptionally supportive and patient with me from the start of this journey.

Executive Summary

With a looming skilled-labour shortage in Canada, the government of British Columbia (B.C.) has introduced apprenticeship programming in secondary schools in the past two decades to increase the number of youth entering the skilled trades. Currently, secondary school students in B.C. can begin an apprenticeship through on-the-job training with an employer–sponsor in a program called Secondary School Apprenticeship (SSA) and/or get the first level of apprenticeship technical training through the Accelerated Credit Enrolment in Industry Training (ACE IT) program. Although approximately 3,000 students register in the youth apprenticeship program in B.C. annually, empirical research is lacking on the transition programming used by school districts to prepare for entry to this post-secondary programming.

This project used the apprenticeship and K-12 educational records of 22,909 individuals to supply provincial baseline data for two groups of apprentices: (a) those that started an apprenticeship while still in secondary school (the focus group), and (b) those that started after leaving secondary school (the comparison group). The purpose of this project is to elucidate three fundamental questions:

1. What are the demographic profiles of apprentices?
2. What grade 11 and 12 course work do apprentices take? and
3. What are the subject area achievement levels and graduation rates?

Data collected from the focus and comparison groups are compared and provincial norms help provide context.

Data were taken from Industry Training Authority (ITA) apprenticeship records between 2005 and 2009 on 13,357 individuals who started an apprenticeship while in secondary school by

taking SSA and/or ACE IT. The 9,552 apprentices of the comparison group were then selected from the ITA data base to match as closely as possible the age, gender, and trades of the focus group to enable clearer comparisons. The Ministry of Education supplied educational records for the subjects in both groups. These records were combined with the apprenticeship records and coded for anonymity. Courses were then sorted into 63 course categories and seven subject areas for the analysis.

Analysis of the data shows that the female, aboriginal and special needs designated cohorts of the focus group were about twice the size of the corresponding cohorts in the comparison group. Reasons for the larger focus group cohorts were suggested to be higher awareness levels due to school district marketing of youth apprenticeship programming and increased access to training and support. In addition, the focus group had higher combined grade point averages (CGPA) levels in all seven subject areas than the comparison group but lower than the provincial averages. Possible reasons for the higher subject achievement levels were targeted transition course selection by the focus group apprentices who were not content with traditional academic oriented programming and extra school-based student support.

Overall graduation rates of both the focus and comparison groups were within 4% of the current 79.6% provincial average. Male graduation rates in both groups were about 79% which is slightly higher than provincial average of 76.5%. Conversely female graduation rates for both groups were below the provincial average of 82.9%. While the female comparison group graduation rate is only 1.4% below the provincial average, the focus group female graduation rate is 10.3% lower. The much lower graduation rate of the focus group females may be in part attributed to the fact that almost half of the cohort were in one trade, hairstylist, which had the lowest combined grade point average and graduation rate of the five trades analyzed in this

study. The special needs and aboriginal cohort graduation rates of both the comparison group and focus group were at least 10% and 15% respectively higher than current provincial averages. There appears to be evidence of self-selection in the comparison group, which may be responsible for some of the discrepancy between the focus and comparison group graduation rates.

Above-average graduation rates for the larger focus group aboriginal and special needs cohorts may be attributed to participation in youth apprenticeship programming which could have been seen as an alternate and more relevant pathway to graduation. Also, once identified as potential youth apprentices, many of these students would have received extra in-school preparation and support, which would likely have had a positive effect on their graduation rates.

This project has provided some baseline data for two groups of apprentices. Similar follow-up quantitative studies on both groups examining apprenticeship and post-secondary records could provide more insight to help guide future educational and industry training policy development in B.C. at the provincial and regional/school district levels.

Introduction

Background

According to the government and Statistics Canada, British Columbia (B.C.) and the rest of Canada are on the threshold of a prolonged skilled-labour shortage of a magnitude that has never before been experienced in this province. Approximately 60% of this labour shortage will be due to attrition (primarily due to retirements) and the other 40% will be new jobs.

One approach adopted by the B.C. government to combat the impending labour shortage is to increase the number of youth entering into the skilled trades. Working through the Ministry of Education and Industry Training Authority (ITA), the B.C. government has developed two apprenticeship programs for secondary school students, Secondary School Apprenticeship (SSA) and Accelerated Credit Enrolment of Industry Training (ACE IT).

Only limited informal research has been carried out in B.C. (or Canada) on youth apprentices to establish baseline data for demographic profiles, secondary school achievement and graduation levels and the type of secondary school course work they are taking. To better prepare youth to enter an apprenticeship before or after leaving secondary school it is important to understand these young people and their secondary school backgrounds to establish baseline data. This demographic and educational data can then be used to gauge the effectiveness of student selection and secondary school preparation programs in the future. Also, very little data has been collected in BC on trades people once they leave the apprenticeship system. To know how long people continue in their trade once certified would be helpful for future industry training development (including youth programming) in B.C..

Research Objective

The objective of this research project is to identify factors that appear to predict, promote or impede the success of youth apprentices in the post-secondary system, apprenticeship system, and labour market to provide information that would assist the Industry Training Authority, Ministry of Education and Career Educators in creating, managing, and sustaining youth apprenticeship programs.

Research Questions

The research objective has been distilled into a number of research questions that will be used to assess differences in engagement, motivation, and educational performance between the focus and comparison groups. The research questions include:

1. What are some basic demographics of youth apprentices, including gender and Ministry of Education designations: Special Needs, English as a Second Language and Aboriginal?
2. What subject areas do the apprentices in the focus and comparison groups select and how do they compare to each other and to provincial norms?
3. What are the subject area achievement levels and graduation rates of the focus and comparison groups and how do they compare to each other and to provincial norms?
4. What differences and similarities exist, if any, when the cohorts of five selected trades are examined using the data obtained from three questions above?

The literature reviewed for this study indicates that preparation of tomorrow's skilled workforce is a hot topic with differing views on how this should be accomplished in a world of increasingly volatile economies and rapid changes in technology. One thing that all countries seem to have in

common is the need to overhaul education and training systems that are not in step with the needs of industry to be competitive in the global marketplace. .

Apprenticeship and educational data was collected from a group of apprentices who participated in a youth apprenticeship program while attending high school and another group that began after leaving secondary school. Results indicates young people in British Columbia entering the trades in recent years are attempting to prepare themselves for the realities of today's workforce with education that is relevant and that they believe will equip them with the skills and knowledge they will need to be successful.

Literature Review

Students entering vocational and technical careers from high school are part of a bigger youth transition picture that has recently come to the attention of policy makers. The literature in the first section of this review examines the changes faced by youth in the past 20 years as they become adults and enter the labour market. The second section investigates transition issues and recent policy reforms in select countries with similar situations and conditions (e.g., cultural, political and economical) to those found in Canada. New Zealand is the focal point of the international section because British Columbia (B.C.) is following a similar path in re-structuring its vocational education and training system. Attention is then turned towards Canada to explore education and labour issues on youth transitions and provide an overview of recent provincial strategies to facilitate students choosing vocational pathways. The last section of the literature review examines youth school-to-work transitions in B.C., drawing on comparisons from other Canadian provinces and New Zealand. I conclude with a review of scholarly literature that has identified where more research is required to facilitate school-to-work entry to the skilled trades.

Changes in Youth Transitions

The transition from youth to adult is a multifaceted process based on environmental factors and personal choices. The development of a work identity is an important step in establishing an adult identity. However, adult work identities are not developed in isolation and young people may not see them as being as important as other factors during the transition to adulthood.

The Organization for Economic Co-operation and Development (OECD) (2000) has described the transition to working life as “contextual.” Young people must contend with

economic, social, and educational factors as they take on adult roles that differ from one country and culture to another (Human Resources Development Canada, Applied, Research Branch 2000). Until the 20th century, the move to working life in the labour market was a fairly short, straightforward process for most young people, who tended to follow their fathers' or siblings' occupational choices. In the 20th century, these well-travelled and accepted pathways into the labour market became increasingly complex due to unstable international markets and continual advances in technology. Now in the 21st century, young people lack the clear frames of reference enjoyed by their forefathers as they attempt to establish adult work identities in a world they perceive as "filled with risk and uncertainty" (Furlong, 1997, p.44). McMillan and Marks (2003) characterized the entry to the labour market 30 years ago as a fairly rapid and linear move into stable full-time employment, which contrasts sharply with contemporary transitions. Transition into the workforce are not necessarily linear anymore as many young people now move in and out of education, training, work and non-labour market activities during the post-school years.

For young people establishing an adult identity, pursuing leisure interests or personal relationships will at certain times take a higher priority in their lives than stable employment (Dwyer, 1998). Therefore, the various aspects of transition in relation not only to education and employment but also to leisure, family and accommodation, are interlinked. Dwyer (1999) contended that these transitions are a multi-dimensional process, not a single event at one point in time (Ball, 2000; Du Bois-Reymond, 1998; Dwyer, 2001). Recently, researchers have even questioned the idea of youth transitioning into the labour market on pathways (Dwyer, 2001; Raffe, 2001) because it gives a false impression of order, and being too linear, instrumental and individualistic. These researchers claimed the official pathways (as designed or legitimized by

governmental and social agencies) might be largely symbolic, bearing little relation to the actual roads travelled by many young people.

Interestingly, it has been suggested that external forces such as economic constraints may not be the only reason for the non-linear school-to-work transition patterns of youth. Dwyer and Wyn (2001) have found “there is some evidence that this mixed pattern is not just due to economic constraints, but that many young people prefer this mixed pattern” (p.127). The sequential pattern of study followed by work does not apply to many young people, either because they are studying and working at the same time, or because they are making multiple changes from education to work, back to education, and back to work (Dwyer & Wyn, 2001), which creates a less transparent school-to-work transition pattern for youth. Vaughan and Boyd (2005) observed that the development of a working identity by young people has become more obscured without fixed beginning or end points and therefore does not fit the static definition used by current government and education policy makers. Wyn and Dwyer (1999) reported that recent research has shown mismatches between transition policy and young people’s experiences since:

It appears that young people do have some kinds of work identities but these are not fixed, nor necessarily mean what policy-makers might expect. Work is no longer something that happens after schooling; many young people now combine school and employment, which is likely to be caused by economic pressures and the preference of young people. (p. 127)

Riele and Wyn (2005) concluded that as long as governmental, social, and educational institutions continue to operate on the assumption of linear life courses, a substantial portion of young people whose life experiences do not match will be continue to be marginalized.

A more complex school-to-work process has recently emerged, affecting the length of the transition period. According to Raffe (2001), it is clear that both the starting and ending points of the transition process are variable. The OECD (2000) has found that the general lengthening of the transition period to adult roles may be attributed to the more self-indulgent behaviours of young people in transition who take more time off, work short term, and travel. For countries like New Zealand, these longer transition periods have been exacerbated through policies that have extended young people's dependence on family due to the burden of student loans. The OECD found the average duration of the transition rose by nearly two years in 15 OECD countries between 1990 and 1996. The reasons are complex and varied. They lie both in the nature of pathways through education, and in what happens to young people after they leave initial education (OECD, 2000; Taylor, 2007). The postponement of the transition to work by many young people might represent an unwillingness to commit to particular training or education programs leading directly to careers. This has been theorized as a coping strategy in response to the plethora of choices faced by young people (Du Bois-Reymond, 1998). Young people find the choices rather daunting. Vaughan and Boyd (2005) noted that one young contributor to a national newspaper in New Zealand argued that the abundance of choices and pressures to a set timescale was overwhelming for youth and created a situation that was paralyzing more than it was enabling.

For many adults, the effect of increased youth mobility and reflexivity may give the superficial appearance of features associated with adolescence (e.g., not settling down, trying

different approaches). Dwyer et al. (2003) suggested the evidence is contrary: the life patterns of young people reflect a new generation who have grown up in a different kind of social environment and make the necessary choices in coming to terms with it. Dwyer et al. (2003) believed a new type of adulthood has emerged that is not an extension of adolescence. The concept of a “new adulthood” shows the effects of social change on generational change. Evidence collected in an Australian longitudinal study of youth called “Life-Patterns” suggested that young people are blending the old and the new as they shape their lives (Dwyer et al., 2003). A shift in priorities has occurred as illustrated in Table 1 (below) although it is important not to exaggerate the potential significance of these changes. The paradox of “promise” and “uncertainty” in young people’s lives does not mean a dramatic break with the past. The respondents in the study are blending the old and the new as they shape their lives.

Table 1. Life Pattern Changes of Young Adults

Post WW2 Generation	Post-1970 Generation
Traditional family roles	Flexibility / reflexivity
Predictable career paths	Ongoing career paths
Collective identity	Personal autonomy
Upward mobility	Balancing commitments

Source: (Dwyer, 2003, p. 191)

Challenges in Education

The education of young people is a key element in the transition to an adult life and the development of a work identity. To prepare young people for entry into the 21st century

workforce, the OECD (1999) reported that education systems worldwide face formidable challenges due to “rapidly changing labour markets, increased competitive pressures and rising customer expectations inevitably translate into new demands on schools, colleges and universities” (Human Resources Development Canada, Applied Research Branch 2000, p.28). In terms of the dramatic change in school-to-work transition patterns in the latter part of the 20th century, the OECD (2000) has reported that in an increasing number of countries it is no longer the norm for young people to leave education permanently at the end of compulsory schooling in order to enter work.

Participation in upper secondary education is approaching universal levels in industrialized countries. Educators in secondary education are increasingly challenged to find ways to motivate and raise the achievement levels of weaker students in order to meet graduation requirements (OECD, 2000). Not only do education systems need to ensure that all young people entering the workforce have higher initial education levels, but instabilities in the marketplace and the shift to information-based economies have created challenges for post-secondary education systems to provide relevant vocational and technical education and training (VOTEC). As long ago as 1995, Carnoy pointed out that education’s importance as a source of economic growth has increased due to the shift in importance in the use and production of information in both developed and developing countries. Carnoy (1995) came to the conclusion that with the increase in the velocity of these changes, the vocationally educated will probably become increasingly penalized and governments that invest heavily in vocational education could be burdening their labour force with relatively greater inflexibility. Carnoy’s argument runs counter to the prevailing consensus that is typified in a 1990 UNESCO report which claimed that technical and vocational education is the connecting link between the school system

and the employment market. Therefore, developments in technical and vocational education are closely linked to general trends in the economy and the labour market. These two opposing camps reveal the dilemma facing educators in the 21st century. How can the youth of today be educated for the world of tomorrow, when that world is changing rapidly (Bagnall, 2005)?

A 2000 OECD report declares the challenge to upper secondary education is to lay a good foundation for lifelong learning during the transition phase. This holistic approach linking education to the real world echoes the pioneer work of Dewey and Adams from the early 20th century. Whips (2008) looked at Dewey's and Adam's views, purpose and the place of vocational education. He concluded that Dewey hoped to engage students in learning by merging theory and practice by experiencing occupations and believed that all vocational subjects should be connected in order to counter passive receptivity among his students. Whips acknowledged that although Dewey and Adams were supporters of vocational education, they believed a balanced education was necessary for individual growth.

According to Whipps (2008), Adams recognized that the limited acceptance of vocational education in many countries is due to a traditional prejudice toward anyone who engaged in physical labour. This prejudice is fostered by centuries of slavery and the feudal system. Conversely, academic education has traditionally been reserved for the privileged in most countries and is therefore the preferred and more socially acceptable educational pathway today. Wyn and White (1997) have also argued that the academic education bias persists today in many countries (including Canada), because the education institutions systematically marginalize students who do not wish to follow mainstream academic pathways. According to Taylor, non-academic educational pathways in Canada are often too narrow, too obscure (lack transparency), and too inflexible (lack bridging mechanisms) (Taylor, 2007; Win, 1997). Therefore, vocational

education pathways leading to blue-collar jobs are less desirable than academic routes to prestigious white-collar jobs.

Bagnall (2005) believed another deterrent for many students considering a vocational pathway in the rapidly changing labour market is the commitment to learning highly specific skills leading to vocational jobs even though they may command relatively high wages. A specialized skill set starts to look risky in a world of highly unstable markets; further training or retraining might soon be necessary. In contrast, general (non-vocational) courses offer not only a variety of career paths but also access to some of the best paying careers. The result is less high school graduates are inclined to select vocational career routes. Bagnall (2005) has also found technical and vocational courses being taught by universities/colleges as institutions have suffered from academic drift in an attempt to upgrade their status by becoming more and more like mainstream university courses. The academic drift of vocational programming therefore threatens to undermine the purpose of vocational education and training.

The increasing complexity of post-compulsory education and training systems together with increasing interest in lifelong learning has encouraged policy makers to develop more coherent, flexible, and interconnected systems of pathways (Taylor, 2007). The OECD (1994) found that many reforms in vocational education aim to keep students' educational and career options open longer, to develop broader and less specific curricula, and to increase the quality and relevance of the technical training. According to the OECD (1994), attempts to achieve these ambitious goals involve a combination of strategies, including: (a) deferring selection into initial vocational education and training, (b) eliminating vocational education and training tracks and vocational schools at the lower secondary (gr. 8-10) level, (c) increasing the proportion of vocational education courses offered at the senior secondary or post-secondary levels.

Additional vocational education reform strategies include: (a) creating closer links between schools and the workplace, (b) placing greater emphasis on academic studies in an applied context, and (c) opening new pathways from the secondary vocational sector to post-secondary education (McFarland & Vickers, 1994). The OECD (2000) suggested that most of the educational policy reform initiatives have common elements, including:

- The broadening of vocational programs and qualifications;
- The creation of linkages between general and vocational education;
- The development of combinations of school- and work-based learning;
- The establishment of bridges between secondary vocational education and training and tertiary education; and
- The development of more flexible education and training pathways. (OECD, 2000)

The provision of youth vocational training in the workplace (such as apprenticeships) offers advantages for educational programming and transitioning youth into the workforce. In a student transitions article, Gustafsson (2002) reported:

- Students obtain more up-to-date knowledge than at school, concerning, for example, modern machinery and modern work methods. They are given opportunities to apply their theoretical education to real situations.
- Students are gradually introduced to the norms and values of working life. They get used to the “climate” and “reality” of working life.
- Students obtain contacts that might lead to a job in the regular labour market.
- Many students in vocational programs appreciate workplace training as a contrast to more academic education at school; they are more motivated to learn. (p. 31)

Youth spending more time in post-secondary education over the last two decades has had profound effects on the labour market. A 1999 OECD report documents that youth participation rates in the labour market rose in the 1980s to over 70% by the early 1990s but fell to 61% by 1997. Almost 90% of this decline was caused by rising school enrolments and a reduction of student participation in the labour force. At the same time, many OECD countries saw an increase in non-standard work in the form of part-time work, short-tenure jobs and self-employment (Human Resources Development Canada, Applied Research Branch, 2000). Student participation in the labour market is influenced by a number of factors such as the availability and scheduling of work as well as the nature of employment in key industries such as retail, tourism and hospitality. Important factors include (a) longer opening hours, (b) the degree to which consumer demand fluctuates over the day, week or year, and (c) the extent to which part-time or temporary employment by youth is encouraged or permitted (OECD, 2000).

An OECD report (2000) suggested negative effects occur for youth and employers due to young people taking more post-secondary education to equip themselves for the labour market. The increased time in the education system means the youth are not working as much and lack relevant labour-market experience. This lack appears to be a worse handicap for youth seeking employment than it was in the past because they compete for jobs today with increasingly well-qualified adults. Young people with limited labour-market experience cause consequences for employers (particularly small and medium-sized employers) because in countries like Canada there is no tradition of providing structured training for new employees as there is in many European and some Asian countries. For employers without a training infrastructure, the costs of the inexperienced workers are higher today than in the past, so firms place a higher value on the

capacity to learn and the ability to adapt rapidly rather than on education (Human Resources Development Canada, Applied Research Branch, 2000).

Interestingly, while a lack of labour-market experience has impeded young people looking for employment, increased education levels seem to be an advantage in a job market where employers are using education as an employment-screening tool. Bagnall (2005) stated that the economic changes in many developed countries in the last few decades have resulted in a larger middle class and white-collar jobs that do not require specific skills but offer more routes to promotion and success. In recruiting, employers use education and formal qualifications as a way of ranking applicants (upskilling) as much as, or even more than, a guarantee of general skills. For a 16- or 17-year-old youth of slightly above average ability, this situation influences the relative attraction of educational choices. Du Bois-Reymond and Walther (1999) believed there is a “spiral-like adaptation” (Du Bois-Reymond, 1998, p. 189) whereby screening by employers leads more individuals to invest in gaining educational qualifications, which in turn leads to employers using a higher level of qualifications to screen for the same jobs. Even the OECD (2001), while arguing that the knowledge-based economy requires highly skilled and educated people, has also agreed that “upskilling” has occurred partly in response to rising levels of educational attainment in many countries (OECD, 2001, p. 195).

Riele and Wyn’s (2005) research findings indicated inherent assumptions in policy discourse on the transition associated with linearity and choice. The assumption of linearity in the transition process is a fundamental flaw in many policies designed to facilitate youth transition from school-to-work. McMillan and Marks (2003) pointed out that as long as governmental, social and educational institutions continue to operate on the assumption of linear life courses, people whose life experiences do not fit this linear model are likely to be

marginalized. Riele and Wyn (2005) asserted that choice creates an “ideal” transition, which few young people experience but which nevertheless drives debate and education policy. However, Spierings (1999) claimed that youth policy developed by governments all too often has an outdated one-dimensional view of young people which in reality limits their choice. Riele and Wyn (2005) concluded that much of the current transition policy is misconceived and too poorly aligned to be relevant to the lives of many young people. Policy makers in government, education and industry need to make some fundamental shifts in transition policy assumptions and direction in order to align youth transitions with the labour market.

As insecurity in the employment world is becoming characteristic of modern society, it is likely more young people will experience increasingly complex, non-linear transitions through education and employment. Riele and Wyn (2005) concluded that the implication for educational policy is to revise programs supporting the transition from youth to adulthood to allow for alternatives which match the variety of transition experiences so that policy intent and practice at all levels affects young people’s lives.

The OECD (2000) suggested that future policies targeting youth transition would need to become long term and flexible to be successful because young people in transition are a heterogeneous group. Therefore, policy responses need to take into account both the short-term needs of young people (help with finding and keeping a job) and the longer-term needs of education, training and the acquisition of social skills and attitudes. This requires consistent policy direction over a period of time, whereas policies in many countries including Canada are typically politically driven and short term.

Dwyer (1998) recommended that new strategic education policies include more diverse and flexible pathways. These pathways should have multiple entry and exit points to allow students to move laterally between programs and post-secondary institutions to keep their education and career options open. Dwyer believed this would require more diverse pathways, including opportunities for re-entry schooling that take into account a student's school and transition experiences regardless of the institution in which they are pursuing their post-secondary education goals. Dwyer identified some common systematic barriers to re-entry opportunities, including: (a) a lack of resource support (eg. counsellors, literature) for re-entry institutions, (b) the lack of a planned approach to transparent transition programming, and (c) lack of flexibility in the senior secondary curriculum to allow alternate graduation pathways.

To create more flexible transitions for youth it is important for both post-secondary and secondary schools to facilitate re-entry into the system. Schools must collaborate to ensure a smooth transition to the tertiary system. To aid in a better transition Riele and Wyn (2005) recommended flexible timetabling, appropriate curriculum and facilities, and a system that has respect for young people. To enable a smooth transition, welfare and other community support agencies should provide integrated and cohesive support that starts before the end of high school.

Government policy makers have generally been slow to understand and respond to the complex reality that youth experience as they transition to the workforce. The OECD (2000) recommended that, as countries begin to grapple with youth transition policy issues, all government policies should aim for several basic (measurable) goals, as follows:

- High proportions of young people completing a full upper secondary education with a recognized qualification for work, tertiary study or both;

- High levels of knowledge and skill among young people at the end of the transition phase;
- A low proportion of teenagers being neither in school nor employed;
- A high proportion of young adults who have left education having a job;
- Fewer young people remaining unemployed for lengthy periods after leaving education;
- Stable and positive employment and educational histories in the years after leaving upper secondary education; and
- An equitable distribution of outcomes by gender, social background, and region. (OECD, 2000)

The OECD (2000) found that more successful transitions tend to be associated with countries where the connections between pathways and their destinations are embedded in solid institutional frameworks. Soft skills were important and transition outcomes were often dependent on good personal relationships between the key parties and representative organizations. The OECD reported, “Good relationships help to improve the quality of information sharing, build mutual obligations, and promote trust” (OECD, 2000, p.83). In an effort to assist transition policies, the OECD (2000) noted that governments in many countries try to encourage local partnerships between educational institutions, employers and communities as a way of strengthening these relationships and improving the transition. Governments have provided incentives to stimulate the creation of intermediary bodies to act as brokers between educational institutions and employers in order to improve school-to-work transition.

Taylor cited a study conducted by the OECD (2000), which identified six features of effective transition systems:

1. A healthy economy;

2. Well-organized pathways that connect initial education with work and further study;
3. Widespread opportunities to combine workplace experience with education, and bridges between vocational education, apprenticeship, and tertiary education;
4. Tightly knit safety nets for those at risk of dropping out;
5. Good information and guidance; and
6. Effective institutions and processes. (Taylor, 2007)

The OECD has reported that educational pathways are becoming more flexible as policy makers respond to the wishes of young people and their parents, and the perceived changes in the nature of work. In a report on transitions, the OECD (2000) observed some common developments:

- More links are being created between vocational pathways and tertiary study;
- The vocational content of general education pathways is increasing;
- Modular curriculum structures are becoming more common, allowing young people greater choice in the ways in which they can combine different areas of study;
- In some cases an existing pathway is being offered in more than one type of institutional setting; and
- Non-university tertiary programs are being created or expanded. (OECD, 2000)

International Context

Shifting world markets and advances in technology cause constant economic and technological change. This situation means that detailed and quantitative planning for vocational programs is bound to be economically counter-productive because of its limited shelf life.

Bagnall (2005a) reported that the common response to economic strain by educational policy

makers in many industrialized countries is to make vocational programs less specific and more academic in nature (academic drift). Bagnall pointed out that in most European countries vocational programming has suffered from academic drift with 20-30% of the class time dedicated to general education subjects such as math and languages instead of the original vocational content. But the integration of academic and vocational programming has not always met with success. Green and Evans (2005) reported on England's attempt in the late 1980s to integrate key mathematic and language skill content into vocational programs as a substitute for more general education programming "not only narrowed the educational breath of what vocational students learned but it also contributed to lower levels of achievement in mathematical and language skills" (p. 170).

When the technologies used on the production line were simple and the rate of change was slower, only rudimentary training was required to equip youth for work. In the past, the practical skills acquired through apprenticeships or secondary vocational programs were sufficient to meet the needs of industry. Today, low-skilled work is exported to developing countries; jobs in developed countries require higher skill and knowledge levels. The durability of initial skills is getting shorter. In this context, vocational education cannot survive in its present form. The OECD (1995) found that because most secondary vocational education systems have traditionally prepared youth for work rather than for post-secondary education, the linkages between the two tend to be weak. Young people in developed countries who have faced the reality of changing labour markets have moved much faster than policy makers to ensure they have the education employers require. McFarland and Vickers (1994) reported that many students chose to complete a full secondary education in academic or comprehensive schools, thus deferring their technical and vocational training to the post-secondary years. Examples

included Germany, for example, where the proportion of students completing the *Abitur* examinations (i.e., that qualify youth for university) before entering an apprenticeship was steadily increasing which helps youth to hedge their bets in changeable labour markets but prolongs their school-to-work transition . McFarland and Vickers (1994) have noted that some policy makers have successfully responded to changing education requirements. They cited changes to Australian education policy that resulted in high school completion rates doubling in the 1980s and vocational and technical education rapidly becoming a post-secondary phenomenon. However, McFarland and Vickers (1994) also reported that some attempts at education policy reform have met with only mixed success. In the United States the number of academic courses required for high school graduation have increased to improve the general education levels of youth but the additional academic requirements limited vocational course offerings. Vocational courses were consequently moved to the margins of the curriculum and precipitated a sharp decline in enrolments in technical schools. De Broucker (2005) asserted that the decline in initial vocational education might be due to the narrow focus of the programming, which became a less attractive option for students.

In the U.S., the OECD (1995) reported that nearly 60% of high school graduates go to university. Of that group, approximately 25% receive a baccalaureate degree, which means the U.S. education system is concentrating on roughly 15% of the students (De Broucker, 2005). The academic bias of the education systems in many countries is due in part to the common belief that higher education levels are linked to higher income potential. Thurow's (1999) findings dispute this long-held belief. Thurow gathered 20 years of U.S. education and income statistics from the 1980s and 90s on higher average levels of education of both partners in median and below-median income households. He found that during this 20-year period, high

school degrees more than doubled and college degrees almost quadrupled in the households in the study. Being better educated, these families should have been earning more but they were not. Thurow's findings indicate that, at least in the U.S., spiralling education levels seem to be reaching the saturation point when compared with earning potential.

In an effort to increase participation in vocational education, the U.S. government introduced a promising strategy in the early 1990s to improve the quality and status of initial vocational education. The aim was to ensure that students in vocational education pathways qualified for post-secondary education and training. The "two-plus-two" Tech Prep programs (which connect the final two years of high school with two-year community college programs) were enabled by financial incentives provided by the federal government and are now regularly funded national programs. According to the U.S. Department of Education (2009), roughly 47% of the nation's high schools (or 7,400 high schools) offer one or more Tech Prep programs and nearly all the community and technical colleges in the country participate in the program, as do many universities, businesses and union organizations. In addition, most community and technical colleges in the nation participate in a Tech Prep consortium, as do many universities, private businesses, employer and union organizations. Despite the high participation levels, the U.S. Department of Education (2009) has found the effectiveness of Tech Prep programs to be inconclusive. Only a few states have found evidence of improved grade point averages, retention rates, graduation rates and higher post-secondary enrolments (McFarland & Vickers, 1994; U.S. Department of Education 2009).

France has had success increasing the appeal of vocational education and career pathways. Like the U.S., France has a history of an academically biased education system, but realized the need to increase the appeal of their vocational education system when they entered

the European Union. In the late 1980s, a group of French economists was brought together by the government to predict the type of worker France would need for the years leading up to 2000. To enter the European Union, the economists determined that France needed a new type of worker who was part-skilled tradesperson and part-technician, which resulted in the creation of the more flexible and vocationally oriented Baccalaureate Professional high school degree (Bagnall, 2005). Mas and Werquin (2005) found the Baccalaureate Professional (Bac Pro) has capitalized on the prestige of the two existing Baccalaureate degrees. Those who finished the Bac Pro were treated as equal with the other two Baccalaureate qualifications (Bac General and Bac Technologique) and were free to enter university or any other higher education institutions, which increased its appeal. The Bac Pro was seen as a way of creating a qualification geared towards the employer and useful upon entering the workforce. One of its purposes was that schools would work more closely with unions and employer organizations. Bagnall (2005) reported that the Bac Pro has helped move France from a nation of school-to-work transition to a nation of “transitions” where young people go back and forth between education or training and the labour market.

The French Baccalaureate Professional has brought flexibility and transparency to the French education system for students transitioning from secondary schooling to post-secondary vocational pathways, which contrasts sharply to what is found in England. Green and Evans (2005) described the transition from compulsory education to the English post-secondary vocational education system as “lacking a clear purpose and definition which has contributed to an overall lack of transparency” (p. 168). Green and Evans claimed the English vocational institution structure is complex and confusing, with a diversity of routes, training providers and modes of study. This means that there is no normative pattern of vocational study, which makes

it difficult to establish clear and consistent norms and expectations and therefore it results in a lack of reliable high-quality standards. Green and Evans concluded that while English academic pathways are well understood and trusted, the vocational education sector is confusing, poorly branded and consequently difficult to market effectively

Another issue Hodkinson et al. (2002) raised is that attainment of a qualification in the English vocational education system does not guarantee valuable learning. They suggested that the learning context, process and expertise of the individual education and training institutions are at least as important as qualification structures for quality assurance.

Despite several national attempts to overhaul of England's vocational education and training system since the 1980s, Green and Evans (2005) found that well-intended government reform policies are often undermined because of persistently low public expectations of young people and the education system. Keep and Mayhew (1997) reported that the lack of English vocational education reform could be explained by wrong assumptions. These assumptions are habitually applied by policy makers to the labour market and to the ways in which young people make their transitions to adult life. Wrong assumptions about the labour market, including the demand for training, is constant because policy makers assume all employers want to up-skill their employees to stay competitive. Keep (2002) found that many employers have shown little interest in up-skilling their young workers; therefore, policies based on these assumptions are doomed to failure. Keep and Mayhew (1997) maintained that policy makers have been slow to recognize changes in the English labour market such as the shift of employment out of manufacturing and into the service sector, the growing "casualisation" of employment, increased demand for female labour, and increasing numbers of young people employed in part-time and temporary jobs.

English policy makers have also made wrong assumptions about how young people make decisions about their learning and careers. Dwyer and Wyn (2001) found that labour market policies in England designed to help youth to transition often emphasize the importance of individual responsibility. In practice, many of these policies tend to operate in ways that compromise youth responsibility and individualism and have other unintended consequences. Still, Dwyer and Wyn reported that many young people are becoming increasingly pro-active and are making pragmatic choices for themselves, which enable them to maintain their aspirations despite the persistence of negative structural influences on their lives.

In Australia, vocational education and training (VET) has suffered from policy and prestige issues that have limited participation. Dorrance and Hughes (1996) reported that declining vocational education and training enrolment manifests itself at the post-secondary levels of training. Australia has more students at university than in Technical and Further Education institutions (TAFEs) even though managers, professionals and para-professionals that require university degrees represent only 30% of the labour force. Riele and Wyn (2005) found that Australian education and youth policies are more closely aligned with transitions experienced by previous generations, when labour and economic markets were more stable and allowed a linear transition to the world of work. They believe the first step in addressing this policy challenge is to gain an understanding of the circumstances facing young people today in an increasingly fluid and complex world.

In the 1990s, the Australian government began to align VET policy and programming more closely to the complex transitions that most Australian youth were experiencing. Ainley et al. (1997) reported that policy realignment efforts had a positive effect. Australia now has a less differentiated system by providing vocational education in schools, orienting senior school

programs toward the world of work and broadening the scope of VET programs. Vocational education programming efforts create a smoother and more transparent school-to-work transition through a series of VET programs offered in high schools. In 1996, the Australian Student Traineeship Foundation (ASTF) was launched and, according to Spierings et al. (1996), is typical of the education re-alignment programs introduced by the Australian government. ASTF offered students in grades 11 and 12 an opportunity to combine school-based studies with work experience and off-the-job training in a variety of vocations. Spierings found ASTF increased high school completion rates because students had more vocational education pathway choices. These extra vocational pathways made the transition to employment easier. In a recent CPRN report, Taylor (2007) cited recent Australian statistics that show participation in VET transition programs like ASTF have grown in high schools from 38% in 2000 to 50% in 2004 and increased student retention rates. However, despite the successes of Australian high school transition programs Smith (2004) noted that some old issues remain unresolved, including: resource challenges, shortage of qualified teachers, debate over the quality of training provided by different institutions, low status of programs, and questions about the educational and market value of VET programs in schools.

In New Zealand, transition reforms involving the restructuring their vocational education and industry training systems have and continue to influence those in British Columbia. Some comparisons between the two systems will be made later in the British Columbia section of the literature review.

As with many of the countries covered in this review, New Zealand faced the situation where vocational education has been chronically devalued due to its association with (academic) school failure (Vaughan and Boyd, 2005). The New Zealand government realized that few clear

education pathways after high school led to vocational training. To combat this situation in the 90s, Vaughan and Boyd noted that the New Zealand government targeted youth transition to the workforce as an area for increased programming policy and budget support. In an ambitious move to create more non-academic and flexible education pathways with multiple entry and exit points, the New Zealand government introduced the National Qualifications Framework (NQF). The NQF was a platform to overhaul the traditional academic and vocational education systems. Peddie (1998) claimed that New Zealand's NQFs differed from the education models found in other countries because it endeavoured to create an open credit transfer system based on an outcomes model, recognize prior learning, and remove the 'time-served' aspect of gaining qualifications. According to Vaughan and Boyd (2005), the New Zealand Ministry of Education's NQF model was an effort to meet increasingly important needs associated with skills and knowledge in the economy. It was charged with providing qualifications that would be credible and useful to employers, be understood by the public, and enable students to find ongoing opportunities to achieve their chosen qualifications.

In a recent paper, Vaughan and Boyd (2005) gave an overview of the NQF model:

The NQF endeavours to make the organization and attainment of educational qualifications and the provision of education "seamless." This was consistent with the tertiary focus on participation and the increasing involvement of industry in education policy, leading to a trend of recognizing more diverse (non-academic) learning and learning outcomes. To ensure current labour market needs were being addressed in vocational education, the qualifications reform was managed through the creation of Industry Training Organizations (ITOs), which developed pass-or-fail units of standards. The units of standards were designed to represent competency of performance for one or

more elements of a particular skill, related to specific industry skills in the workplace, and could be grouped together in various different ways to secure a qualification. One of the new qualifications most directly related to transition was the National Certificate in Employment Skills (NCES). This qualification formalized the content of transition courses and enabled schools to provide a “transition” qualification to students.

Implementation problems for schools were overcome with the addition of achievement standards. The mix of achievement standards and unit standards formed the mainstay of the new National Certificate in Educational Achievement (NCEA), which was developed in an attempt to give equal status to non-conventional (often vocational) as well as conventional (usually academic) subjects. (pp. 103-4)

Vaughan and Boyd (2005) noted for the NQF's to achieve a “seamless” school-to-work transition attention would be focused on students who are still in high school. Furthermore, NQFs opened up the possibility for schools to offer similar qualifications to those of tertiary institutions through the standards relating to clear levels of achievement, which were credentialed through various national certificates, offered at various institutions. Vaughan and Boyd (2005) noted that the standardization NQFs brought to New Zealand's education systems cleared the way for secondary and tertiary institutions to start aligning their curricula and programs. This program aligning allowed students to gain Level One or Two certificates while in secondary school and then transition to Level Three or Four at a tertiary institution (which also offered Level One or Two qualifications).

Two national programs in New Zealand have been developed to assist secondary school students wishing to take vocational pathways (similar in purpose and design to the two youth apprenticeship programs in British Columbia). In 1996, the Ministry of Education established

the Secondary-Tertiary Alignment Resource (STAR), which is the most widely used school resource for transition. According to the New Zealand government (2009), the aim of STAR is to create a smooth transition for senior secondary school students to suitable pathways leading to work or further study at the secondary or tertiary level (New Zealand Ministry of Education, 2010). Depending on a school's interpretation of its students' needs, Vaughan and Boyd (2005) reported that STAR funding may be used to pay for courses delivered by secondary schools or public and private tertiary institutions, which gives the STAR program the flexibility to meet needs right to the community level.

In 2001, the Gateway program was introduced into New Zealand high schools. Like STAR, Gateway is designed to provide senior secondary school students with learning opportunities in non-conventional subjects tied to the student's particular interests. Unlike STAR, Vaughan and Boyd (2005) reported that Gateway is based on workplace-based learning and assessment. The programs operate through school-employer agreements with either a school co-ordinator or a broker at each school setting up and managing the contracts (Bagnall, 2005; New Zealand Government, 2010).

STAR and Gateway transitioning to the workplace was assisted when the government passed the Modern Apprenticeship Act in 2001. Modern Apprenticeships subsidizes employers to provide young people with on-the-job training and mentoring, and gives trainees the opportunity to gain nationally recognized qualifications either through on-the-job industry training or through vocational training with tertiary providers. The New Zealand government reported that there were over 10,850 modern apprentices in 31 different trades in 2007 (New Zealand Tertiary Education Commission, 2007).

Boyd et al. (2004) reported that New Zealand's pathways-based transition education initiatives emphasize the importance of allowing young people to make choices throughout their senior secondary schooling. Students have reported that experiences in the STAR and Gateway transition programs have helped them clarify what they were (and were not) interested in, in terms of a career. Vaughan and Boyd (2005) asserted that the flexibility of the New Zealand education system allows for confusion to due to the plethora of options available. They suggested that freedom of choice could become a constraint. It has added tension due to the competing demands of the educators at the secondary and tertiary levels because the purpose of these initiatives is not yet completely clear.

While more research is needed to identify the interests and perspectives of young people, the changes in New Zealand's education systems indicates the government's understanding of the global reality. The acceptance that school-to-work transition difficulties experienced by youth can be overcome underpins the New Zealand approach to vocational education and transition policy reform.

Many transition issues faced by the governments and education systems covered in this literature review have common elements, such as:

- Poor communication and cooperation between key stakeholders (government, employers, education); and
- Culturally and institutionally imbedded social prejudices that favour academic education/white collar jobs and discriminate against vocational education/blue collar jobs.

These issues generate a number of other problems for many countries, including:

- A lack of labour-market needs data;
- Obsolete and/or misguided government, education and industry labour market supply policies and programs;
- Vocational education and training systems that are misaligned with the needs of the industries they serve; and
- Vocational education and career pathways that suffer from a lack of prestige.

Policy makers' lack of awareness of changes in the marketplace, employers' needs and youth transitions is one factor. Combined with the lack of communication between key stakeholders in many of the countries, the result is 30 years of transition policy that has been out of step with the realities faced by both employers and youth. Canadian youth are not immune from this dilemma and the ability to provide consistent and effective policy in Canada is hampered by changing federal and provincial policies that are mutually inconsistent. As the world continues to transform economically and technologically, according to Bagnall (2005b), the effect on society has been fundamental and destabilising. Raffe (2003) pointed out that the only certainty for youth is that "both the starting and ending points of the transition process are increasingly indeterminate" (p. 179).

The Canadian Scene

Rising skill demands in OECD countries have made high school diplomas the minimum requirement for successful entry to the labour market and the basis for further participation in incremental learning. Like many other OECD countries, Canada predicts that nearly two-thirds of the new jobs will require more than 12 years of education and training; half of those will require more than 17 years of education and training (McFarland & Vickers, 1994). In a CPRN report on high school dropouts in Canada, De Broucker (2005) found that secondary education

systems do not necessarily provide skills recognized by Canadian employers. In the same report, De Broucker noted that although employment rate statistics for high school graduates in Canada are high when compared to other countries, this is misleading because many high school graduates move directly into post-secondary education. This reduces the number of youth competing in the job market, giving the illusion of high employment rates.

Only 12% of jobs in Canada do not require high school graduation (Statistics Canada, 2007). Therefore a high school diploma has almost become mandatory for Canadian youth to transition into the labour market. The OECD (1999) recommended that Canadian policy makers should concentrate on policies and measures that would (a) prevent young people from leaving school early, and (b) encourage them to obtain recognized occupational qualifications—if possible at the post-secondary level—before entering the labour market. The OECD believed Canada's answer to increased graduation levels lay in offering similar programming to that found in New Zealand with a broader range of vocational courses and more integrated programs of general and vocational education and training (Human Resources Development Canada, Applied Research Branch, 2000). This recommendation runs counter to the deeply rooted academic orientation of the education systems found in most of Canada.

One purpose of the Canadian education system has been to provide educational programming to prepare students for entry into university. It is only there, De Broucker (2005) asserted, that “young people will eventually acquire knowledge and skills that employers will recognize and value. Young people are therefore ‘pushed’ towards post-secondary academic institutions as the main if not the only source of necessary labour market credentials” (p. 53). OECD (1999) education statistics seems to support De Broucker's argument. Canada ranked fourth in the proportion of the 25-34 year old population with a university degree and had the

highest proportion of its population aged 25-64 with a college or university credential (Human Resources Development Canada, Applied Research Branch, 2000)

Given the academic bias of the Canadian education system, it is not surprising that teachers continue to value the success of students in the academic tracks more highly than in vocational or work-oriented options. Canadian educators generally understand the needs of students who perform well in academic subjects and plan to follow the mainstream route from school to university. There appears to be less support and guidance for the students *not* choosing this pathway. In Ontario, for example, evidence of academic bias by secondary school educators has appeared in some reports, as follows. An Ontario government study (2005) found that “some guidance counsellors and school administrators perceived Cooperative Education as inappropriate for ‘academic’ students” (Taylor, 2005). In Quebec, concern was voiced by some parents, students and other young people that school guidance services did not provide adequate and relevant information on labour market opportunities and access to careers other than through the academic route. In Nova Scotia, school counsellors spent their time on administrative tasks and were perceived as lacking knowledge about local labour market opportunities (Human Resources Development Canada, Applied Research Branch, 2000). The OECD findings (1999) indicated that the academic bias of school counsellors and other personnel was partially due to a lack of communication between the worlds of school and work. The same OECD review concluded that the Canadian education system could ill afford not to service almost a quarter of a million (11%) 20-24 year olds who have not graduated from secondary school. The system has narrow views of student transition programming from high school and needs to broaden the scope and number of high school transition programs (Human Resources Development Canada, Applied Research Branch, 2000).

Given the history of academic bias in the Canadian education system, it is not surprising that high school students tend to share this low opinion of VOTEC and have a negative perception of pathways leading to the trades. Taylor (2005) noted the Conference Board of Canada (2000), reported there is a negative portrayal of trade-related occupations at the high school level. “If you are interested in trades you are made to feel like a second-class citizen” (p. 26). Furthermore, the 13-18 year cohort who participated in a Skills Canada study (2002) described trades people using terms such as “dirty, crappy, plunger people, stinky, heavy belts and pants falling down” (p. 13). Participants tended to describe a typical trades person as male, 40-something, grubby, overweight, poorly dressed, tired and inarticulate. These negative portrayals of trades people are perpetuated by the media. In fact, many of the focus group participants made references to the television programs that identified Roseanne’s husband from *Roseanne* or Al from *Home Improvement* when asked who would be a role model for trades people (Business Council of British Columbia, 2003). However, this public perception of people in the trades may improve with some of the newer reality TV shows like *Dirty Jobs* where trades people are portrayed in a positive fashion and the work they do as important.

A 2001 survey conducted by Skills Canada reflected the bias of Canadian youth towards academic post-secondary education with 44% of respondents aged 16-29 recommending a younger friend pursue a university education. Moreover, 25% of the survey respondents said they were discouraged by friends and family from considering a job in the skilled trades and technologies in order to get a more prestigious job with a higher salary (Business Council of British Columbia, 2003; Skills Canada, 2001).

In a 2007 labour market report, Taylor (2007) identified several Canadian educational barriers or issues that need to be resolved by policy makers in order to increase participation in vocational education programming and create a more seamless transition to vocational pathways:

- Three decades of vocational program decline in high schools due to concerns about streaming students too early and a decline in many industrial and commercial occupations (Smaller, 2003);
- Declining enrolments;
- Obsolescence of equipment in many schools;
- Tendency to move vocational programs into post-secondary institutions (Council of Ministers of Education Canada, 1998);
- Employers are often more interested in short-term labour requirements leaving little time to collaborate with schools (Hardy & Parent, 2003); and
- Other barriers to creating effective vocational education programs: attitudes of parents (want university), highly fragmented employer community, federal/provincial jurisdiction debates and a lack of strategic policy to address the issue at a systems level. (De Broucker, 2005; Taylor, 2007)

As in other countries, increased education levels have been deemed necessary by Canadian employers to enable them to compete in the global marketplace where advances in technology have become a constant. The educational push young people experience in Canada has been fostered by a weak economy during the 1990s when government sponsored programs for youth such as job creation and employment subsidies declined. During this time, the OECD (1999) reported that Canadian labour market policies and programs for youth had shifted towards encouraging young people to complete high school and engage in further formal education, as

well as towards programs facilitating the school-to-work transition (Human Resources Development Canada, Applied Research Branch, 2000). Although Canadian policy makers encouraged youth to stay in school longer, they did not provide a direction that would ensure the extra education would target the immediate and future needs of Canadian employers. A Conference Board of Canada report (2002) cited complaints from many sectors about shortages of “qualified” youth labour even in areas where there are high levels of youth unemployment. The report found that despite increased post-secondary enrolments in Canada, a lack of labour market research and policy development by business and government could be blamed for the poor alignment of post-secondary programming and the needs of the Canadian labour market (Kurtis, 2002). The report offers several causes for the mismatch in education and skills, including: (a) formal education may not be the most effective way for all youth to develop the skills, attitudes, and behaviours that make for effective employees; (b) in aggregate terms, the Canadian education system is developing the wrong mix of technical and employability skills; (c) for many youth, the trend of youth staying in school longer merely delays entry into the labour market without giving them any significant productive advantage in that market, and may be better served by pursuing other options (e.g., apprenticeship) that get them working without the protracted delays associated with what becomes a postsecondary education offering limited opportunities in the labour market (Kurtis, 2002).

The lack of communication and coordination between key government, industry and education stakeholders in Canada has made the school-to-work transition more difficult for young people in general, including some who have college diplomas and university degrees. The OECD (1999) reported that despite their education level, young people now require greater persistence and initiative in searching for and keeping employment (Human Resources

Development Canada, Applied Research Branch, 2000). An OECD report (2000) on transitions noted another trend in Canada that shows the mismatches between educational programming and labour market requirements. University graduates who cannot find employment compatible with their education qualifications enrol in vocational or technical courses in community colleges in order to gain marketable skills. The OECD claimed this inefficient re-education to facilitate transition into the workforce has two negative effects: (a) it increases young people's time in school, and (b) it increases expenses in the education system. Re-education limits labour market experience and reduces productive work life. Another issue facing many young Canadians after extended periods of post-secondary education is large student loans. In order to pay back the student loan after graduation, these students need higher paying jobs than many of their European counterparts where education is subsidized by the government (De Broucker, 2005).

More young Canadians spend more time in the education system so they are less employable due to a lack of on the job experience and awareness of labour market realities, as noted above. The Conference Board of Canada (2002) claimed that inexperience in the labour market is probably a major factor for Canadian youth in the 15-24 age cohort having a 58% dismissal rate from first jobs, one of the highest in OECD countries (Kurtis, 2002). The poor initial performance of Canadian youth in the workforce, according to De Broucker (2005), is at least in part due to the lack of preparation students receive in secondary schools. In contrast, many OECD countries do more than Canada to provide labour market skills to students at the beginning of upper secondary through work-based apprenticeship or through school-based vocational systems (Taylor, 2007).

The weak involvement of Canadian employers in skill and related policy development can be traced to their tendency to have a short-term view of skill needs and skill development.

Canadian employers have traditionally relied upon skilled immigrants and students from publicly funded vocational institutes, colleges and universities for a supply of qualified employees. For much of the 20th century, this system of labour supply was able to meet labour needs without expense to employers. Although this labour supply system seems to have worked well in the past, it rested on the assumption that employers' skill needs would be relatively stable over time and that changes could be predicted well in advance so as to allow new courses to be developed. This short-term approach to skill supply in Canada has become less efficient in the unstable and unpredictable labour markets of today. Lack of Canadian employer input and involvement in VET is at least partially responsible for vocational curriculum becoming general in nature and asynchronous with the needs of current labour markets.

The OECD (1999) noted that the lack of Canadian employer participation in VET has left the apprenticeship system in Canada poorly developed. Only about 1% of the Canadian labour force is in apprenticeships, concentrated in a small number of trades, mainly automotive repair workers, carpenters, and construction electricians; it typically involves adult workers (Human Resources Development Canada, Applied Research Branch, 2000). The National Apprenticeship Survey reports the average age of an apprentice in Canada in 2007 was between 25-34, and only about 7% of registered apprentices were under the age of 20 (Statistics Canada, 2011). The 1999 OECD Canadian school-to-work transition review concludes the short-term, opportunistic view of skill development in Canada needs to be corrected to emphasize (a) the students' lifetime skill and learning needs and (b) the longer-term requirements of economic development. Young people and employers may be better served by providing a well-designed combination of general and occupationally specific skills (Human Resources Development Canada, Applied Research Branch, 2000).

The key stakeholders in Canada have recently indicated a growing awareness of school-to-work transition issues. The economic upswing Canada has enjoyed for most of the past decade, combined with a growing number of retiring baby boomers, has increased employer concerns about shortages in various occupational areas, including the skilled trades. Taylor (2007) reported that mismatches between students' educational and occupational choices and labour market needs have stimulated interest in providing youth with information about the career pathways in demand, and opportunities to develop skills that employers are looking for (Taylor, 2007). The OECD (1999) reported that the Canadian government's views on career development are changing as are employers' views about the degree to which market mechanisms alone can ensure the responsiveness of Canadian education and training system to shifting skill and market requirements. There is also increased concern felt by business and government about the need to develop policies to address changing skill requirements, economic restructuring, and ensure the smooth transition of young people from education to employment (Human Resources Development Canada, Applied Research Branch, 2000).

Improving school-to-work transitions to meet current and future Canadian skill demands must involve all the major stakeholders. McCrea and Phillips (2007) pointed out that it is the responsibility of government, employers, unions, schools and ministries of education and advanced education across Canada to develop ways to enhance career pathways programs in Canada's secondary schools (Silva & Phillips, 2009). Two Canadian reports by Taylor (2007) and De Broucker (2005) indicated that a more effective VOTEC transition system in Canada would require:

- Strong political leadership at federal and provincial levels to seek counsel to define objectives and set up a framework for developing vocational education pathways;

- Greater integration of appropriate vocational education into curriculum;
- Improved counselling;
- An enhanced sense of social responsibility on the part of the business community—a community often considered too fragmented to participate in such large-scale transformation—as employers, both in the private and public sectors, would be called upon to participate actively; and
- Concerted efforts to communicate the value of the new opportunities to parents and students whose perceptions and attitudes are often considered the main barrier to action.

(De Broucker, 2005; Taylor, 2007)

De Broucker (2005) noted that successful student transition systems exist in countries that have built efficient vocational education programming. This evidence indicates that much of the youth population is better served through structured learning in both a school setting and a work environment. De Broucker's findings indicate that these factors reduce dropout rates as young people benefit from a different approach to learning useful skills. It provides real skills that meet a demand in the labour market and many vocational education graduates find appropriate jobs (De Broucker, 2005).

In Canada, the OECD (1999) found the main focus of education and training reforms in the 1990s have been intended to improve the transitions by (a) encouraging high school completion, (b) encouraging participation in post-secondary education, (c) expanding vocational and technical education as well as co-operative education and internship programs, (d) providing career development courses, orientation and counselling, and (e) in some provinces, developing youth apprenticeship (Human Resources Development Canada, Applied Research Branch, 2000). Evidence suggests that these efforts to improve transitions are successful. For example, the B.C.

Business Council reports that from 1991 to 2001, the number of Canadians aged 25 and over with a trade, college or university credentials increased by 2.7 million. This equates to a 39% increase and indicates a growing number of Canadians are completing post-secondary education. The B.C. Business Council reported that in 2001 there were approximately 2.4 million Canadians 25 years and older with trades qualifications (Business Council of British Columbia, 2003). Taylor (2005) confirmed that recent provincial efforts have been made at the secondary school level to revitalize technology education curriculums and provide more support for students in their school-to-work transitions (Taylor, 2007). Taylor reported that some provinces have developed high school apprenticeship entry programs that allow young people to get started on training in skilled trades without abandoning their secondary school studies. The OECD (1999) findings indicate that high school apprenticeship programs aim to increase the number of youth in apprenticeship training and attract more young women in order to alleviate skills shortages in specific trades and to correct age and gender imbalances. The OECD noted that all provincial youth apprenticeship programs follow essentially the same model, providing an alternative path to apprenticeable occupations at a younger age while allowing students to keep open the option of attending college or university later (Human Resources Development Canada, Applied Research Branch, 2000).

The introduction of provincial apprenticeship programs into secondary schools has been modest, generally involving small numbers of students. It has met with varying degrees of success. Taylor (2007) noted the following efforts across Canada:

- A high school apprenticeship program was piloted in Newfoundland in the mid 1980s but never implemented due to a downturn in the economy. A 2003 Newfoundland government report recognizes the importance of such programming.

- In 1998 Ontario introduced the Ontario Youth Apprenticeship Program (OYAP), but due to the work experience orientation of the program only 18% of OYAP participants in 2004 were in apprenticeships.
- The 1999 Common Curriculum Initiative in Ontario emphasizes the importance of out-of-classroom career-related experiences and requires all school boards to offer cooperative education, work experience and school-to-work transition programs.
- In 2005 Ontario launched dual credit programming similar in structure to those in B.C. Dual credit programs provide students with the opportunity to take post-secondary courses while in high school, and receive graduation and post-secondary credit. Programs included Level One apprenticeship technical training; expanding the availability of dual credit programs across the province is a Ministry priority.
- In an effort to increase student retention and graduation rates, the Ontario government has passed legislation increasing the mandatory school age from 16 to 18.
- Alberta introduced the Registered Apprenticeship Program (RAP) in 1991. RAP is a joint venture of the Department of Education and Apprenticeship and Industry Training. Other key players are the industry organization “CAREERS the Next Generation,” local employers, schools and students. Although this program has not involved large numbers of students there are high levels of satisfaction from all the stakeholders.
- In the late 1980s, B.C. introduced the Secondary School Apprenticeship (SSA) program, which has grown steadily since its inception, with a current annual enrolment of about 900. SSA students receive credits towards graduation for apprenticeship work-based training hours and can qualify for a \$1,000 scholarship.

- In 2005, B.C.'s Industry Training Authority partnered with the B.C. Ministry of Education to launch an apprenticeship technical training program for high school students called the Accelerated Credit Enrolment in Industry Training (ACE IT) to complement the SSA program. ACE IT is a dual credit program and has been a success since its introduction; it has an annual enrolment of over 2,000. (pp. 2-3)

Many transition programs in Canada struggle to secure a toehold in their provincial education systems. Funding is a constant issue, as is the battle for legitimacy in a system that is dominated by academic curriculum and academic transition pathways. Numbers in vocational programs are growing in most of the western provinces due to skill shortages and a retiring workforce. B.C. has enjoyed a strong economy for most of the past decade and a skills shortage that has been well reported in the media. These factors have increased the provincial government and high school student interest in the trades. B.C. has some of the most established and arguably the most progressive and innovative high school transition programs (particularly in the trades) in the country.

In British Columbia

The introduction of the Industry Training Authority (ITA) in 2004 marked a new era in industry training in British Columbia. The ITA is the Crown agency charged with the responsibility of managing standards and credentialing of trades and industry training programs in B.C. The governance system introduced by the ITA is not driven by the provincial government, as has historically been the case in B.C. Instead, the approach to trades training in B.C. is similar to New Zealand's approach, using an industry-led model to ensure that labour market needs are being met. As in New Zealand, B.C.'s industry sectors are represented by Industry Training Organizations (ITOs). The ITOs are the mechanism responsible for working

with the various industry sectors and the ITA to produce training that meets the requirements of industry (Industry Training Authority of British Columbia, 2009b).

The leadership role played by industry in the development of B.C.'s industry training policy and programming is unique in Canada. Since 2004, seven ITOs have been established to represent the interests of construction, resource, transportation, hospitality and tourism, horticulture, and automotive sectors. The ITOs are involved in the creation and updating of industry training programming as well as working with industry to promote the trades as a career option.

The Multiple Assessment Pathways (MAP) project is another ITA initiative that has been endorsed nationally by the Canadian Council of Directors of Apprenticeship (CCDA). The MAP project is similar in nature to the New Zealand NQFs in that it requires an inventory of skills to define the competencies in each trade and be used for a number of different forms of assessment, including practical examinations to determine a person's competency in a trade. The purpose of the MAP project is to augment written exams, which are currently the only assessment tool for national "Red Seal" trades certification (Industry Training Authority of British Columbia, 2010).

A parent survey conducted by the B.C. Business Council in 2001 found that fewer parents in B.C. have aspirations for their children to attend university (48%) than the national average of 69% (Business Council of British Columbia, 2003). Although the author could not find a published reason for the discrepancy in parental expectations, it could be rationalized by the fact that B.C. has historically had a resource-based economy where well-paying jobs that required little or no post-secondary education or training have been plentiful throughout most of the twentieth century.

Although the education system in B.C. shows the academic bias found in other provinces, it is not as strong. A B.C. Business Council report (2003) found that B.C. parents are becoming more open to the idea of other education pursuits for their children beside university. Only about 17% of B.C. youth directly enter university, which is 5% below the Canadian average (Statistics Canada, 2010). However, the lower than average direct-entry university enrolments do not seem to translate into greater support for the trades. Research conducted by the B.C. Business Council (2003) and Taylor (2007) indicated that while B.C. parents are open to the idea of non-university pursuits, they do not see trades as a viable option for their children and therefore the Council recommends increased marketing of trades certification to parents.

The B.C. Business Council report (2003) showed that the labour market in B.C. has suffered slightly due to insufficient levels of educational attainment in B.C.'s population. According to 2001 Census data, 56.4% of B.C.'s working-age population have received a post secondary credential. Of those: 13.8% had a trade school certificate, 18.7% had a completed a college education and 23.9% held a university degree (Business Council of British Columbia, 2003). Currently in B.C., 29% of job openings require a university degree and approximately 44% require other post-secondary training such as apprenticeship, a college diploma or other career-based training. The educational attainment shortfall of roughly 5% in jobs where a university degree was required and jobs where some other post-secondary education was required is about the same found for direct university entry of B.C. high school students compared to the Canadian average (Business Council of British Columbia 2003).

Over the past four decades, the B.C. education system has introduced several vocational initiatives to provide students with multiple graduation pathways. In 1979, the B.C. Ministry of Education introduced Career Programs into high schools, which was an initiative to encourage

smoother transitioning of secondary school students into the trades. Career Preparation programs provided grade 12 students with entry-level skills required for apprenticeship occupations. Taylor (2007) reported that between 1980 and 1997, high school Career Preparation grew from 28 to 2,454 programs. Its focus widened to include other vocational pathways such as business, sales and service, finance and administration and primary industry. Although Career Preparation programs still exist, program support funding was cut by the government in 2001, which drastically reduced the number of programs offered around the province and therefore the rate of student participation (Taylor, 2007).

The Secondary School Apprenticeship (SSA) program was introduced by the Ministry of Education in the early 1990s and aided students in the transition from school to work. SSA students can gain credits towards graduation by working part-time as registered apprentices. SSA is similar to the STAR program in New Zealand although SSA is limited to the trades. The growth of SSA was fairly steady through the 1990s when the Ministry of Education provided funding to school districts to administer the program. When supplementary government funding for SSA was cut in 2001 it caused a dip in enrolment for a year or two in most school districts before participation rates continued to grow steadily to the current 1,824 students active in the program in 2009 (Industry Training Authority of British Columbia, 2009).

The SSA and Career Preparation programs became part of the government's education restructuring efforts in the early '90s. At that time, policy makers advocated for a conceptual merging of academic and vocational traditions in public school and higher education. This strategy strengthened links and transitions between schooling and work, and opened more doors to college and university (Lackey, 2004). Taylor (2007) found the restructuring of the education system resulted in increased connection between educational institutions, expanded access to

post-secondary education, and widened the focus on career-oriented programs. High school reforms included (a) mandatory career planning programs for high school students, (b) opportunities to gain credit towards apprenticeship and technical training while still in high school, (c) alternative programs to keep students in school, and (d) the development of Web-based career technologies.

The Ministry of Education introduced Cooperative Education Programs (Co-op) in 1996, which were integrated into career programs, but were less specialized than Career Preparation programs. The aim was to provide students with relevant work experience, and support their transition to work. In an overview of high school vocational initiatives, Taylor (2007) reported that by 1997-1998 there were 2,243 students in Co-op (Hutchinson, Leonard, Ravening, & Semple, 2005; Taylor, 2007). In recent years, Work Experience (WEX) courses, which are a key component of both Career Preparation and Co-op programs, have declined from 18,233 in 2001-2002 to 14,327 in 2004-2005 (a 21% decrease). Taylor (2007) attributed the 21% enrolment drop to the loss of Career Preparation program funding in 2001.

In another restructuring effort to allow students more education pathway options without limiting access to university, the Ministry of Education introduced the Applied Academics stream to B.C. secondary schools in 1997. The applied academic English, math and physics courses were designed to be acceptable pre-requisite courses at a variety of post-secondary institutions, including university. The intention of Applied Academic courses was to make the high school academic track more flexible, allowing students to select a mix of courses that would best fit their career and educational goals in non-university pathways but still allow them to qualify for university entrance. Resistance from universities to accept Applied Academic as prep courses has limited their effectiveness as a transitioning tool (Taylor, 2007).

To assist in student transition and promote collaboration between the K-12 system and post-secondary systems in B.C., the government offered funding for Career and Technical Centres (CTCs) in the mid 1990s. CTCs were joint operations between school districts and colleges to allow students to earn both a secondary graduation and post-secondary certificate in a broad range of trades and technology areas. A key transition success factor with the CTC model was that the government allowed students to obtain dual credit for courses in secondary schools and post-secondary institutions (Taylor, 2007). This joint operation is similar to the STAR program in New Zealand where students begin post-secondary programming in high school and complete these programs in the post-secondary institute after graduation from high school.

Although CTCs continue to operate in B.C., success has been limited because of funding issues and low enrolments due to a lack of CTC programming promotion in secondary schools. Taylor (2007) noted that teachers, and in particular technology education teachers, are sometimes reluctant to encourage students to enrol in college CTC programs because they generally lose their most capable students and courses can be cancelled due to insufficient enrolment.

In 2004, the B.C. Ministry of Education introduced a new graduation program which maintains high standards for graduation but offers students more choice and gives schools, boards and authorities greater autonomy and flexibility to innovate (B.C. Government, 2008; Business Council of British Columbia, 2003). Taylor (2007) reported that two components of the 2004 graduation program examine and promote student transitions. Planning 10 is a mandatory course in which 70% of the curriculum concerns career development and education planning. B.C.'s grade 10-12 courses are organized into eight focus groups by area of interest (including trades and technology) to encourage student transition to a career pathway.

The 2004 grad program has created an environment in the K-12 system where transition initiatives such as dual credit programming can flourish because the number of compulsory courses has been reduced. This initiative has increased the number of elective courses students can take in their grade 11 and 12 years, allowing students more flexibility and the opportunity to participate in vocational career development courses and programs.

In 2005, the Ministry of Education, in partnership with the ITA, launched a second youth apprenticeship program called Accelerated Credit Enrolment in Industry Training (ACE IT) to complement the SSA program. ACE IT is funded by the ITA and is a dual credit program in which high school students obtain Level One technical training (or its equivalent) in a recognized Red Seal or B.C. trade as part of their graduation course work. The ITA provides school districts and private school board authorities with up to \$2,000 per student. The funding formula gives an initial payment of \$1,000 for each student registered in a technical training program that leads to Level One (or equivalent) certification. A second \$1,000 is paid for each successful Level One or trade credential (Industry Training Authority of British Columbia, 2009a). The splitting of funding in this manner encourages school districts to screen, prepare and support students so they successfully complete their technical training programs. ACE IT completion rates have been encouraging, averaging 76% between 2006-2009 (Industry Training Authority of British Columbia, 2009a).

The structure and delivery of ACE IT programs are flexible and allow school districts and their post-secondary technical training partners to adapt delivery models in various ways to meet local needs. The ITA (2009) has identified several ACE IT delivery models that are being used:

- Program is delivered by a post-secondary institution on campus or on a school district site;
- Both the post-secondary institution and the school district deliver part of a program;
- School district delivers the whole program under the post-secondary partner's supervision; and
- School districts become designated to offer ACE IT programs themselves without a post-secondary partner. (Industry Training Authority of British Columbia, 2009)

Post-secondary delivery is the most common ACE IT model. Over 70% of ACE IT students go to local post-secondary training providers and take pre-apprenticeship programs that have Level One apprenticeship training for one or sometimes two trades as part of the prescribed learning outcomes (Industry Training Authority of British Columbia, 2009a). ACE IT and Career and Technical Centre programming is similar to New Zealand's STAR program because it allows students to begin post-secondary while in high school. The course work is recognized for high school graduation.

Students in SSA and students not registered in an apprenticeship may participate in an ACE IT program. ACE IT gives students who do not have an apprenticeship sponsor–employer the opportunity to gain skills, knowledge and recognized credentialing in a chosen trade. This program makes them more marketable as an apprentice as they move to the workforce after graduation. To help students gain valuable industry experience that can lead to a sponsor–employer, the ITA provides school districts with up to \$750 additional funding per ACE IT student for 240 hours of relevant work-based training (WBT) under the supervision of a qualified journeyman. This extra funding allows students to gain some industry experience and gives

employers a chance to screen potential apprentices (Industry Training Authority of British Columbia, 2009a).

ACE IT programming generally requires school districts, post-secondary training providers (usually public colleges) and local industry to work together, which strengthens the transition process to post-secondary institutions and the workforce. Participation in both the ACE IT and SSA programs encourages students to start a career in the trades, which shortens and smoothes the transition process and makes it more transparent. ITA apprenticeship statistics show that 18 months after graduation, students who have completed both ACE IT and SSA have a continuation rate of over 70%, compared to roughly 40% for students who took one of the youth apprenticeship programs (ITA, 2009). McCrea and Phillips (2007) reported other evidence for the success of youth apprenticeship programs. They interviewed staff in school districts that claimed increased student retention rates because of ACE IT and SSA. One school district's ACE IT program completion rates were higher than the same foundation programs offered to adults by the partner technical training institution at its main campus. Both the instructors and the school district staff attribute the higher ACE IT completion rates to the student support services provided by schools, parental support, and increased instructional time (Silva & Phillips, 2009; Vaughan & Boyd, 2005).

The literature reviewed for this project indicates high school transition programs like SSA and ACE IT improve student retention, graduation rates, and transitions to the workforce and the post-secondary education system. Increased involvement by education and employer stakeholders helps to increase the alignment of educational programming and the skill demands of industry. It supplies employers with the skilled and knowledgeable employees they need to be competitive in the marketplace.

Preparing high school students for success in vocational transition programs has been largely overlooked. It is apparent that current VET programming at the high school level for apprenticeship pathways suffers from a lack of research and data. Until recently, “New Zealand has lacked an overall strategy for transition and related mechanisms for data collection about the transition experiences of young people” (Vaughan, 2005, p. 116). Effective vocational transition policy development in England has been hampered because “there is relatively little known about the patterns of progression of young people on vocational courses. Policy development also suffers from a lack of information and normative expectations about standards” (Green & Evans, 2005, p. 165). A CPRN Pathways study on Canadian high school apprenticeship programs pointed out that few provinces collect information about program outcomes; enrolment information is not readily available or easily comparable across jurisdictions (Taylor, 2007). In a CPRN study (2005) looking at educational pathways to reduce drop-out rates in Canada’s academically biased systems, De Boucker (2005) concluded that it is essential for Canadians to recognize that educators, employers and governments are falling short in preparing appropriate pathways (except for university) from school-to-work for young people. De Boucker noted the lack of a comprehensive review of vocational programs and recommended that Canada develop its own way of delivering high value vocational programming through high school to provide real skilling choices to young Canadians.

In B.C., Taylor (2007) noted that the lack of high school apprentice and educational data for high school apprenticeship programs (SSA and ACE IT) is caused by limitations in the apprenticeship data system.

Since 2007, the ITA has collected SSA and ACE IT registrants’ Personal Education Numbers (PENs), which are unique to each student and assigned for life. PENs are used in both

the K-12 and tertiary systems in B.C. and a 2009 Information Sharing Agreement between the ITA and the B.C. Ministry of Education makes it possible to access many K-12 educational records of registered apprentices, including those who have participated in the SSA and ACE IT high school apprenticeship programs. The intention of this project is to gain some fundamental insights on youth apprentices and their education backgrounds and achievements. Data from this empirical study will provide a basis for future government transition policy and K-12 transition programming for students in apprenticeship pathways.

Methodology

An information sharing agreement between the Industry Training Authority (ITA) and the B.C. Ministry of Education allows, for the first time, the collection of apprenticeship and educational records of B.C. apprentices for comparison.

The purpose of this project is to compare (a) the apprenticeship and secondary school records of those people in B.C. who started an apprenticeship while enrolled in secondary school (focus group) to (b) those who began their apprenticeship after leaving high school (comparison group). 22,909 subjects for this project were selected from the cohort of 60,000 formally registered as apprentices in B.C. with the Industry Training Authority (ITA) between February 2005 and December 2009.

Focus and Comparison Groups

- The focus group is comprised of 13,357 secondary school students registered with the ITA between February 2005 and December 2009 as a youth apprentice in one or both youth apprenticeship programs: Secondary School Apprenticeship (SSA) and Accelerated Credit Enrolment in Industry Training (ACE IT).
- The comparison group of 9,552 were also registered as apprentices with the ITA between February 2005 and December 2009, but did not participate in either of the youth apprenticeship programs (SSA, ACE IT). To limit and/or control the independent variables in the comparison group subjects were selected when possible to match the focus group using the following criteria: trade, age, gender and aboriginal numbers.

Data Sources

The Ministry of Education provided subject demographic information and grade 11 and 12 academic records; the ITA supplied subject demographic information and apprenticeship records. After the focus and comparison groups were selected from the 60,000 apprentice records supplied from the ITA's database, education records for the 22,909 subjects were then supplied by the Ministry of Education's Student Transition Project Department using a combination Personal Education Numbers (PENs) and student names and birth dates as identifiers.

Data Validity and Reliability

Industry Training Authority apprenticeship and Ministry of Education student records were cleaned of erroneous, incomplete and duplicate data. Individual apprenticeship and education records were anonymized by a unique identifier number by ITA research and Ministry of Education Student Transitions Project staff. The anonymized data from both sources was then imported into Excel spreadsheets and supplied to the author.

Apprenticeship data supplied by the Industry Training Authority and education data supplied by the B.C. Ministry of Education were combined to show all apprenticeship and educational records for each individual on a single spreadsheet line. To condense the 4,090 unique course codes found in the academic records, courses were categorized into 63 course/subject headings, which were placed into seven general subject areas. The seven subject areas were derived by the author, an experienced B.C. secondary school teacher. The courses used in each of the seven subject areas are the same for the focus, comparison and provincial groups. See Appendix 5 for a complete list of courses and subject area composition.

Grade Point Averages (GPA) for all data including the Ministry of Education Data is calculated converting letter grades using the following scale: A = 4.0, B = 3.0, C+ = 2.3, C = 2.0, C- = 1.7, F = 0 (SG marks are not included in any GPA calculations). The GPA conversion scale used in this study differs from conversion scale used by the Ministry of Education (A = 4, B = 3, C+ = 2.5, C = 2, C- = 1, F = 0). The Ministry of Education conversion scale was not available to the author until after GPA calculations. However the GPA calculations in this study are valid because all letter grades converted including those from the Ministry of Education used the same conversion scale.

The Ministry of Education's six-year completion graduation rate was used for this study. However, due to limitations of the Ministry of Education data used in this study, the six-year completion graduation rate could not be determined within six years after a student started grade eight as it is in the Ministry's statistics. Instead the focus and comparison group's six-year completion graduation rate was determined using the student's birth date and the year the student graduated. If the student graduated in or before their 20th birthday, they were counted as a six-year completion rate graduate statistic. The limitation of this calculation method is it will not count students that did not enter grade eight in their 13th year. Therefore, any focus or comparison group subjects that were held back a year for any reason prior to grade eight will not be counted in the six year completion graduation rate, but could be included in the Ministry of Education statistics.

All focus group course counts statistics (including the 5 trade analysis statistics) are incomplete. 2990 (22.4%) of the subjects in the focus group (1838 (23.3%) in the five trades

analysis) are still attending secondary school. Focus group graduation statistics have been adjusted to only include subjects eligible for graduation.

Research Design and Procedures

The project questions about focus and comparison group composition, subject selection, achievement and graduation rates are answered using descriptive methods. Quantitative data collected for this project from the Industry Training Authority and the B.C. Ministry of Education records were selected and compiled into categories to aid in answering the project questions:

- What are the Demographics of the subjects in this study?
- What grade 11 and 12 course work (within 7 subject areas) did subjects in this study select?
- What were the subject area and overall combined grade point averages for subjects in this study? and
- What are the graduation rates of the subjects in this study?

Provincial apprenticeship and education statistics supplied by the Industry Training Authority and the Ministry of Education were also used to compare focus and comparison group data to provide a wider context for the study's findings.

Results

Apprenticeship statistics and education data specific to grade 11 and 12 graduation programming will be presented for the focus and comparison groups. The data presented will be: group composition, subject selection combined grade point averages and graduation rates. Where feasible, focus and comparison group data are compared to provincial and federal apprenticeship statistics and B.C. Ministry of Education provincial data to provide context.

The first section will present the focus and comparison groups as a whole. The second section will present data for the cohorts of five of the most popular trades as selected by the focus and comparison groups: automotive service technician, carpenter, construction electrician, hairstylist and professional cook.

Focus and Comparison Group Analysis

Table 2a. Focus and Comparison Group Apprenticeship Statistics

Apprenticeship Group	Group Total	Male	Female	Average Birth Year	Average Start Age of Apprenticeship	Average Apprenticeship Start Year	Apprenticeship Status: Active	Apprenticeship Status: Terminated	Apprenticeship Status: Complete*
Focus Group	13,357	78.4% (10475)	21.6% (2882)	1990	16.7	2007	68.5% (9146)	30.9% (4132)	0.5% (77)
Comparison Group	9,552	88.5% (8461)	11.5% (1091)	1983	23.2	2006.5	71.1% (6796)	21.6% (2068)	7.2% (688)

*Many apprentices will not have completed their apprenticeships within the data collection period and this will be more pronounced in the apprenticeship completion rate because many were still in secondary school.

Table 2b. 2011 Provincial Apprenticeship Statistics

Apprenticeship Group	Total in Group	Male	Female	Average Birth Year	Average Start Age of Apprenticeship	Average Apprenticeship Start Year	Apprenticeship Status: Active	Apprenticeship Status: Terminated	Apprenticeship Status: Complete*
Provincial Statistics (March 2011)	32,396	88.7%	10.1%	1984	25.4	2009.6	32,396	-	40% average

Table 3. Focus and Comparison Group Male and Female Top 10 Ranked Trades

Focus Group					Comparison Group				
Gender	Trade Name	Count	% of Total	Rank	Gender	Trade Name	Count	% of Total	Rank
F	Hairstylist *	1346	46.70%	1	F	Professional Cook*	210	19.27%	1
F	Professional Cook*	828	28.73%	2	F	Hairstylist*	194	17.80%	2
F	Carpenter*	95	3.30%	3	F	Construction Electrician*	114	10.46%	3
F	Automotive Service Technician*	88	3.05%	4	F	Carpenter*	100	9.17%	4
F	Baker	75	2.60%	5	F	Cabinetmaker	49	4.50%	5
F	Dairy Production Technician 1	74	2.57%	6	F	Baker	37	3.39%	6
F	Production Horticulturist	55	1.91%	7	F	Residential Framing Technician	33	3.03%	7
F	Construction Electrician*	38	1.32%	8	F	Landscape Horticulturist	32	2.94%	8
F	Welder – Level C	35	1.21%	9	F	Automotive Service Technician*	31	2.84%	9
F	Cabinetmaker	23	0.80%	10	F	Welder	31	2.84%	9

Gender	Trade Name	Count	% of Total	Rank	Gender	Trade Name	Count	% of Total	Rank
M	Carpenter*	2159	20.61%	1	M	Carpenter*	2019	23.86%	1
M	Professional Cook*	1381	13.18%	2	M	Automotive Service Technician*	885	10.46%	2
M	Automotive Service Technician*	1067	10.19%	3	M	Construction Electrician*	824	9.74%	3
M	Construction Electrician*	849	8.11%	4	M	Professional Cook*	522	6.17%	4
M	Welder – Level C	650	6.21%	5	M	Plumber	487	5.76%	5
M	Plumber	477	4.55%	6	M	Heavy Duty Equipment Technician	326	3.85%	6
M	Heavy Duty Equipment Technician	352	3.36%	7	M	Welder	259	3.06%	7
M	Welder	303	2.89%	8	M	Truck and Transport Mechanic	221	2.61%	8
M	Cabinetmaker	254	2.42%	9	M	Residential Framing Technician	212	2.51%	9
M	Metal Fabricator	209	2.00%	10	M	Cabinetmaker	208	2.46%	10
M	Hairstylist *	44	0.42%	29	M	Hairstylist*	22	0.26%	40

*Trades selected for further analysis

Table 4. Provincial, Focus and Comparison Group Composition by Ministry of Education Designation

Group Composition					
	Public Schools	Independent Schools**	Aboriginal*	ESL*	Special Needs*
Focus Group (13,357)	97.7% (13,010)	2.3% (308)	11.4% (1525)	0.6% (74)	12.3% (1638)
Comparison Group (9,552)	96% (9138)	4% (387)	5.9% (565)	1.1% (105)	6.7% (639)
B.C. (2010-2011 statistics)	88%	12%	10.40%	9.80%	7.40%

*Some subjects may have been recorded in more than one designation

**Does not include out-of-province schools issuing B.C. graduation credentials

Figure 1. Focus and Comparison Group Composition Graphs by Ministry of Education Designation

Note: Some students may have more than one Ministry of Education designation

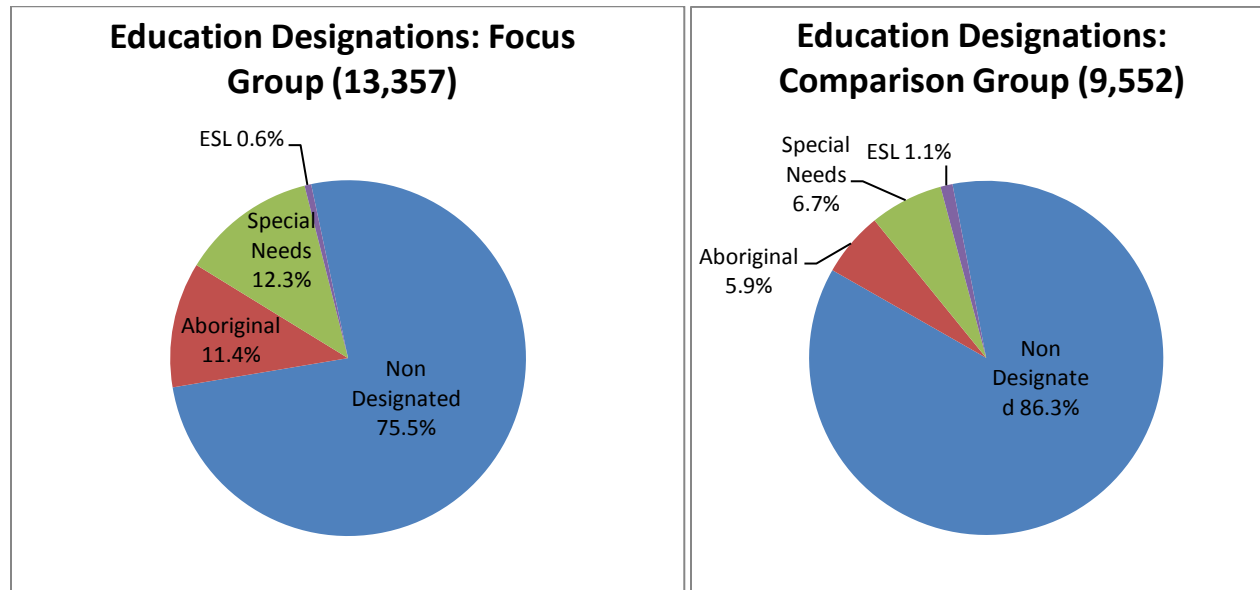


Table 5. Provincial, Focus and Comparison Group Grade11-12 Subject Selection

Subject Area**	Focus Group*			Comparison Group			B.C. Average 2008-2010	
	Course Count	% of Total	Average # Courses/ Apprentice	Course Count	% of Total	Average # Courses/ Apprentice	Course Count	% of Total
Careers***	17167	14.90%	1.29	6942	8.40%	0.73	124243	2.30%
Applied Skills	11477	10.00%	0.86	7689	9.30%	0.80	314058	5.80%
Math	24222	21.10%	1.81	18451	22.20%	1.93	547520	10.10%
Sciences	11621	10.10%	0.87	8907	10.70%	0.93	1168981	21.50%
Language Arts	34960	30.40%	2.62	24754	29.80%	2.59	2281157	41.90%
Humanities	10946	9.50%	0.82	10590	12.70%	1.11	515951	9.50%
Fine Arts	4609	4.00%	0.35	5785	7.00%	0.61	491304	9.00%
Totals	115002	100.00%	8.61	83118	100.00%	8.70	5443214	100.00%

*Focus group course count data is incomplete, 22.4% (2990) of the subjects are still attending secondary school

**See Appendix 5 for a complete list of courses included in each subject area.

***Includes Planning 10 for Focus Group which is comparable to CAPP 11 for Comparison Group.

Table 6. Provincial, Focus and Comparison Groups Grade 11-12 Combined Grade Point Averages (CGPA) (Scale 0-4)

Subject Area	Focus Group CGPA	Comparison Group CGPA	Provincial CGPA 2008-2010
Careers	3.19	2.88	3.01
Applied Skills	2.82	2.67	2.78
Mathematics	2.37	2.22	2.85
Sciences	2.40	2.30	2.88
Language Arts	2.33	2.22	2.84
Humanities	2.00	1.99	2.86
Fine Arts	2.83	2.80	3.11
Group Average	2.56	2.44	2.90

Table 7a. Provincial Six-Year Completion Grade 12 Graduation Rates

Group	Male	Female	Aboriginal*	ESL*	Special Needs*	Overall
Focus Group**	78.0%	72.6%	59.2%	57.8%	67.3%	77.0%
Comparison Group**	77.9%	81.5%	62.9%	60.7%	79.5%	78.2%
B.C. Average 2008-2010	76.5%	82.9%	48.2%	82.1%	45.4%	79.6%

*Some subjects may have been recorded in more than one designation

**Data only shown for apprentices under 20 years old that qualified for six-year completion gr. 12 graduation

Table 7b. Focus and Comparison Group Six-Year Completion Grade 12 Graduation Rates

Focus Group*: six-year Completion Gr.12 Graduation Rate by Birth Year	Focus Group* Total		Male		Female		Aboriginal**		ESL**		Special Needs**	
	1990	2328/2976	78.2%	1855/2324	79.8%	473/652	72.5%	205/343	59.8%	9 /11	81.8%	246/361
1989	1942/2547	76.3%	1555/2013	77.2%	387/534	72.3%	171/285	60.0%	5 /12	41.7%	210/311	67.7%
1988	1452/1885	77.0%	1227/1572	78.0%	225/313	71.9%	120/199	60.3%	6 /11	54.5%	154/222	69.4%
1987	822/1096	75.0%	681/906	75.2%	141/190	74.2%	72/133	54.1%	6 /11	54.5%	86/139	61.9%
Totals and Averages	6544/8504	77.0%	5318/6815	78.0%	1226/1689	72.6%	568/960	59.2%	26/45	57.8%	696/1033	67.3%
Comparison Group: Six Year Completion Gr.12 Graduation Rate by Birth Year	Comparison Group Total		Male		Female		Aboriginal**		ESL**		Special Needs**	
	1985	1100/1337	82.3%	923/1128	81.8%	177/209	84.7%	50/84	59.5%	6/8	75.0%	84/100
1984	1864/2294	81.2%	1680/2082	80.7%	184/212	86.8%	102/146	69.9%	3/18	16.7%	153/182	84.1%
1983	1682/2108	80.9%	1547/1942	79.7%	135/166	81.3%	75/109	68.8%	9/15	60.0%	144/180	80.0%
1982	1201/1573	76.3%	1098/1438	76.4%	102/135	75.5%	45/86	52.3%	9/14	64.3%	95/124	76.6%
1981	704/956	73.6%	617/853	72.3%	86/103	83.5%	25/48	52.1%	15/18	83.3%	19/33	57.6%
1980	446/674	66.2%	382/580	65.9%	65/94	69.1%	27/42	64.3%	12/16	75.0%	5/10	50.0%
Totals and Averages	6997/8942	78.2%	6247/8023	77.9%	749/919	81.5%	324/515	62.9%	54/89	60.7%	500/629	79.5%

*Focus group graduation data only includes subjects that were eligible for graduation, 22.4% (2990) of the subjects are still attending secondary school and were too young to graduate.

**Some subjects may have been recorded in more than one designation.

Five Selected Trades Analysis

Table 8. Top 10 Trade Categories by New Registrations in Canada (2008)

Rank	Trade Category	New Apprenticeship Registrations 2008
1	Electricians	58,158
2	Carpenters	51,390
3	Automotive Service	44,007
4	Plumbers, Pipefitters and Steamfitters	38,562
5	Welders	18,030
6	Hairstylists and Estheticians	18,006
7	Interior Finishing	17,553
8	Food Service	15,015
9	Exterior Finishing	13,743
10	Heavy Duty Equipment Mechanics	12,492

(Canadian Apprenticeship Forum, 2010)

Table 9. Five Selected Trades Group Composition by Gender

Analysis Trade	Focus Group				Comparison Group				Total Count
	Female Count	%	Male Count	%	Female Count	%	Male Count	%	
Automotive Service Technician	88	3.1%	1067	10.2%	31	2.8%	885	10.5%	2071
Carpenter	95	3.3%	2159	20.6%	100	9.2%	2019	23.9%	4373
Construction Electrician (Electrician)	38	1.3%	849	8.1%	114	10.5%	824	9.7%	1825
Hairstylist (Cosmetologist)	1346	46.7%	44	0.4%	194	17.8%	22	0.3%	1606
Professional Cook	828	28.7%	1381	13.2%	210	19.3%	522	6.2%	2941
Totals	2395	83.1%	5500	52.5%	649	59.6%	4272	50.6%	12816

Table 10. Five Selected Trades Group Composition by Ministry of Education Designation

Focus Group		Public Schools		Independent Schools		Aboriginal*		ESL*		Special Needs*	
Trade Name	Total Count	Count	%	Count	%	Count	%	Count	%	Count	%
Automotive Service Technician	1155	1118	96.8%	37	3.2%	115	10.0%	8	0.7%	117	10.1%
Carpenter	2254	2206	97.9%	48	2.1%	276	12.2%	5	0.2%	297	13.2%
Construction Electrician	887	868	97.9%	19	2.1%	66	7.4%	5	0.6%	58	6.5%
Hairstylist	1390	1380	99.3%	10	0.7%	189	13.6%	10	0.7%	140	10.1%
Professional Cook	2209	2191	99.2%	18	0.8%	378	17.1%	21	1.0%	329	14.9%
Total	7895	7763	98.2%	132	1.8%	1024	12.1%	49	0.6%	941	11.0%
Comparison Group		Public Schools		Independent Schools		Aboriginal		ESL		Special Needs	
Trade Name	Total Count	Count	%	Count	%	Count	%	Count	%	Count	%
Automotive Service Technician	1009	958	94.9%	51	5.1%	32	3.2%	38	3.8%	68	6.7%
Carpenter	2467	2343	95.0%	124	5.0%	175	7.1%	10	0.4%	203	8.2%
Construction Electrician	986	945	95.8%	41	4.2%	27	2.7%	4	0.4%	41	4.2%
Hairstylist	257	246	95.7%	11	4.3%	18	7.0%	7	2.7%	14	5.4%
Professional Cook	818	779	95.2%	39	4.8%	89	10.9%	21	2.6%	58	7.1%
Total	5537	5271	95.3%	266	4.7%	341	6.2%	80	2.0%	384	6.3%

*Some subjects may have been recorded in more than one designation

Table 11. Five Selected Trades Focus and Comparison Group Apprenticeship Status

Focus Group							
Trade Name	Total Count	Apprenticeship Status Active	<i>Apprenticeship Status Active</i> %	Apprenticeship Status Terminated	<i>Apprenticeship Status Terminated</i> %	Apprenticeship Status Certified	<i>Apprenticeship Status Certified*</i> %
Automotive Service Technician	1155	864	74.8%	291	25.2%	0	0.0%
Carpenter	2254	1486	65.9%	765	33.9%	3	0.1%
Construction Electrician	887	756	85.2%	129	14.5%	2	0.2%
Hairstylist	1390	939	67.6%	451	32.4%	0	0.0%
Professional Cook	2209	1445	65.4%	756	34.2%	8	0.4%
Totals and Averages	7895	5490	69.5%	2392	30.3%	13	0.2%
Comparison Group							
Trade Name	Total Count	Apprenticeship Status Active	<i>Apprenticeship Status Active</i> %	Apprenticeship Status Terminated	<i>Apprenticeship Status Terminated</i> %	Apprenticeship Status Certified	<i>Apprenticeship Status Certified*</i> %
Automotive Service Technician	1009	786	77.9%	139	13.8%	84	8.3%
Carpenter	2467	1762	71.4%	617	25.0%	88	3.6%
Construction Electrician	986	806	81.7%	147	14.9%	33	3.3%
Hairstylist	257	110	42.8%	140	54.5%	7	2.7%
Professional Cook	818	540	66.0%	205	25.1%	73	8.9%
Totals and Averages	5537	4004	72.3%	1248	22.5%	285	5.1%

*Focus Group apprentices will not have completed their apprenticeships within the data collection period and this will be more pronounced in the apprenticeship certification rates because many were still in secondary school.

Table12: Five Selected Trades Focus* and Comparison Group Grade11-12 Subject Selection**

Trade and Group	Gender	Career Course Count***	% of total Courses	Applied Skills Course Count	% of total Courses	Math Course Count	% of total Courses	Sciences Course Count	% of total Courses	Language Arts Course Count	% of total Courses	Humanities Course Count	% of total Courses	Fine Arts Course Count	% of total Courses	Total Course Count	Courses per Student
Automotive Service Technician																	
FOCUS	F	169	19.10%	172	19.50%	91	10.30%	98	11.10%	150	17.00%	140	15.80%	64	7.20%	884	5.2
FOCUS	M	2245	20.70%	2609	24.00%	1105	10.20%	1203	11.10%	1825	16.80%	1420	13.10%	451	4.20%	10858	4.8
Automotive Service Technician : Focus Group		2414	19.90%	2781	21.70%	1196	10.20%	1301	11.10%	1975	16.90%	1560	14.50%	515	5.70%	11742	4.9
COMP	F	41	10.40%	119	30.20%	38	9.60%	25	6.30%	60	15.20%	69	17.50%	42	10.70%	394	9.6
COMP	M	1247	10.80%	3749	32.60%	1176	10.20%	868	7.50%	1743	15.20%	1784	15.50%	937	8.10%	11504	9.2
Automotive Service Technician : Comparison Group		1288	10.60%	3868	31.40%	1214	9.90%	893	6.90%	1803	15.20%	1853	16.50%	979	9.40%	11898	9.2
Carpenter																	
FOCUS	F	176	19.20%	193	21.10%	96	10.50%	89	9.70%	164	17.90%	130	14.20%	68	7.40%	916	5.2
FOCUS	M	4271	19.50%	5478	25.10%	2325	10.60%	2192	10.00%	3739	17.10%	2774	12.70%	1088	5.00%	21867	5.1
Carpenter: Focus Group		4447	19.40%	5671	23.10%	2421	10.60%	2281	9.90%	3903	17.50%	2904	13.40%	1156	6.20%	22783	5.1
COMP	F	148	11.80%	301	23.90%	136	10.80%	91	7.20%	198	15.70%	237	18.80%	147	11.70%	1258	8.5
COMP	M	2764	11.00%	7679	30.50%	2563	10.20%	1620	6.40%	3913	15.50%	4264	16.90%	2368	9.40%	25171	9.1
Carpenter: Comparison Group		2912	11.40%	7980	27.20%	2699	10.50%	1711	6.80%	4111	15.60%	4501	17.90%	2515	10.50%	26429	9.1
Construction Electrician																	
FOCUS	F	76	17.60%	55	12.80%	51	11.80%	65	15.10%	74	17.20%	75	17.40%	35	8.10%	431	5.7
FOCUS	M	1916	20.20%	1728	18.20%	1107	11.70%	1330	14.00%	1556	16.40%	1335	14.10%	526	5.50%	9498	5.0
Construction electrician: Focus Group		1992	18.90%	1783	15.50%	1158	11.70%	1395	14.50%	1630	16.80%	1410	15.70%	561	6.80%	9929	5.0
COMP	F	159	11.20%	349	24.50%	152	10.70%	120	8.40%	218	15.30%	279	19.60%	146	10.30%	1423	8.9
COMP	M	1174	11.00%	2967	27.70%	1234	11.50%	867	8.10%	1636	15.30%	1858	17.40%	958	9.00%	10694	9.1
Construction electrician: Comparison Group		1333	11.10%	3316	26.10%	1386	11.10%	987	8.30%	1854	15.30%	2137	18.50%	1104	9.60%	12117	9.1

Hairstylist																	
FOCUS	F	3164	27.00%	1315	11.20%	1183	10.10%	1087	9.30%	2258	19.30%	1803	15.40%	901	7.70%	11711	3.7
FOCUS	M	94	24.80%	52	13.70%	42	11.10%	33	8.70%	66	17.40%	57	15.00%	35	9.20%	379	4.0
Hairstylist: Focus Group		3258	25.90%	1367	12.50%	1225	10.60%	1120	9.00%	2324	18.30%	1860	15.30%	936	8.50%	12090	3.7
COMP	F	295	12.70%	654	28.20%	204	8.80%	95	4.10%	378	16.30%	428	18.60%	266	11.50%	2320	7.9
COMP	M	32	11.90%	71	26.40%	31	11.50%	13	4.80%	47	17.50%	46	17.60%	29	10.80%	269	8.4
Hairstylist: Comparison Group		327	12.30%	725	27.30%	235	10.20%	108	4.50%	425	16.90%	474	18.10%	295	11.10%	2589	7.9
Professional Cook																	
FOCUS	F	1940	24.60%	1176	14.90%	804	10.20%	724	9.20%	1415	18.00%	1230	15.60%	591	7.50%	7880	4.1
FOCUS	M	3116	23.50%	2333	17.60%	1354	10.20%	1325	10.00%	2280	17.20%	1982	15.00%	850	6.40%	13240	4.2
Professional Cook: Focus Group		5056	24.10%	3509	16.30%	2158	10.20%	2049	9.60%	3695	17.60%	3212	15.30%	1441	7.00%	21120	4.2
COMP	F	324	12.60%	696	27.00%	248	9.60%	147	5.70%	402	15.60%	480	18.60%	283	11.00%	2580	8.0
COMP	M	758	11.70%	1876	28.90%	670	10.30%	431	6.60%	1008	15.50%	1145	17.60%	609	9.40%	6497	8.6
Professional Cook: Comparison Group		1082	12.10%	2572	27.90%	918	10.00%	578	6.20%	1410	15.50%	1625	18.10%	892	10.20%	9077	8.4

*Focus group course count data is incomplete, 23.3% (1838) of the subjects are still attending secondary school

**See Appendix 5 for a complete list of courses included in each subject area

*** Includes Planning 10 for Focus Group which is comparable to CAPP 11 for Comparison Group.

Table 13. Five Selected Trades Focus and Comparison Group Total and Individual Average Grade 11-12 Course Count

Trade	Focus Group Total Count*	Total Course Count: Focus Group*	Focus Group Average # of Courses per Apprentice*	Comparison Group Total Count	Total Course Count: Comparison Group	Comparison Group Average # of courses per Apprentice
Automotive Service Technician	1155	11742	10.2	1009	11898	11.8
Carpenter	2254	22783	10.1	2467	26429	10.7
Construction Electrician	887	9929	11.2	986	12117	12.3
Hairstylist	1390	12090	8.7	257	2589	10.1
Professional Cook	2209	21120	9.6	818	9077	11.1
Totals/Averages	7895	77664	9.8	5537	62110	11.2

*Focus group course count data is incomplete, 23.3% (1838) of the subjects are still attending secondary school

Table 14a: Five Selected Trades Focus and Comparison Group Combined Grade Point Averages (CGPA) (Scale 0-4)

Focus Group	Careers CGPA	Applied Skills CGPA	Mathematics CGPA	Sciences CGPA	Language Arts CGPA	Humanities CGPA	Fine Arts CGPA	Overall CGPA
Automotive Service Technician	3.21	2.92	2.43	2.41	2.38	2.44	2.72	2.65
Carpenter	3.14	2.77	2.41	2.40	2.30	2.43	2.84	2.61
Construction Electrician	3.33	2.94	2.42	2.64	2.43	2.61	2.88	2.75
Hairstylist	3.18	2.51	2.22	2.04	2.25	2.33	2.94	2.50
Professional Cook	3.13	2.73	2.26	2.35	2.28	2.29	2.77	2.54
Overall Subject CGPA	3.20	2.77	2.35	2.37	2.33	2.42	2.83	2.61
Comparison Group	Careers CGPA	Applied Skills CGPA	Mathematics CGPA	Sciences CGPA	Language Arts CGPA	Humanities CGPA	Fine Arts CGPA	Overall CGPA
Automotive Service Technician	3.01	2.75	2.37	2.35	2.34	2.51	2.86	2.60
Carpenter	2.83	2.71	2.20	2.33	2.19	2.38	2.86	2.50
Construction Electrician	3.31	2.74	2.22	2.47	2.31	2.61	2.86	2.65
Hairstylist	2.43	2.65	2.17	2.12	2.18	2.34	2.75	2.38
Professional Cook	3.06	2.46	2.14	2.21	2.09	2.21	2.70	2.41
Overall Subject CGPA	2.93	2.66	2.22	2.30	2.22	2.41	2.80	2.51

Table 14b. Provincial Statistics: Combined Grade Point Averages (CGPA) (Scale 0-4)

B.C. Gr. 11-12 2008-10 Subject Area CGPA by Gender								
Gender	Careers CGPA	Applied Skills CGPA	Math CGPA	Sciences CGPA	Language Arts CGPA	Humanities CGPA	Fine Arts CGPA	Overall CGPA
Female	3.03	2.83	2.92	2.91	2.90	2.92	3.14	2.95
Male	2.99	2.74	2.78	2.84	2.79	2.80	3.07	2.86
Combined	3.01	2.78	2.85	2.88	2.84	2.86	3.11	2.90

Table 15a. Five Selected Trades: Focus Group Six-Year Completion Grade 12 Graduation Rates

Six-year Grad Rate by Trade: Focus Group*	2009			2008			2007			2006			Overall		
	6-yr grad count	Total eligible	% grad	6-yr grad count	Total eligible	% grad	6-yr grad count	Total eligible	% grad	6-yr grad count	Total eligible	% grad	Total Grad Count	Total Eligible	Average 6-yr Grad %
Automotive Service Technician	210	270	77.8%	162	202	80.2%	107	128	83.6%	63	83	75.9%	542	683	79.4%
Carpenter	401	497	80.7%	350	462	75.8%	304	391	77.7%	147	203	72.4%	1202	1553	77.4%
Construction Electrician	191	212	90.1%	129	149	86.6%	121	130	93.1%	60	70	85.7%	501	561	89.3%
Hairstylist	214	323	66.3%	164	251	65.3%	93	133	69.9%	61	87	70.1%	532	794	67.0%
Professional Cook	370	492	75.2%	276	384	71.9%	197	284	69.4%	120	179	67.0%	963	1339	71.9%

*Focus group data only includes subjects that were eligible for graduation, 23.3% (1838) of the subjects are still attending secondary school and too young to graduate.

Table 15b. Five Selected Trades: Comparisons Group Six-Year Completion Grade 12 Graduation Rates

Six-year Graduation Rate by Trade: Comparison Group	2004			2003			2002			2001			2000			1999			Overall		
	6 yr grad count	total eligible	% grad	6 yr grad count	total eligible	% grad	6 yr grad count	total eligible	% grad	6yr grad count	total eligible	% grad	6 yr grad count	total eligible	% grad	6 yr grad count	total eligible	% grad	Total Grad Count	Total Eligible	Average 6 yr Grad %
Automotive Service Technician	172	225	76.4	162	195	83.1	103	136	75.7	85	133	63.9	83	130	63.8	49	92	53.3	654	911	71.8
Carpenter	439	607	72.3	398	534	74.5	303	424	71.5	236	366	64.5	198	311	63.7	99	181	54.7	1673	2423	69.0
Construction Electrician	18	20	90.0	153	206	74.3	315	390	80.8	237	310	76.5	12	14	85.7	18	26	69.2	753	966	78.0
Hairstylist	42	58	72.4	38	55	69.1	29	48	60.4	18	31	58.1	15	25	60.0	7	20	35.0	149	237	62.9
Professional Cook	119	157	75.8	133	176	75.6	88	132	66.7	68	113	60.2	63	85	74.1	43	85	50.6	514	748	68.7

Data Analysis and Interpretation

The lack of research and data available for secondary school vocational transition programs is apparent (Green & Evans, 2005; Taylor, 2007; Vaughan & Boyd, 2005). The purpose of this project has been to compare (a) the apprenticeship and secondary school records of those people in B.C. who started an apprenticeship while enrolled in secondary school (focus group) to (b) those who began their apprenticeship after leaving high school (comparison group). Subjects for this project were selected from the cohort of 60,000 formally registered as apprentices in B.C. with the Industry Training Authority (ITA) between February 2005 and December 2009. The B.C. Ministry of Education provided educational records for this cohort of 60,000 apprentices. The data from this study may be useful for vocational transition program reforms as part of the B.C. Ministry of Education's personalized education initiative.

The focus group for this project comprised the 13,357 secondary school students that registered with the ITA in one or both youth apprenticeship programs: Secondary School Apprenticeship (SSA) and Accelerated Credit Enrolment in Industry Training (ACE IT). The comparison group of 9,552 who began apprenticeships after leaving secondary school was selected from the remainder of the cohort of 60,000 to match as closely as possible the demographic make-up of the focus group. Comparison group selection criteria included: trade, age, gender and aboriginal status.

Apprenticeship and education statistics from the focus and comparison groups will be compared to each other and to provincial norms. The same analysis will then be done with the cohorts of five of the most popular trades in the second section of this data analysis to expose differences and similarities between the different trades and to the groups as a whole.

Data Limitations

Age.

The age difference between the focus and comparison groups was unavoidable in the selection of subjects for this project. Age was one of the comparison group selection criteria to ensure that the age difference between the focus and comparison groups was kept to a minimum. The fact that the comparison group is older than the focus group may have influenced the project results and therefore needs to be discussed.

The results show the average person in the comparison group started an apprenticeship at the age of 23.2 years, whereas the average person in the focus group started an apprenticeship at 16.7 years of age. Therefore, before starting an apprenticeship, the average comparison group member would have 6.5 more years of life experience to draw from than the average focus group subject. (In addition, four or five of the 6.5 years of this extra life experience would have come after secondary school for the vast majority of the comparison group).

The older average age and extra life experience of the comparison group means the project results for the comparison group may have been positively influenced by a number of associated age factors, including: higher maturity levels, more post-secondary education experience and more employment experience.

Graduation.

Another problem associated with age and the data collection period is that not all students in the focus group had the same amount of time to complete secondary school, which negatively affects focus group graduation rates. Therefore a modified six-year completion graduation rate was

used for both the focus and comparison groups. This modified graduation rate calculation is slightly lower but comparable to the six-year completion graduation rate used by the Ministry of Education. For this data analysis it was not possible to calculate the six-year completion graduation rate based on the Ministry's calculation because that data was not available to the researcher. Rather than checking for graduation six years after a student begins grade 8, graduation was reviewed at the end of each student's 19th year, which would be six years after the natural age of starting grade 8. This method of using age instead of grade to calculate the six year completion window will not include any subjects that were held back a year before grade eight.

2990 (22.4%) of the focus group subjects are still attending secondary school which has effects on the focus group course count statistics. Focus group graduation statistics have been adjusted to only include subjects eligible for graduation.

Self-selection.

The makeup of the focus and comparison groups show signs of a self-selection process that could be attributed to factors associated with the age difference between the two groups. Data from Tables 2a and b (pp.57-8), Focus and Comparison Group Apprenticeship Statistics (in Results), shows 5.9% of the comparison group is aboriginal and 6.7% is special needs. The focus group has 11.4% aboriginal subjects and 12.3% special needs subjects, approximately double the percentage found in the comparison group. When compared to the provincial averages of 10.4% for aboriginal and 7.4% for special needs, the focus group is over-represented and the comparison group is under-represented by both groups. The opposite is true for the English as a Second Language (ESL) cohort of both groups, which are far below the 9.8% provincial average.

Provincial secondary school graduation rates provide some evidence of aboriginal and special needs self-selection. The focus and comparison group aboriginal and special needs graduation rate averages are significantly higher than the provincial average, which indicates there is an over-representation of graduates in both groups.

While self-selection may be a contributing factor to the higher than average graduation rates for the aboriginal and special needs individuals of the focus group, some of the individuals may have been motivated to take a youth apprenticeship program in secondary school as part of an alternate graduation/school completion pathway. Earning extra course credits, however, would benefit students when youth apprenticeship programming facilitated graduation.

Conversely, the reason for the smaller aboriginal and special-needs cohorts of the comparison group might be that people who have not had positive school and/or employment experiences are less likely (without the support of the education system resources and programming) to select a career in the trades.

The under-representation of ESL individuals in both the focus and comparison groups could be attributed to language barriers and cultural biases that make the trades a less desirable career choice.

Finally, the average apprenticeship starting age of the comparison group was 23 (Table 2a), which would mean that most people considering an apprenticeship would have five or six more years of life experience from which to draw on to help them reach a decision. The effect of the comparison group's additional life experience and self-selection is unclear, but should be taken into consideration.

Graduation program differences

The average age of the focus group is 16.7 (Table 2a), which is 6.5 years younger than the average age of the comparison group. The age difference between the focus and comparison groups means the vast majority of subjects in the focus and comparison groups were in different Ministry of Education graduation programs, which affected the total number and type of courses required for graduation.

The focus group is primarily comprised of students who were part of the current graduation program that began in 2004. The 2004 graduation program (B.C. Government, 2011) begins in grade 10 and has a minimum requirement of 80 course credits to graduate. The majority of the comparison group would, however, have been in the B.C. Ministry of Education's 1995 graduation program (B.C. Government, 2011) which began in grade 11 and has a minimum requirement of 52 course credits to graduate.

Table 16. 1995 and 2004 Graduation Program Comparison Table

Graduation Program 1995 Requirements	2004 Requirements - Grade 10, September 2004
CREDIT REQUIREMENTS	
Grades 11-12	Grade 10-12
52 credits (equivalent to thirteen 4-credit courses) required for graduation	80 credits (equivalent to twenty 4-credit courses) required for graduation
28 of 52 credits must be in foundation studies, including:	48 credits are required courses, including:

Language Arts 11 (4 credits) Language Arts 12 (4 credits) Social Studies 11 or B.C. First Nations Studies 12 (4 credits) Mathematics 11 or 12 (4 credits) Science 11 or 12 (4 credits) Fine Arts 11 (2 credits) Applied Skills 11 (2 credits) Career/Personal Planning 11 (2 credits) Career/Personal Planning 12 (2 credits)	Language Arts 10 (4 credits) Language Arts 11 (4 credits) Language Arts 12 (4 credits) Social Studies 10 (4 credits) Social Studies 11 or 12 (4 credits) Science 10 (4 credits) Science 11 or 12 (4 credits) Mathematics 10 (4 credits) Mathematics 11 or 12 (4 credits) Physical Education 10 (4 credits) Fine Arts or Applied Skills 10, 11 or 12 (4 credits) Planning 10 (4 credits)
	4 credits for Graduation Transitions
24 credits in selected studies	28 credits are elective courses
Minimum of 16 credits of ministry developed courses at the grade 12 level, including Language Arts 12 for 4 credits	Minimum of 16 credits at the grade 12 level including Language Arts 12. All Ministry-authorized and Board/Authority-Authorized courses count.
CURRICULUM	
Career and Personal Planning (CAPP)	
To graduate, students must complete four credits in Career and Personal Planning, two in grade 11 and two in grade 12 as part of Foundation Studies	A new Planning 10 four credit course focused on education planning, career development, healthy decision-making, financial literacy and portfolio planning is required. As part of the Planning 10 course, students learn about and consider eight possible Focus Areas.
Students must complete 30 hours of work experience as	Students must complete 30 hours of work experience or

part of the CAPP 11 and 12	community service as part of Graduation Transitions.
Applied Skills and Fine Arts	
To graduate students must complete 2 credits in Applied Skills and two credits in Fine Arts at the grade 11 or 12 level	<p>4 credits required in Fine Arts and/or Applied Skills at any time during grade 10, 11 or 12. This can include 2 credits from each area.</p> <p>Boards and authorities may determine which courses meet these requirements based on Ministry guidelines.</p> <p>Students must be offered choice between the two areas.</p>
Physical Education	
No Graduation Program requirement	<p>Physical Education 10 is required for all students.</p> <p>To graduate, students are also required to meet a provincial standard for physical activity and be assessed in other health related areas as part of Graduation Transitions.</p>
CHOICE AND FLEXIBILITY	
Dual Credit	
Limited dual credit for post-secondary courses to meet graduation requirements	All public post-secondary credits will count towards graduation.
Locally Developed Courses	
Only two locally developed courses (eight credits) can	There will be no limit to the number of Board/Authority-Authorized course credits that count as elective credits

count toward graduation	towards graduation. The ministry will provide standards for development and introduce an approval process.
External Learning Credits	
<p>The current Graduation Program includes options for students to earn grade 11 and 12 credits toward graduation, in addition to school courses through:</p> <ol style="list-style-type: none"> 1) equivalency, 2) external credentials, 3) challenge, and 4) independent directed studies 	<p>Increased options for students to earn grade 10, 11 and 12 credits toward graduation by recognizing other learning opportunities.</p> <p>Planning 10 will promote information about and access to:</p> <ol style="list-style-type: none"> 1) equivalency 2) external credentials, 3) challenge, and 4) independent directed studies <p>Schools will be able to offer students the independent directed studies option to a maximum of 4 credits in each Ministry or Board/Authority-Authorized course.</p>
EXAMS	
Students must take one grade 12 provincial exam-one of four required in Language Arts 12. Their final mark is a blend of school marks and the provincial exam.	<p>Students required to write 5 Graduation Program Exams:</p> <ul style="list-style-type: none"> • Grade 10 Language Arts (20%) • Grade 10 Science (20%) • Grade 10 Mathematics (20%) • Grade 11 or 12 Social Studies (20%) • A grade 12 Language Arts exam (40%)
Classroom mark determines the standard for graduation in all other areas in grade 11.	Graduation Program Exam marks blended with course marks in Language Arts 10, Mathematics 10, Science 10 and Social Studies at the 11 or 12, depending on which course is

	chosen.
Twenty exams serve as tools for post-secondary entrance requirements and exams are mandatory if the course is taken.	Except for the Language Arts 12 exams and B.C. First Nations Studies 12, all other grade 12 exams are optional.

Source: B.C. Government (2011b)

The effect of the graduation program on subject course selection, grade point averages and graduation results is not clear, but must be considered as an influence.

Group Statistics Analysis

Group composition.

Table 17. Apprenticeship Statistics

Apprenticeship Information	Total in Group	Male	Female	Average Birth Year	Average Start Age of Apprenticeship	Average Apprenticeship Start Year
Focus Group	13,357	78.4% (10475)	21.6% (2882)	1990	16.7	2007
Comparison Group	9,552	88.5% (8461)	11.5% (1091)	1983	23.2	2006.5
ITA 2011	32,396	88.7%	10.1%	1984	25.4	2009.6

Table 17 above summarize Result Tables 2a and 2b: Focus and Comparison Group and Provincial Apprenticeship Statistics.

Trades in Canada are male dominated. Statistics Canada (2011) reported that from 2004-2008, an average of 6.9% apprenticeship registrations in B.C. were female (Statistics Canada, 2011). The apprenticeship statistics in Table 17 indicates the female composition of the focus group is 10.1% more than in the comparison group. Several factors may account for the almost double focus group female participation.

The difference in focus and comparison group female participation rates could be due to the fact that the females in the focus group had higher awareness levels of trades as a career and secondary programming option because of the marketing of youth apprenticeship programs by school and district careers staff in career courses like Planning 10.

Higher focus group female participation rates could also be attributed to direct and indirect exposure to youth trades programs in schools. Some secondary schools offer on-campus technical training (ACE IT programs) for traditional female trades such as hairstylist and professional cook as well as non-traditional female trades such as carpentry and automotive service technician. On-campus technical training would raise trades awareness and accessibility for females. Females involved with either of the youth apprenticeship programs (SSA and ACE IT) would talk to their friends and siblings about their apprenticeship experiences, which would raise awareness.

Finally, the ability to begin a career in the trades by taking a work-based training program (SSA) and/or apprenticeship technical training (ACE IT) while in secondary school and have it count as course work towards graduation could have attracted females who were not satisfied with the regular secondary school programming options.

The differences in the most popular trades selected by females in the focus and comparison groups seems to support the rationale (provided above) for higher focus group female participation rates.

Table 18. Female Focus and Comparison Group Top 10 Ranked Trade Selection

Focus Group					Comparison Group				
Gender	Trade Name	Count	% of Total	Rank	Gender	Trade Name	Count	% of Total	Rank
F	Hairstylist	1346	46.70%	1	F	Professional Cook	210	19.27%	1
F	Professional Cook	828	28.73%	2	F	Hairstylist	194	17.80%	2
F	Carpenter	95	3.30%	3	F	Construction Electrician	114	10.46%	3
F	Automotive Service Technician	88	3.05%	4	F	Carpenter	100	9.17%	4
F	Baker	75	2.60%	5	F	Cabinetmaker	49	4.50%	5
F	Dairy Production Technician 1	74	2.57%	6	F	Baker	37	3.39%	6
F	Production Horticulturist	55	1.91%	7	F	Residential Framing Technician	33	3.03%	7
F	Construction Electrician	38	1.32%	8	F	Landscape Horticulturist	32	2.94%	8
F	Welder – Level C	35	1.21%	9	F	Automotive Service Technician	31	2.84%	9
F	Cabinetmaker	23	0.80%	10	F	Welder	31	2.84%	9

Table 18 is a partial summary of Results Table 3: Focus and Comparison Group Male and Female Top 10 Ranked Trades from data in Appendix 4.

Female trade ranking data from the table above indicates that the comparison female group has a fairly even distribution of the four top-ranked trades tapering to the 10th ranked trade compared with the focus group. To put this finding into perspective, 76% of the female comparison group is represented in the top 10 ranked trades, whereas a similar percentage is represented in just the top two ranked trades for the focus group females. Table 18 shows the two most popular trades for both groups are hairstylist and professional cook, which are considered to be traditional female trades. They are seen as socially acceptable and attractive trades for females, which may account in part for the high level of attraction for the focus-group females (Eccles, 1987; Gottfredson, 1981). The focus group participants who started their trades training in secondary school and younger than the comparison group would probably tend to conform to social norms due to less life experience.

The lower number in the comparison group hairstylist cohort may be attributed to the fact that there are credentialing bodies for hairstylists in B.C. other than the ITA, which is the mandatory credentialing body for the focus group cohort. Also Table 11 indicates the comparison group hairstylist cohort has the highest attrition rate (54.5%) of all the comparison group trades in the analysis. This suggests there is a high turnover in this industry which traditionally does not pay well.

The top four ranked trades of the female focus group are the most common technical training programs offered on campus by secondary schools. Professional cook, carpenter and automotive service technician are also high volume trades that generally have more employment opportunities, including apprenticeships. Increased exposure and accessibility to these four trades due to in school training opportunities and the potential of more SSA opportunities may account for the female focus group's participation levels in the non-traditional female trades.

High volume trades dominate the comparison female group top-10 trade ranking. Of these top 10 trades, only hairstylist, professional cook, landscape horticulturalist and baker would be considered traditional or acceptable female trades, but account for only 43% of the female comparison group subjects. Therefore, more than half of the comparison group females chose non-traditional female trades (Eccles, 1987; Gottfredson, 1981). This much higher participation rate in non-traditional female trades may be due to the older average age of the group. They would have had more opportunity to shop around and find an occupation they would like to pursue as well as being more mature, making them less susceptible to conforming to social/cultural norms than the focus group females. Most of the trades in the top 10, however, are high volume trades, which would make it easier to find an apprenticeship and would have influenced the choice of trade for all of the subjects in this study.

Table 19. B.C. Ministry of Education Designations

Group Composition					
	Public Schools	Independent Schools*	Aboriginal**	ESL**	Special Needs**
Focus Group (13,357)	97.7% (13,010)	2.3% (308)	11.4% (1525)	0.6% (74)	12.3% (1638)
Comparison Group (9,552)	96% (9138)	4% (387)	5.9% (565)	1.1% (105)	6.7% (639)
B.C. (2010-2011)	88%	12%	10.40%	9.80%	7.40%

Source: B.C. Government (2011a).

*Does not include out of province schools issuing B.C. graduation credentials

**Some individuals may have more than one Ministry of Education designation

The B.C. provincial government reported that in the 2010-11 school year, 12% of secondary school students in B.C. attended independent schools. Both the focus and comparison groups were under-represented by students from independent schools. Lower independent school apprenticeship participation rates could be a result of the academic and affluent orientation of many of these schools as well as poor communications between the public and private education systems. Many independent schools market themselves as university preparation schools rather than career preparation, which may appeal to a more affluent segment of the population that may also be in a better position to afford the independent school tuition fees. Also, within some immigrant populations there may be a cultural expectation for children to attend university and as a result those parents may be more prone to sending their children to an independent university preparation schools. The fact that independent schools are not part of the public system, there may be lower awareness levels of programs like SSA and ACE IT because of limited communications between the two systems. This lack of awareness could act as a barrier to youth apprenticeship program participation in independent schools.

English as a Second Language (ESL) participation in both the focus and comparison groups is far below the Ministry of Education’s provincial average of 9.8% average. The low ESL participation rate could be due in part to negative cultural biases about the trades like those found in North American culture, where less academically inclined students are streamed toward the trades. The 24% below provincial average graduation rate of the focus group ESL cohort seems to support the presence of a cultural bias. Another possibility for low ESL participation rates in the trades is the barrier caused by poor English language skills that might discourage ESL candidates from entering the trades because of limited employment opportunities.

Figure 2. Focus and Comparison Group Composition by Ministry of Education Designation

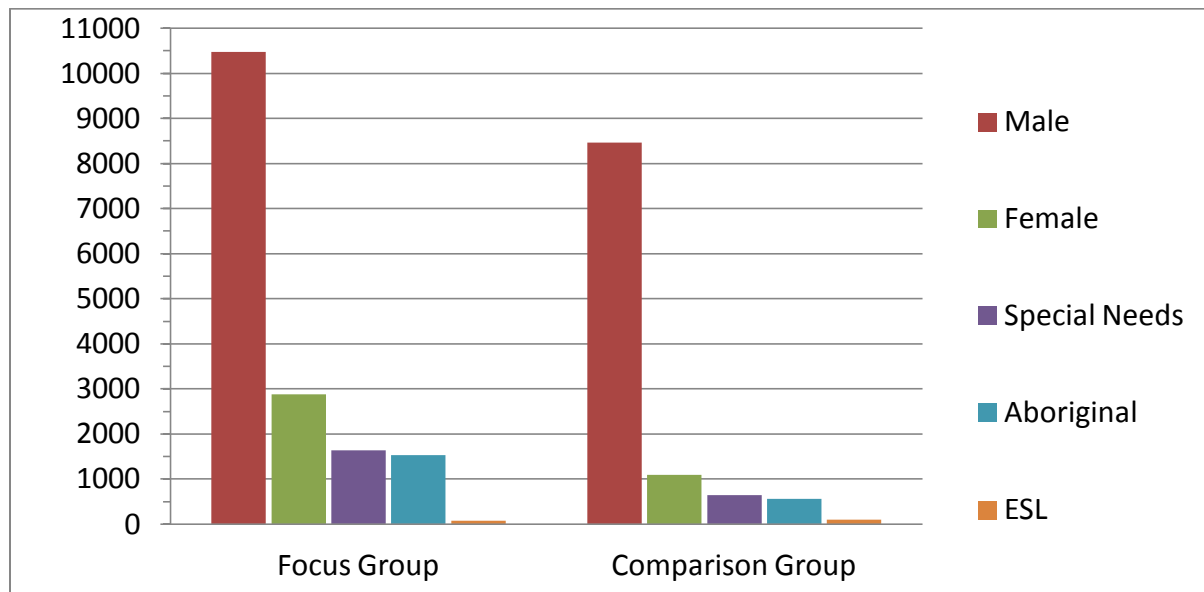


Figure 2 shows that the focus group has a 2.7 times larger “aboriginal” and a 2.6 times larger “special needs” cohort than the comparison group. Table 4 indicates the focus group “aboriginal” and “special needs” cohorts are also over-represented when compared to provincial statistics.

The high aboriginal and special needs participation rates in the focus group might be the result of school districts marketing youth apprenticeship programs to these students as an alternate

secondary school graduation pathway or as a means of retention to reduce dropout rates. Also, increased aboriginal and special needs participation levels probably resulted where school based technical training programs (ACE IT) were available due to increased awareness and accessibility. The extra support the school system can provide all students including aboriginal and special needs might make SSA and ACE IT more appealing and reduce the barriers to entry for these students..

Conversely, the under-representation of aboriginal and special needs apprentices in the comparison group could be the result of a self-selection process. Aboriginal and special needs apprentices in the comparison group are more likely to have had positive educational and employment experiences in which could have influenced their decision to take up an apprenticeship which involves both schooling and on the job training. On the other hand, people who have not had as many positive experiences in school and on the job may be less likely to take up the challenge of an apprenticeship. Therefore, without the support of the education system, many comparison group aboriginal and special needs candidates may have decided that an apprenticeship was not a viable option.

Secondary school graduation data (see Tables 7a, 7b) may supply some evidence to support self-selection. Both the focus and comparison group graduation rates for the aboriginal and special needs cohorts were both well above the respective provincial averages. This fact suggests that both groups attracted higher academic achievers. The focus group's graduation rates fell short of the comparison group's averages by a few percent. This finding may be the result of academically weaker or less confident students entering the trades through SSA or ACE IT because of the extra support they received from the education system and the attractiveness of an apprenticeship as graduation and/or career pathway. Without the support of the education system, some comparison group candidates with extra challenges might not have considered the trades as a career path.

Apprenticeship status.

Figure 3. Focus and Comparison Group Apprenticeship Status

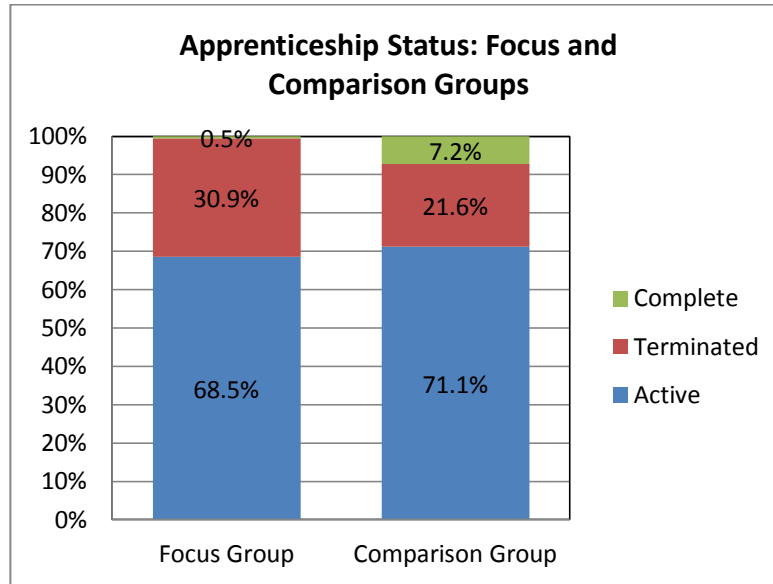


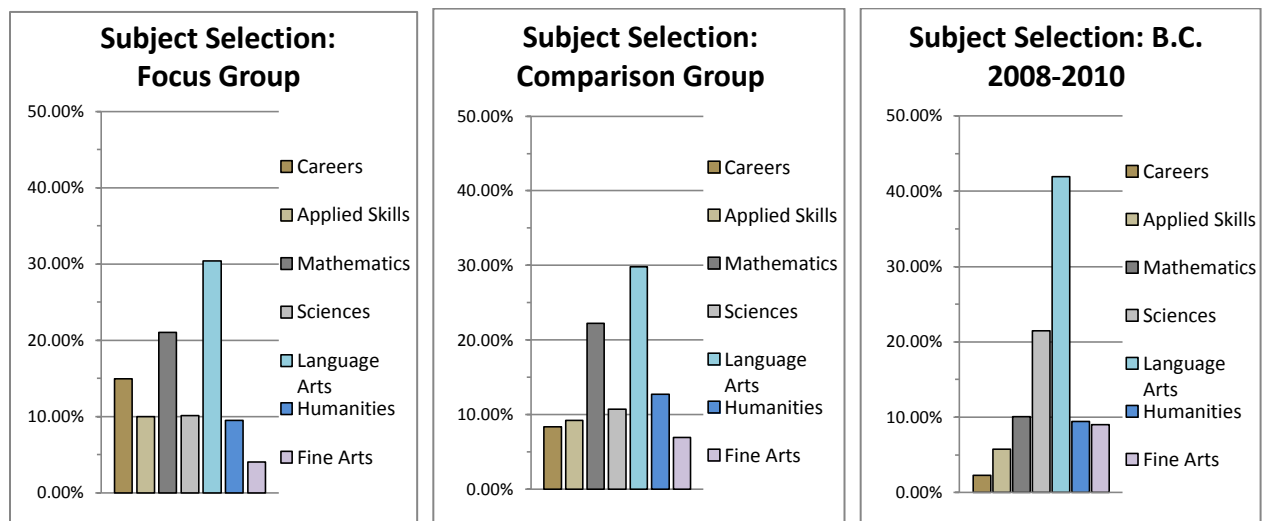
Figure 3 is a partial summary of Results Table 2a: Focus and Comparison Group Apprenticeship Statistics.

Most apprenticeships available in B.C. require roughly four years of full-time training, so many of the subjects in this study would not have been able to complete apprenticeships during the four-year data-collection period. The apprenticeship status graph (Figure 3) shows similar apprenticeship statistics for both groups except that the comparison group had 6.7% more apprenticeship completions. Although both groups began apprenticeships at the same time, the comparison group had already finished secondary school and would have had the opportunity to work full-time as apprentices. Many of the focus group individuals, on the other hand, would need to complete secondary school, which could account for much of the difference in trade certification completion.

The average apprenticeship start age for the focus group was 16.7 years. The focus group had 9.3% more terminated apprenticeships than the comparison group. The higher rate of apprenticeship terminations in the focus group could be due to age-related factors such as lower maturity levels, poor study habits, less self-motivation as well as less life and labour market experience. The older more mature and experienced comparison group might be more career-minded than the younger focus group individuals, therefore more committed to completing an apprenticeship.

Subject Selection.

Figure 4a, 4b and 4c. Focus Group, Comparison Group and Provincial Subject Selection



Figures 4a, 4b and 4c are a partial summary of Results Table 5: Provincial, Focus and Comparison Group Subject Selection from data in Appendices 6a and 6b.

Note: The seven subject areas were derived by the author, an experienced B.C. secondary school teacher. The courses used in each of the seven subject areas are the same for the focus, comparison and provincial groups. See Appendix 5 for a complete list of courses and subject area composition.

Figures 4a, 4b and 4c show that the focus and comparison groups have a similar pattern of subject selection for their grades 11 and 12 courses which differs from the provincial norm. All three groups have two dominant subject areas (above 20%) but the subject selection of the focus and comparison groups is a little more balanced than the provincial average subject selection.

The most dominant subject area for the province and for both the focus and comparison groups is language arts. Part of the reason language arts is the most selected subject area is because it is the only subject area to have compulsory English or communications courses in both grades 11 and 12. Also, high language arts selection rates may be due to the fact that many post-secondary programs, particularly in the liberal arts, have language arts course pre-requisites. So students wishing to keep their post secondary options open may take extra language arts courses. This would give some explanation as to why language arts is the most dominant subject area for all three groups. Both the 1995 and 2004 graduation programs require students to take one mathematics and one science course at the grade 11 or 12 level. The programs would therefore account for a portion of all grade 11 and 12 course selection, but to a lesser degree than language arts. Again, post-secondary programming pre-requisite course requirements may account for why 21.5% of the average course load provincially is in the sciences. This is virtually double the number of science courses taken by the focus group (10.1%) or the comparison group (10.7%).

The number of mathematics courses taken by both the focus and comparison groups is at least double the provincial average of about 10%. Minimum mathematic course recommendations (for trades) and minimum course and grade entrance requirements (for college trades foundation programs) are where many apprentices in both groups get their start in apprenticeship training. This situation may explain the extra math courses in both groups where many individuals would have chosen to upgrade and/or take additional math courses for entrance to a trade program. Also, high

school counsellors and career educators may have emphasized math (and English) courses with both the focus and comparison group students in an effort to prepare them to enter the trades and other career programs.

The highest degree of fluctuation between the focus and comparison groups is in the careers, humanities and fine arts subject areas. Indeed, 15% of the focus group courses were in careers (which made it the third most popular subject area) but individuals in the comparison group took, on average, 6.5% fewer careers courses than individuals in the focus group. Both groups had a much higher uptake on career courses than the provincial average of 2.3%. Much of the course selection for the comparison group in the careers area would have been for the two compulsory credit Planning 11 and Planning 12 courses that were part of the 1995 graduation plan. The provincial course selection data would represent students from the 2004 graduation program, as would the vast majority of the focus group subjects that do not have any compulsory careers courses at the grade 11 or 12 level. However, the replacement course for CAPP 11 in the 2004 graduation program is Planning 10 which has been included as one of the courses in the careers subject area for the focus and provincial groups. This would mean that virtually all of the comparison and group would have taken at least one extra course (CAPP12) in the careers subject area which would account for some of the comparison group's 8.4% careers subject selection total.

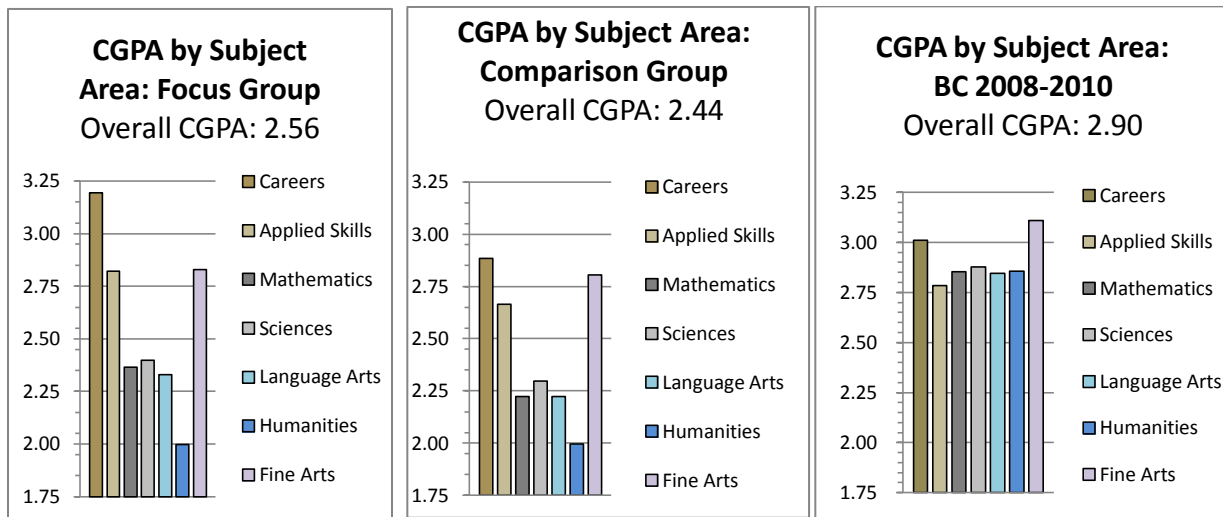
The focus group was selected on the basis that all of the apprentices had participated in the SSA work-based training program and/or the ACE IT apprenticeship technical training program. The SSA program requires four SSA courses (2-gr.11 and 2-gr.12) for completion. The number of courses required for ACE IT varies between programs, but generally four to eight grade 12 courses are credited upon successful completion. The comparison group subjects did not begin their apprenticeship training until after secondary school completion, therefore did not take any SSA or

ACE IT courses. The group selection criteria helps explain why the focus group selected 6.5% more career courses than the comparison group and 12.6% more than the provincial average.

The applied skills subject selection data shows that the subjects of the focus and comparison groups took 30 to 40% more courses in this subject area than the provincial average (5.8%). This difference may be attributed to the fact that all the individuals in the focus and comparison groups became apprentices and therefore preferred applied skills courses that would be more hands-on than many other subject areas. The difference between the focus and comparison groups applied skills courses, although very small (0.7%), could reflect some targeted coursework in other subject areas.

Cumulative grade point average.

Figure 5a, 5b and 5c. Focus Group, Comparison Group and Provincial Cumulative Grade Point Averages



Figures 5a, 5b and 5c represent the data in Results Table 6: Provincial, Focus and Comparison Groups Combined Grade Point Averages (CGPA) from data in Appendices 6a and 6b.

Note: All GPA calculations shown here, including the provincial CPGAs, were calculated by converting letter grades to number scores as follows: A=4.0, B=3.0, C+=2.3, C=2.0, C-=1.7, F&SG=0. This calculation varies slightly from the Ministry of Education GPA calculation: A=4.0,

B=3.0, C+=2.5, C=2.0, C-=1.0, F&SG=0 (B.C. Government, 2010b). The provincial GPA statistics from the B.C. Ministry of Education, therefore, may vary from the GPA statistics reported for the focus and comparison groups but they are included to support any relative differences found between the focus and comparison groups.

The 2.56 CGPA of the focus group and the 2.44 of the comparison group are .34 and .46 respectively below the provincial average of 2.90. The subject area CGPA data may explain this GPA discrepancy. The highest subject area GPAs were for careers and fine arts provincially as well as for both the focus and comparison groups. The focus group recorded the highest CGPA of all with 3.19 for careers; the provincial average of 3.11 is the highest for fine arts. The .3 range of the provincial subject area CGPAs is very small when compared to the 1.19 CGPA range of the focus group and the .89 range of the comparison groups. Both the focus and comparison group individuals had their highest CGPAs in the non-academic subject areas of careers, applied skills and fine arts. This finding might reflect not only an increased ability but also an increased interest and engagement in these subjects compared to the academic subject areas. The lower GPAs in the academic subject areas may help to explain the lower than provincial average graduation rates for the focus and comparison groups. Both the heavy academic requirements of both the 1995 and 2004 graduation programs and the academic course bias found in B.C. secondary schools support this assertion.

The focus group had a higher CGPA than the comparison group in every subject area. The GPA difference is minimal except in the careers subject area where the focus group's 3.19 CGPA is .3 higher than the comparison group. Careers was the third most popular subject area for the focus group and the majority of courses taken would have been in the youth apprenticeship programs (SSA and ACE IT). The high careers CGPA and course selection levels of the focus group could be

interpreted as students finding these courses more interesting and relevant than some of the other subjects that had much weaker participation rates and CGPAs. Focus-group individuals who linked their trade career ambitions to the importance of graduation course work may have been more dedicated and put more effort into courses in other subject areas. This supposition may also explain why this group's CGPAs were higher in every subject category than the comparison group. The comparison group may not have had the same focus and drive because they did not have a career direction and so school was not as relevant to them.

Whipps (2008) examined the works of the early education pioneers, Dewey and Adams, and echoed their claims that students need a holistic approach to education with vocational education that links to the real world. The subject selection and subject GPAs of the focus and comparison groups indicate that many of the individuals in this study appear to have worked within the confines of their respective graduation programs to create a more balanced education for themselves. This finding includes hands-on applied skills and career courses that provide the skills and links to the world of work that Whipps, Dewey, and Adams advocated.

Secondary School Graduation Results

Figure 6. Provincial, Focus and Comparison Group Six-Year Completion Grade 12 Graduation Rates

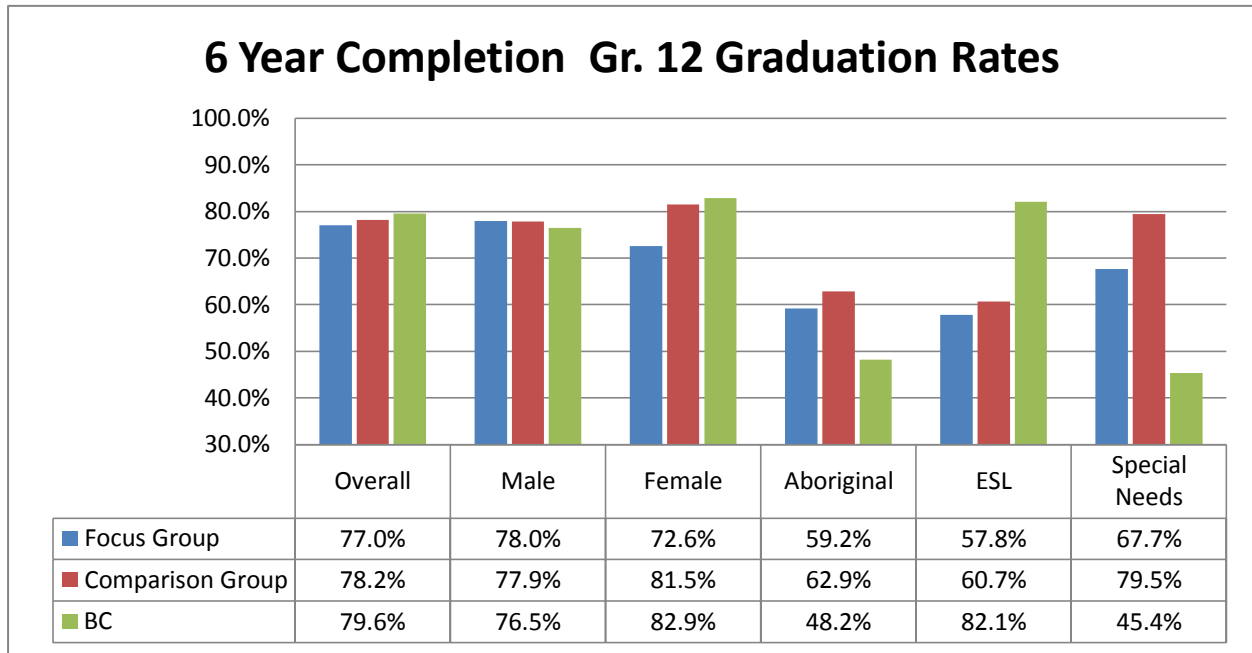


Figure 6 is a partial summary of Results Tables 7a and 7b: Provincial, Focus and Comparison Group Graduation Rates and from B.C. Ministry of Education graduation data in Appendix 7.

Note: The six-year completion grade 12 graduation rates of the focus and comparison groups are within 3% of the 79.6% provincial average (B.C. Government, 2010a). As discussed in “Data Limitations” at the beginning of this chapter, a small variation in graduation rates found between the provincial averages and two groups in this study may depend on the two ways in which the six-year completion graduation rates were calculated.

The six-year completion grade 12 graduation rates in Figure 6 for males in both the focus and comparison groups are a little higher at 1.5% and 1.4%, respectively, than the provincial 76.5%, but still relatively close. The female focus and comparison group six-year completion grade 12 graduation rates, in contrast, varied by more than 10%. The 72.6% female focus group graduation

rate was the weakest at 10.3% below the provincial average and 8.9% below the comparison group female cohort. Some explanation for the difference between the female focus and comparison groups might be found in the trades in which individuals were registered.

As discussed in the “Group Composition” section of data analysis and interpretation, about 75% of the comparison group females are spread out over 11 trades. However, about 75% of the females in the focus group are in two trades, hairstylist (46.7%) and professional cook (28.7%). These two trades have the lowest graduation rates of the five trades used for the five trades analysis (see Result Tables 15a and 15b). The graduation data indicates that many of the focus group females that are attracted to the youth apprenticeship programs in secondary school are not as scholastically inclined or motivated at this age as the females who enter the trades after leaving secondary school.

The English as a Second Language (ESL) focus and comparison group cohorts were at least 20% lower than the 82.1% provincial average for the six-year completion grade 12 graduation rates. The ESL focus group’s 57.8% graduation rate was the lowest of all the focus group graduation rates and 24.3% below the provincial average. ESL was by far the smallest of the designated cohorts. Only 45 focus group and 89 comparison group individuals designated as ESL were eligible to for six-year completion grade 12 graduation. The 57.8% graduation rate of the focus group ESL cohort and the 60.7% graduation rate of the comparison group are far below the 82.1% provincial average. The small ESL numbers in both the focus and comparison groups make interpretation unreliable. Win and White (1997) and Taylor (2007) agreed that academic bias persists in many countries, including Canada. It was probable that some of the ESL students had recently immigrated to Canada, so cultural differences and expectations may have been a barrier from entering the trades or

trades as a less desirable career option. Also with recent ESL immigrants, language issues would likely be a barrier to entering the trades.

The aboriginal six-year completion grade 12 graduation rates for both the focus and comparison groups are significantly higher than the 48.2% provincial average (see Figure 7). The focus group's aboriginal graduation rate of 59.2% is 11% higher than the provincial average; the comparison group's 62.9% graduation rate is 14.7% higher than the provincial average. Part of the difference in graduation rates between the focus and comparison group aboriginal cohorts might be in part the result of a self-selection process (described at the beginning of this chapter) that would be more prevalent in the comparison group. However, Table 7b results show that the number of aboriginal graduates from the focus group is greater at 568 when compared to the 324 of the comparison group. With the extra support and resources schools can offer students, it is possible that some extra aboriginal students may have entered into one of the youth apprenticeship programs as an alternate graduation route or a means of retention. This reasoning would help explain the greater volume of aboriginal graduates and potentially those that didn't graduate, but left school to transition directly into the workforce with an apprenticeship.

A similar but more dramatic graduation rate increase can be seen in the focus and comparison group apprentices that have been designated as "special needs" by the Ministry of Education (see Figure 6). Both groups' six-year completion grade 12 graduation rates are over 20% above the provincial average. As with the aboriginal group, the 12.2% difference in the special needs focus and comparison group cohort's graduation rates may be attributable to self-selection factors in the comparison group cohort in which more candidates with histories of success in school and/or work have entered an apprenticeship. The differences between the focus and comparison group special needs graduation rates must be tempered by the fact that the larger focus group cohort

produced 696 graduates compared to 500 from the comparison group, which is 39% more overall. See Table 7b in “Results” for details.

Youth apprenticeship programming taken by the focus group’s aboriginal and special needs students strongly suggests that it had a positive influence on secondary school six- year completion grade 12 graduation rates when compared to the provincial averages. Perhaps the provision of relevant educational programming and/or an alternate graduation pathway that aids student transition into the workforce play a factor in these increased graduation rates. Although there is little research on the effects of apprenticeship programming of aboriginal and special needs graduation rates, these findings are supported by those found in a study by Campbell and Boyd (2007). These researchers discovered that apprenticeship and other career programming had benefitted aboriginal graduation rates, especially males. Repeated studies on the Wisconsin Apprenticeship Program have shown increased achievement and graduation rates for special needs students who have participated in the state-run youth apprenticeship program (Hughes, 2002).

Five Selected Trades Analysis

Table 20. Top 10 Trade Areas in Canada by Registration

Rank	Trade
1	Electrician
2	Carpenter
3	Automotive Service Technician
4	Plumber
5	Welder
6	Hairstylist
7	Cabinetmaker
8	Professional Cook
9	Exterior Finishing
10	Heavy Duty Equipment Technician

Table 19 above is a summary of Results Table 8: Top 10 Trade Categories by Registration in Canada (Canadian Apprenticeship Forum, 2010)

Over 140 trades in B.C. require a broad range of talent, skill, and knowledge; individuals in the focus and comparison groups have been registered in most of the trades (see Appendix 4). The most popular focus and comparison group trades (see Results Table 3) are in line with the top 10 trades in Canada as shown in Table 19. In fact, over 70% of the subjects in this study were linked to one the 10 highest volume trades in Canada.

For analysis, five of the more popular trades have been selected: automotive service technician, carpenter, construction electrician, hairstylist and professional cook. Results Table 3 indicates only professional cook and hairstylist were not consistently in the top 10 most popular trades for the females and males of the focus and comparison groups. Professional cook was in the

top 10 for three of the groups but for the comparison group males it ranked only 13th. Hairstylist was ranked as only one of the top 10 trades in the female focus and comparison groups; however, hairstylist was included in the analysis because it was the overwhelming trade choice of the female focus group (46.7%) and ranked second with the female comparison group (17.8%).

Trades Analysis Group Composition

Figure 7. Five Selected Trades Composition by Gender

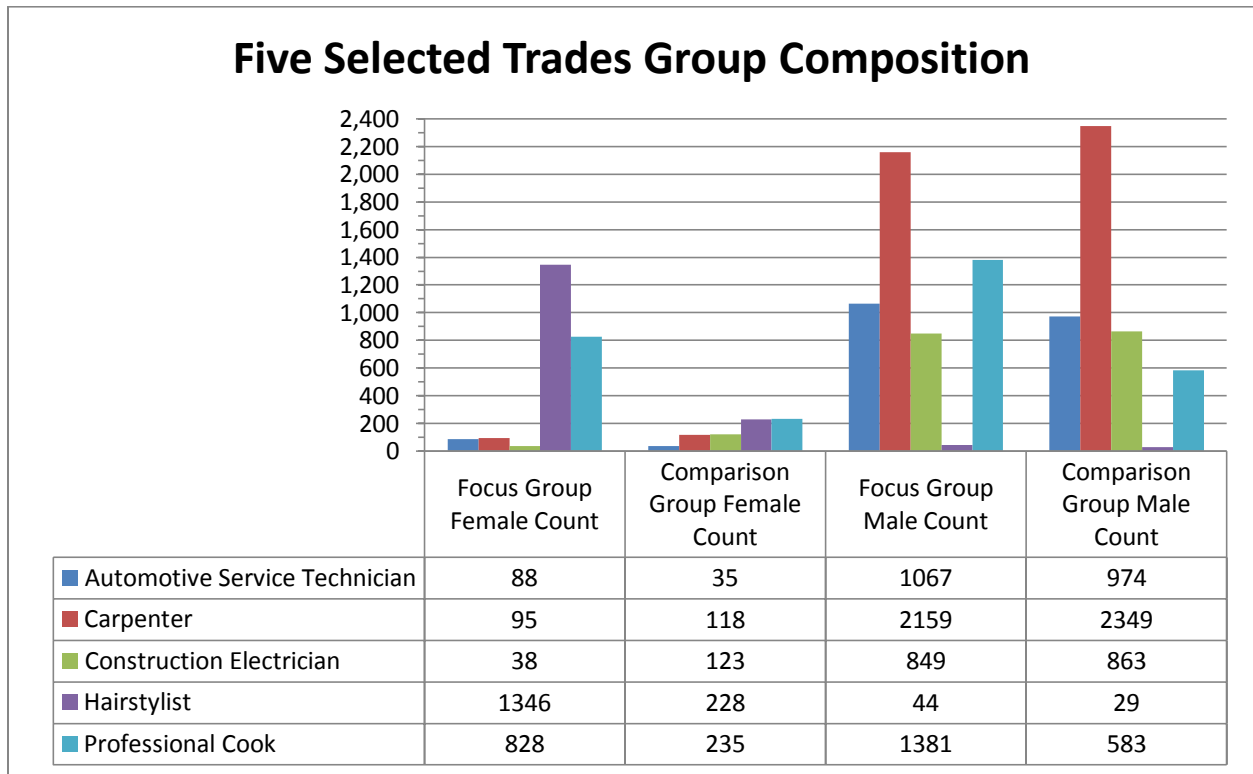


Figure 7 is a partial summary of Results Table 9: Five Selected Trades Group Composition by Gender from data in Appendix 9.

Figure 7 (above) shows the distribution of male and female participants from the focus and comparison groups across the five trades selected for further analysis in this study. Over 46% of the female focus group is in the hairstylist trade and more than 28% are in the professional cook trade,

which totals over 75% of this cohort. Carpentry is the dominant choice for males in both cohorts as well as overall, which is not surprising because it is the second highest volume trade in Canada.

The choice of the three dominant trades mentioned here may be explained by independent variables.

None of the other groups are so unevenly distributed as the female focus group, which makes it unique in this respect. As mentioned in the group composition section at the beginning of this data analysis and interpretation chapter, hairstylist and professional cook are two of the few traditional female trades in B.C. and in Canada. Figure 7 shows hairstylist is a trade program that is predominately made up of females in both the focus and comparison groups. Professional cook is also fairly popular amongst the males, making it more gender neutral.

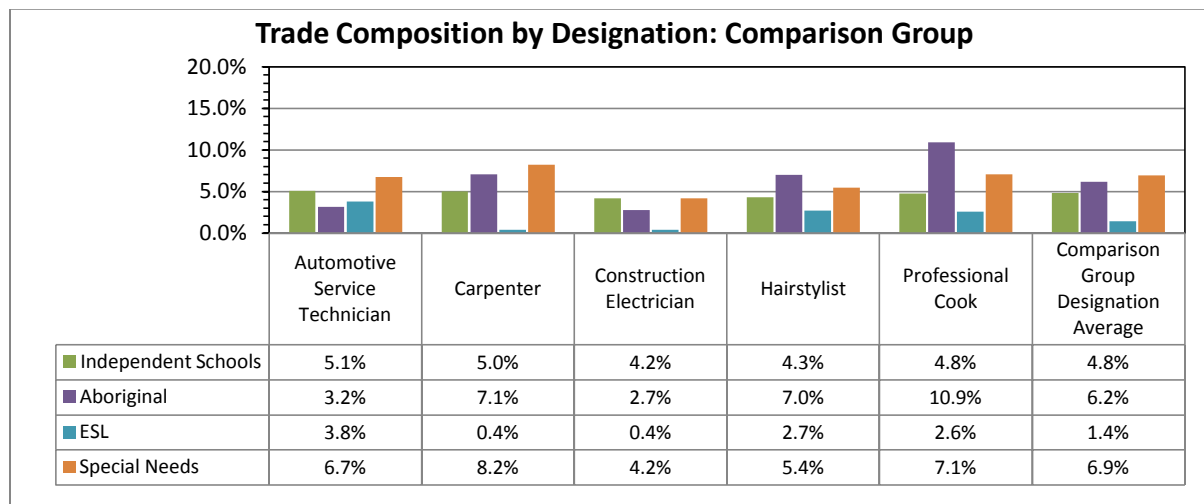
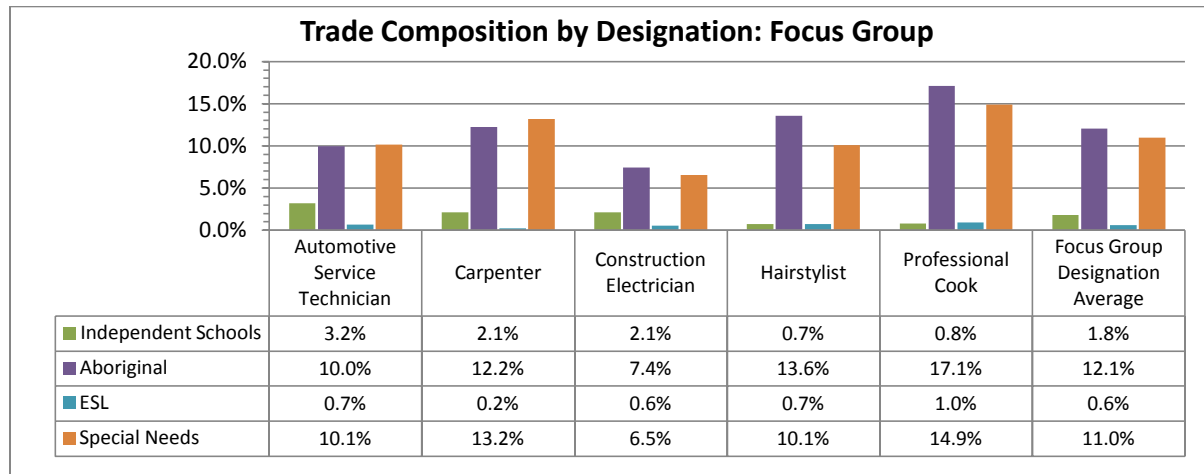
Many school districts in B.C. offer hairstylist and professional cook technical training programs through ACE IT onsite at a secondary school, which dramatically increases the trade's exposure amongst secondary school students and an easy option. Almost all secondary schools have elective courses in foods and many in cafeteria, which allows students a greater chance to explore this field and develop an interest in the trade and transferable skills. The popularity of hairstylist and professional cook amongst secondary school female students, therefore, is probably at least partially due to its being one of the few alternate pathways to graduation that is career oriented, attractive and readily accessible in many school districts.

Carpentry is the number two ranked trade nationally but number one among the males in the focus and comparison groups. Carpentry is the third most popular choice among the females after hairstylist and professional cook of both groups. A few variables may explain the popularity of carpentry. Just like foods and cafeteria courses and in-school hairstylist programs, secondary school students are exposed to technology education throughout middle or junior secondary and secondary

school. Virtually all middle and secondary schools have a woodwork shop. Most students are cycled through woodwork in one or two of their junior years as part of applied skills rotation courses and dedicated woodworking and construction courses in secondary school. As a result of having the facilities and equipment and the carpentry expertise, in many cases, school districts use the woodwork programs as feeders into carpentry programs they run in school district facilities.

Besides increased exposure in the school system, a construction boom (2005-2008) occurred in B.C. during most of the period covered by this study (2005-2009). During the construction boom, media attention focused on the skills shortage in B.C., particularly in the construction trades. At this time, employers were paying above-average wages and offering apprenticeships to attract and retain workers. The skills shortage and media hype combined with secondary school exposure to carpentry undoubtedly influenced the decision of some of this study's participants to go into the carpentry trade.

Figure 8a and 8b. Five Selected Trades Composition by Ministry of Education Designation: Focus Group and Comparison Group



Figures 8a and 8b are a partial summary of Results Table 10: Five Selected Trades Group Composition by Ministry of Education Designation from data in Appendix 9.

Figures 8a,b indicate the five selected trades comparison group's overall independent school participation rate average of 4.8% is more than double the 1.8% participation rate average for the focus group. The higher comparison group independent school participation rates in all five trades can probably be largely explained by the fact that all of these people started their apprenticeship after leaving high school. Therefore, they have had on average five or six more years of life and

employment experience than those still in school which would have given them time to explore and adjust education and career goals to suit their interests and needs.

ESL participation levels for all of the selected trades in both the focus and comparison subgroups are very low (all below 5%). This is a little higher than the focus and comparison groups as a whole but there are less than 10 apprentices in half of the trades listed (see Results Table 10). This small sample size makes interpretation of the data unreliable, so the ESL trade analysis results will not be discussed.

The average aboriginal participation levels for the focus group five selected trades cohorts is 12.1% which is close to the 11.4% aboriginal composition of the focus group as a whole (see Figures 8a,b).

Aboriginal participation levels in the five selected trades focus and comparison subgroups reveals similar finding to the groups as a whole which at 12.1% is almost double the comparison subgroup's average. Of note is the focus group automotive service technician aboriginal participation rate of 10%, which is more than triple that of the 3.2%. The aboriginal focus group professional cook participation rate of 17.1% is the highest aboriginal participation rate in any of the selected trades. The focus group aboriginal students are also on average slightly over represented (1.7%) in the five selected trades. The most probable explanations for the aboriginal focus group cohorts high participation rates in automotive service technician and professional cook would likely be increased awareness, exposure, accessibility, support and possibly marketing of these popular school based ACE IT technical training programs.

The special needs designated focus group cohorts of the five selected trades are under represented by 1.7% when compared to the focus group as a whole. However, the special needs

comparison group cohorts of the five selected trades are .2% over represented (see Figures 8a,b and Table 4). The participation rates in the five trades for both the comparison and focus group special needs cohorts are similar and roughly comparable to their representation level in the focus and comparison groups as a whole. Professional cook and carpentry are the most popular trades for both the focus and comparison group special needs cohorts which are also two of the most popular trades for the focus and comparison groups. As with the aboriginal cohorts, the advantages of school based ACE IT programs for students that may need extra support has probably enabled more special needs students to start and apprenticeship (ACE IT or SSA) while in high school and therefore account for the higher participation rates when compared to the comparison group. The lowest special needs participation rates for the focus group and comparison group cohorts is construction electrician. Construction electrician requires higher math skills than the other four trades in this analysis which may explain the lower participation levels.

Aboriginal and special needs subjects are, on average, 1.7% and 3.6% respectively over-represented in the five selected trades. As previously noted, these findings are close to the provincial rates stated in the group analysis. The comparable participation rates between the focus and comparison groups would support the same suggestions given for these differences in the group analysis. School districts are targeting aboriginal and special needs students with marketing strategies to increase trades awareness and youth apprenticeship programs options that can lead to graduation. School districts are reducing or removing barriers to make it easier for students to enter the trades in a number of ways. Youth apprenticeship technical training is readily available and accessible in most school districts. Many technical training programs are offered at schools or through a local college. Careers staff members in many school districts find and prepare students to

enter the trades and provide support during the youth apprenticeship program. On the other hand, because comparison group subjects are no longer in the K-12 system, they are less likely to have the same awareness of apprenticeships and apprenticeship opportunities. The barriers to entering some trades include living in rural areas that lack businesses with apprenticeship opportunities and institutions providing technical training. This is the case for more than 14% of aboriginal people who live on and off reserve in rural and isolated areas of B.C. (Industry Training Authority and Aboriginal Human Resources Council, 2008). Locating information on the trades, learning how to become involved in the trades and the related administrative procedures may also be a deterrent.

Trades Analysis Apprenticeship Status

Figure 9a and 9b. Five Selected Trades Apprenticeship Status: Focus and Comparison Group

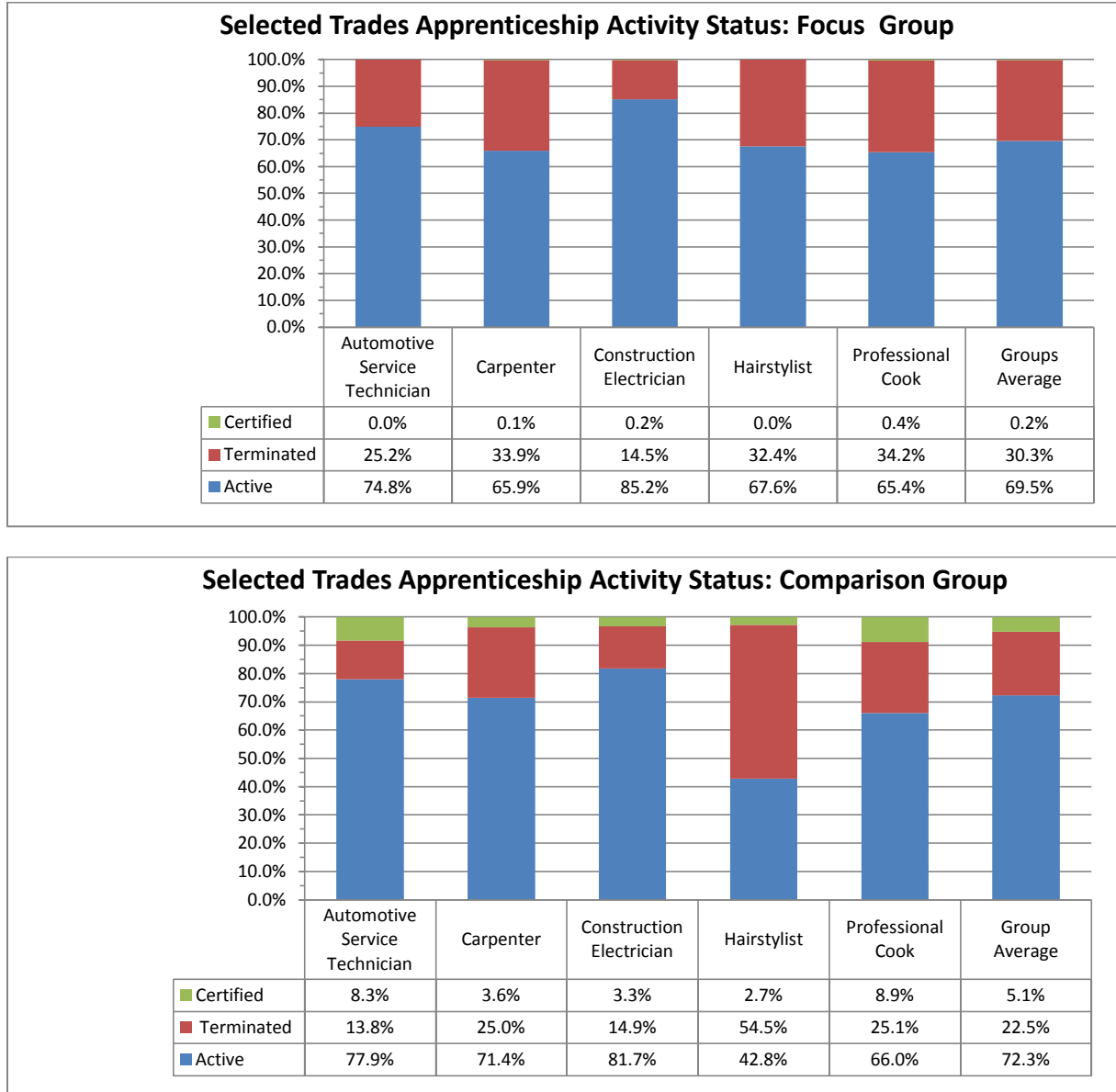


Figure 9a and 9b are a partial summary of Results Table 11: Five Selected Trades Focus and Comparison Group Apprenticeship Status from data in Appendix 9.

In general, the apprenticeship activity status rates for the Five Selected Trades of this study are proportional to those found for the focus and comparison groups as a whole (see Figure 9). Less

than 1% of the focus group subjects in any of the five trades had achieved trades certification. This low certification level is not surprising because many would only just have started their apprenticeship and would still be attending secondary school. The comparison group certification levels range from 2.7% for hair stylist to 8.9% for professional cook. These certification levels are below the 40% provincial average certification rate (Industry Training Authority of British Columbia, 2011) but because of the five-year data collection period (Feb 2005-Dec 2009) of this study, many of the comparison group participants would not have had enough time to complete their apprenticeships. The apprenticeships range from 1,000 hours for professional cook one to 6,000 hours for construction electrician. The 7.8% higher termination rate of the focus group may be attributed to the younger average age-related factors such as labour market inexperience, immaturity and career exploration that would make these subjects prone to changing their mind and moving in a different career direction.

Figures 9a,b show the active and termination levels for both the focus group and comparison group trades are roughly the same, with the exception of construction electrician and the comparison group hairstylist. Both the focus and comparison group construction electrician cohorts have the greatest number of active apprentices at 85.2% and 81.4% respectively, which is over 10% higher than any other trade in the focus group. The focus and comparison electrical and automotive cohorts also had the highest CGPA and graduation rates of the five trades (see Figures 12 and 14a). Higher levels of secondary school achievement may be linked to students who have more personal drive and are more goal-oriented, which could explain why the electrical cohort has a greater number of active apprentices than the other trades.

The low active apprenticeship rate of the comparison group's hairstylist cohort may be related to success in secondary school. The hair stylists had the lowest CGPA and graduation rates

of all the trades, which is inverse to the relationship found for these school success indicators for construction electrician and automotive service technician. At the provincial level, hairstylist has a certification rate of 6%, well below the 40% provincial average (Industry Training Authority of British Columbia, 2011), which suggests there is a high incompleteness rate in this trade. This finding may help to explain the low level of active apprentices in the comparison group.

Trades Analysis Subject Selection

Figure 10a and 10b. Five Selected Trades Subject Selection: Focus and Comparison Group

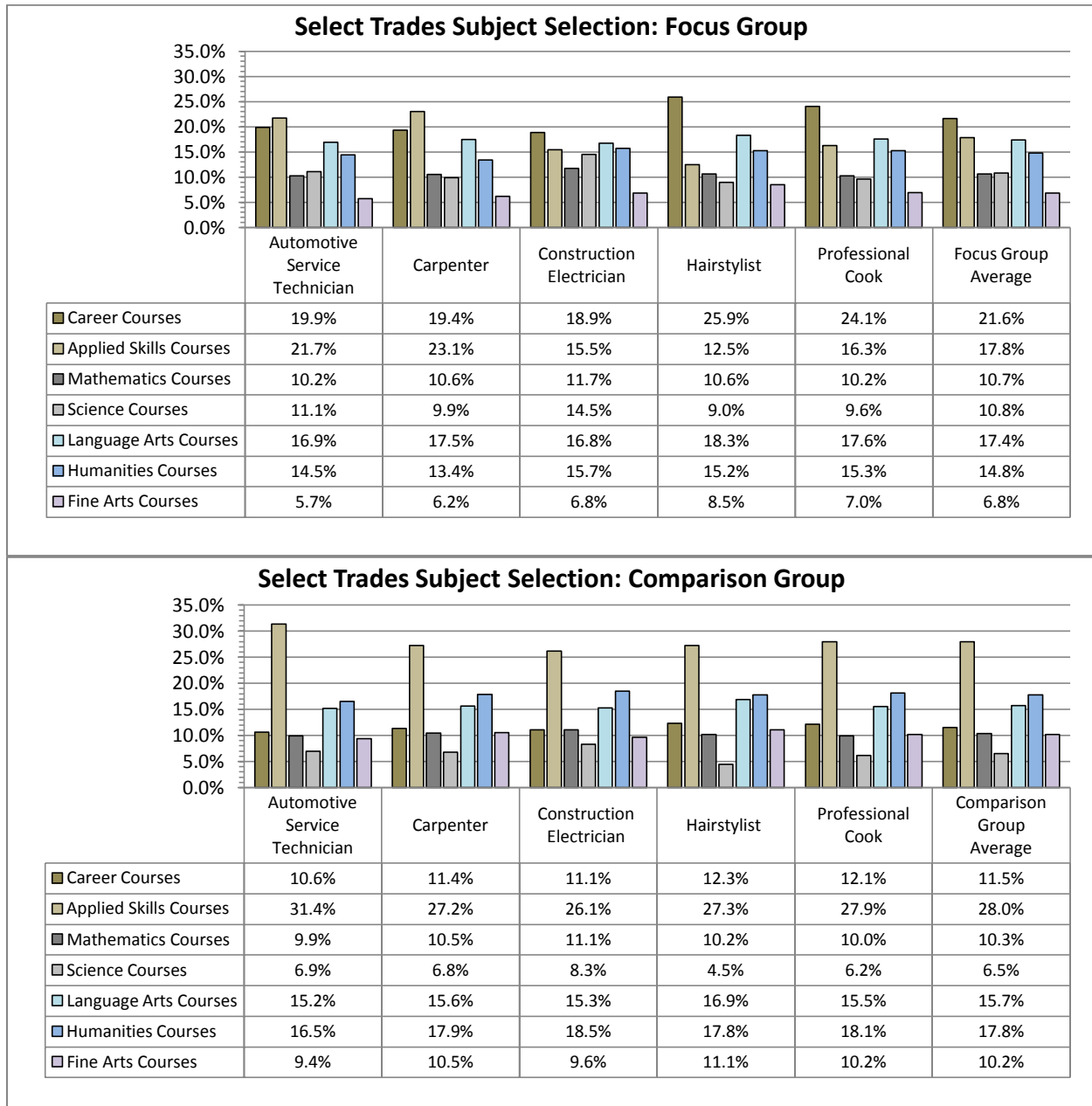


Figure 10a and 10b are a partial summary of Results Table 12: Five Selected Trades Focus and Comparison Group Subject Selection from data in Appendix 9.

Figures 10a and 10b shows evidence of the focus group cohorts in the five selected trades choosing a bit more of a balanced course load across the seven subject areas than the comparison cohorts. The pattern of subject selection, however, is somewhat similar in all trades in both the focus and comparison groups. The exception is the career courses, which are understandably more dominant in the focus groups because all of those subjects have taken ACE IT and/or SSA courses. Applied skills courses are more dominant than career courses in the comparison group. It should be noted that the careers course selection for focus group trades may actually be higher than indicated in this study. Some post secondary course names on the education records supplied by the Ministry of Education for this study did not supply enough information to clearly identify them as ACE IT related technical training courses. In cases where there was course name ambiguity, courses were categorized as applied skills.

In the academic areas, apprentices in the five trade analysis focus group cohorts took slightly more academic course loads than the comparison group. Overall in the focus group trades cohorts selected 4.2% more science and 1.7% more language arts and 0.4% more mathematics courses than their counterparts in the comparison group (see Figures 10a,b). However, the comparison group trades cohorts selected 3% more courses in the humanities than their focus group counterparts. In the non-academic area, the participants in the comparison group trades cohorts selected 3.4% more fine arts courses and 10.2% more applied skills courses than the focus group trades cohorts, but individuals in the focus group trades selected, on average, 10.1% more career courses than the comparison group trades cohorts.

The inverse relationship between the focus and comparison groups' selection of career courses and applied skills courses could be due to the fact that the comparison group did not have youth apprenticeship programming opportunities in secondary school and therefore took extra

applied skills and fine arts courses. The slightly higher academic load of the focus group trades cohort could be the result of graduation planning by individuals with career or guidance counsellors to accommodate youth apprenticeship courses and support courses in their graduation programs.

Figure 11 (below) shows that even though the comparison group participants in every trade took, on average, 1.1 more courses than the focus group participants, the extra course(s) were not used to create more of an even distribution of academic/non-academic courses.

Figure 11. Five Selected Trades Average Individual Course Count: Focus and Comparison Group

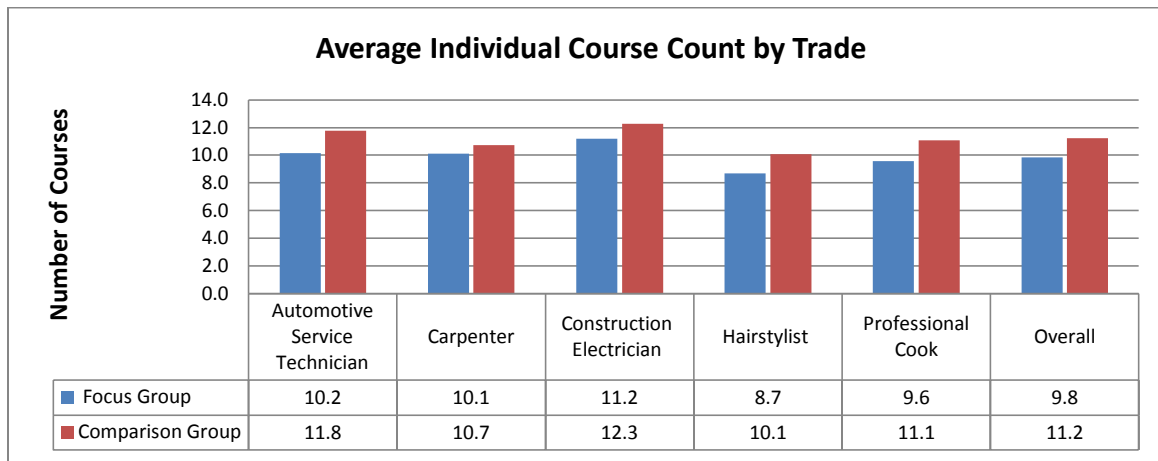


Figure 11 is a partial summary of Results Table 12: Five Selected Trades Focus and Comparison Group Total and Individual Average Course Count from data in Appendix 10.

The subject selection and course counts in Figures 10a,b and 11 (above) indicate that construction electricians in both the focus and comparison groups took the most courses on average and had the most even distribution of academic and non-academic courses. All of the other trades are fairly close to the group average for individual course counts except hairstylist, which is 1.1 courses lower than the group average for both the focus and comparison groups.

Trades Analysis Grade Point Averages

Figure 12. Five Selected Trades Cumulative Grade Point Average: Focus and Comparison Group

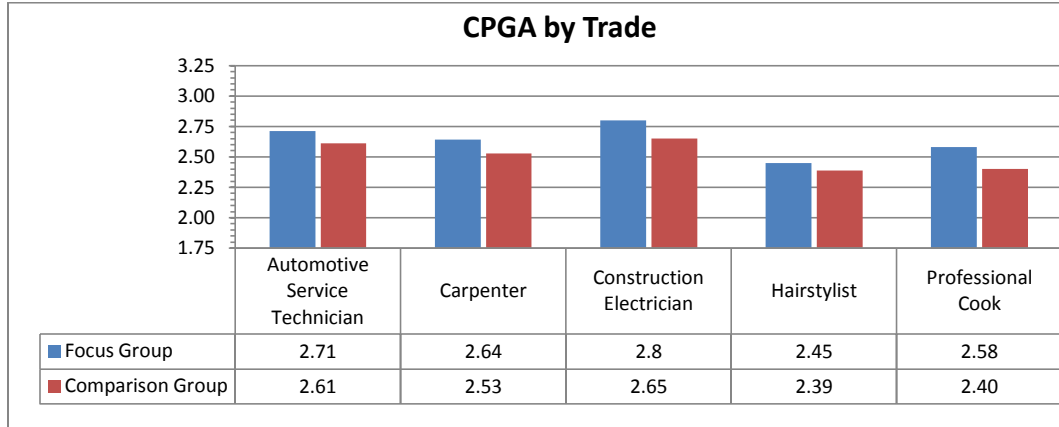


Figure 12 is a partial summary of Results Table 14a: Five Selected Trades Focus and Comparison Group Combined Grade Point Averages from data in Appendix 10.

Participants in the five focus group trades had, on average, a 0.10 higher CGPA than their counterparts in the comparison group trades (see Figure 12). Professional cook had the greatest CPGA difference with 0.18 and hairstylist the smallest with 0.06. The construction electrician cohorts in both groups achieved the highest CGPAs with 2.80 for the focus group and 2.65 for the comparison group. The hairstylist cohorts had the lowest CGPAs with 2.45 for the focus group and 2.39 for the comparison group. Even though CPGAs for all of the trades in this analysis are below the provincial average of 2.90, the CGPA results and subject selection data indicate the construction electrician cohorts of both groups were the most comfortable with B.C.'s academically oriented graduation programs and the hairstylist cohorts found it the most difficult and/or least relevant.

The CGPA results for the focus and comparison group five trades analysis cohorts are consistent with those found for the focus and comparison groups as a whole that were discussed previously. Apprentices in both the focus and comparison group five trades analysis cohorts had

higher CGPA averages in the non-academic subject areas with the highest in the careers subject area where all five trades in the focus group were above the 3.01 provincial average.

Figure 13a, 13b and 13c. Five Selected Trades Cumulative Grade Point Average by Subject Area:
Focus Group, Comparison Group and Provincial

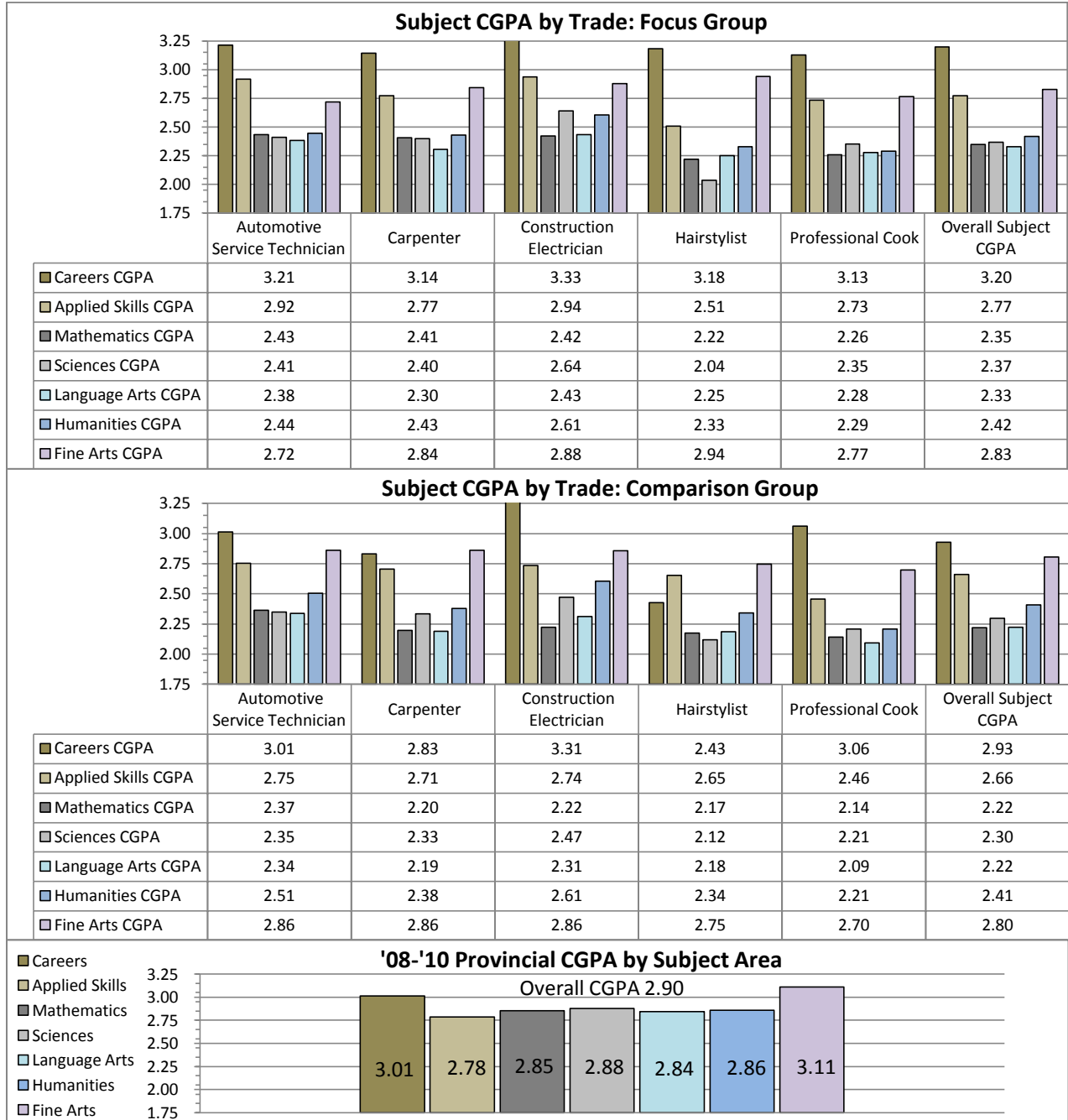


Figure 13a, 13b and 13c are a partial summary of Results Table 13a and 13b: Five Selected Trades Focus and Comparison Group Combined Grade Point Averages (CGPA) from data in Appendices 6 and 10.

There is a similar CGPA pattern in all seven subject areas in the focus and comparison group five trades analysis cohorts as well as the provincial averages, with the highest CGPAs in the non-academic subject areas (see Figures 13a,b,c). It is only in the Provincial average for the applied skills subject area where the pattern does not hold, which has the lowest provincial subject area CGPA of 2.78.

The selected trades CPGA by gender data (see Appendix 9) shows that the females in all trades in the focus and comparison groups had higher CPGAs than the males in either the focus or comparison groups for the same trade. Appendix 9 indicates that with the exception of the female carpentry cohort, the focus group males and female trade cohorts had higher overall CGPAs than the comparison group trades cohorts. Both of these focus and comparison group five trades analysis cohort findings are consistent with those for the CGPA results for the focus and comparison groups as a whole. Differences in CGPA gender results for the selected trades may not be accurate given the low cohort numbers in a few of the trades. Other factors that may have affected the results could be associated with lower male maturity levels.

The 3.20 overall CGPA for the focus group five select trades analysis cohorts in the careers subject was the highest overall CGPA for the focus or comparison group trades analysis cohorts and well above the 3.01 provincial average (see Figures 13a,b and c). The 2.04 and 2.12 sciences CGPA scores for the focus and comparison group hairstylists were the lowest CGPAs for both groups, 0.84 and 0.76 respectively, lower than the provincial average of 2.88.

Both the focus and comparison group five trades analysis cohort subject area CGPA ranges are more than double the 0.33 CGPA subject area range of the provincial average (see Figures 13a,b,c). This difference in subject area performance may be a partially attributed to limited school

district funding. The higher costs associated with vocational programming means there are generally fewer course and program options available to students who (a) find more relevance in hands-on courses and vocational programming, and (b) are not necessarily on a university pathway. Therefore discontent with grade 11 and 12 course requirements and available programming could probably factor into the more erratic subject area GPAs and graduation rates of the focus and comparison groups and trades cohorts in this study who have all shown a preference at some level for hands-on work and learning.

The careers subject area had the highest CGPA for every focus group trade cohort, averaging 0.37 higher than the corresponding comparison group trades cohort's CGPA for the same subject area (see Figures 13a, b). The dominance of careers as the most popular subject area and the highest CGPA in the focus group select trades cohorts suggest that the availability of apprenticeship programming in secondary schools influences the subject areas in which courses were taken. This improvement in subject area CGPA when compared to comparison group trades cohorts may be associated with the availability of apprenticeship programming in secondary schools. Part of the subject selection differences may be attributed to apprenticeship program (SSA and ACE IT) preparation done by school career and guidance counsellors. The counsellors try to identify students interested in taking apprenticeship programming in grade 10 so they can help to focus grade 11 and 12 courses to meet student career and graduation needs. The higher CGPA performance of the focus group trades cohorts in all subject areas when compared to the comparison group could be attributed to the fact that these students found a career goal that provided them with a foundation on which to place their secondary school course work. To reach the career goal of becoming a tradesperson, the purpose and choice of courses may be clearer to students who in turn may become more focused and motivated. This focus may result in somewhat higher grades. Well-

defined career pathways are linked to a smooth transition from school to the establishment of adult work identities (Furlong & Cartmel, 1997; McMillan & Marks, 2003).

Trades Analysis Secondary School Graduation Results

Figure 14a and 14b. Five Selected Trades Six-Year Completion Grade 12 Graduation Rates:, Focus and Comparison Groups and Provincial

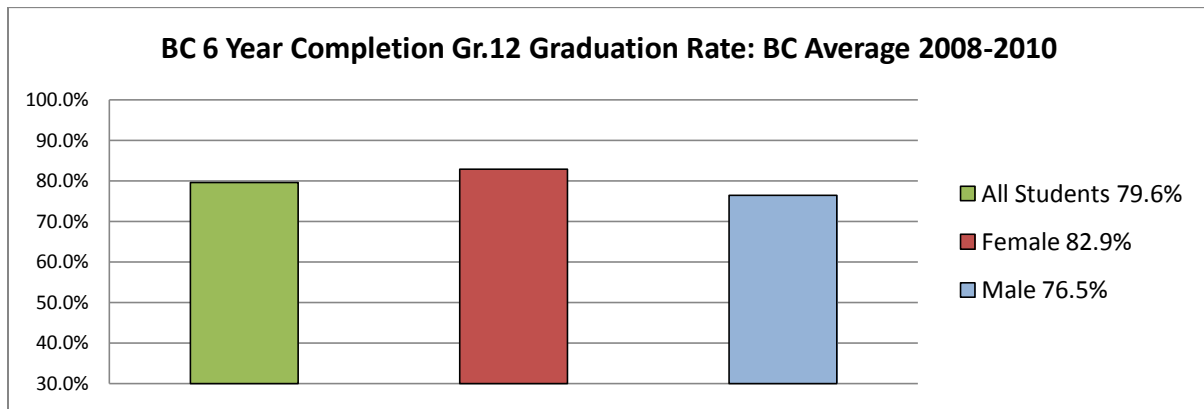
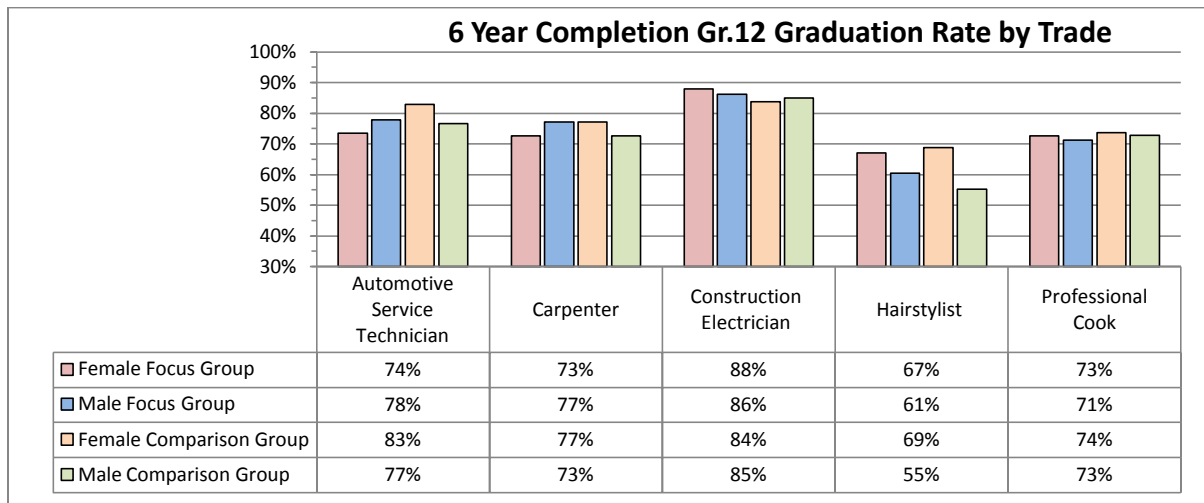


Figure 14a and 14b are a partial summary of Results Table 7a, 15a and 15b: Provincial, Focus and Comparison Group Graduation Rates and Five Selected Trades Focus and Comparison Group Graduation Rates from data in Appendix 7.

The graduation rates of the focus group construction electrician cohort (87.0%) and the comparison group construction electrician cohort (84.5%) and automotive service technician cohort (80.0%) had higher graduation rate averages than the 79.6% provincial average and the focus group and comparison group averages of 76.6% and 76.7% (see Figures 14a,b). Conversely, the hairstylist cohorts had the lowest graduation rate of 62% for the comparison group hairstylist cohort and 64% for the focus group hairstylist cohort.

Not surprisingly, when the subject area selection and CGPA findings for the trades cohorts are included with the graduation rates (see Figures 13a,b,c and 14a,b), the cohort participants who selected more academic courses tend to have higher subject area and CGPAs and higher graduation rates. The cohorts with lower graduation rates tended to select lighter academic course loads and have lower subject grades and CGPAs.

Figure 14a shows that a female cohort in each trade had the highest average graduation rate. The female comparison group had higher graduation rates in the focus group female trades cohorts except construction electrician. The focus group male trades cohorts had higher graduation rates than the comparison group in all of the trades except professional cook. The generally higher graduation rates of the females are in line with provincial graduation statistics and may be evidence of self-selection and higher motivation levels.

Conclusions

The purpose of this study is to compare (a) the apprenticeship and secondary school records of those people in B.C. who started an apprenticeship while enrolled in secondary school (focus group) to (b) those who began their apprenticeship after leaving high school (comparison group).

A total of 22,909 apprentices have had their Industry Training Authority apprenticeship and Ministry of Education grade 11 and 12 education records examined. The 13,357 individuals in the focus group began an apprenticeship while enrolled in secondary school and the 9,552 individuals in the comparison group started an apprenticeship after leaving secondary school. From these groups, individuals from five popular trades were selected for analysis to check for differences or similarities between these trades and demographic groups. Provincial apprenticeship and education statistics were used, where appropriate, to compare focus and comparison group findings to provincial norms.

This research has found evidence suggesting that apprenticeship programming in secondary school encourages a wider variety of people to take apprenticeships. The apprenticeship training and associated programming in the grade 11 and 12 years may help students improve GPAs across all subject areas as well as the graduation rates for some designated groups.

The composition of the focus group was much more diverse than the comparison group. The focus group had approximately double the numbers of females (22% vs. 11%), aboriginal students (11.4% vs. 5.9%), and individuals designated as special needs (12.3% vs. 6.7%). The focus group participation results clearly indicate that it is easier for these groups to enter the trades while still in the secondary school environment. The school system can provide more to (a) increase awareness,

(b) provide access to trades training, and (c) provide students with administrative and educational support before and during training. Many secondary schools in the province are equipped with commercial kitchens, for example, allowing them to offer onsite professional cook technical training through ACE IT. Increased accessibility to professional cook technical training and support may explain why this trade had the highest aboriginal and special needs participation rates of the five trades involved in the trades analysis. Apprenticeship programming in secondary school provides an alternate graduation pathway that maybe seen as more relevant by students who do not fit into the regular academically focused graduation pathway.

The course selections of the focus and comparison groups revealed subject selection differences between the two groups and the provincial norm. Both the focus and comparison groups took substantially more vocational course loads than the academic provincial norm. Both groups averaged at least double the amount of career, applied skills and mathematics courses than the provincial average. This vocational subject area selection was evident in all five trades in the trade analysis. Such consistent course selection suggests vocational programming in secondary school was more relevant and the preferred graduation pathway for individuals in both groups of this study. The lack of academic course selection outside of compulsory courses indicates that most individuals may not have been motivated to pursue a graduation pathway that led to college or university. This is especially true for the comparison group subjects who did not begin an apprenticeship until the average age of 23. This situation suggests many had probably not settled on a trades career path while in secondary school and yet still followed a vocation education pathway and/or avoided possible failure in academic courses.

The cumulative grade point averages (CGPA) for both the focus and comparison groups were 0.26 and 0.40 below the provincial average of 2.90. Both groups had their highest CGPAs in

the non-academic subject areas and, as in course selection, this was mirrored by the trades analysis results. The highest CGPA results overall and by subject area were recorded by the focus group in the careers subject area. The focus group outperformed the comparison group with a CGPA of 2.64 vs. 2.50 and in all seven subject areas. The consistently higher CGPA of the focus group could be related to the fact that all of focus group subjects had chosen and started a career path in the trades. Research indicates that when students have decided on a career path the transition to the workforce becomes shorter and more transparent (Furlong & Cartmel, 1997; McMillan & Marks, 2003). The increased transparency of the transition path may afford some individuals more clarity as to the purpose of their secondary school courses when linked to their career goal. The individuals may see the relevance of their education and therefore focus more and try harder.

The six-year completion graduation rates of the (eligible) focus and comparison groups were almost the same and 3% less than the provincial average of 79.6%. The aboriginal six-year completion graduation rate of 58.5% for the focus group and 61.2% for the comparison group, however, are at least 10% higher than the provincial average of 48.2%. The special needs cohorts did even better with graduation rates of 66.8% for the focus group and 72.1% for the comparison group. They are at least 15% higher than the 2011 provincial average of 45.4%. The lower graduation rates of the focus groups were probably influenced by the fact that the aboriginal and special needs cohorts were almost twice the size of those in the comparison group. Thus, there was less chance for self-selection in the focus group, which suggests a broader range of subject abilities, commitment and interest levels. The significantly higher than provincial average graduation rates of the aboriginal and special needs cohorts could be attributed to the availability of youth apprenticeship programs. The youth apprenticeship programs provided focus group participants with a viable alternate graduation pathway. The findings of this study seem to agree with other

research that suggests students found more relevance in a vocationally oriented course load that helped them transition to the workforce directly from secondary school (McFarland & Vickers, 1994; OECD, 2000).

Changes to secondary school grade 11 and 12 programming to allow students to begin a career in the trades while still in secondary school may help to shorten the transition into the workforce. The programming might have provided some of the impetus for students to get better grades and helped some aboriginal and special needs who tend to be marginalized in regular academic programming to shine as well as improve their course marks and graduation rates. The question is whether this success continues after completing secondary school when many of the support mechanisms in the education system are no longer there. Specifically, how many of the focus group subjects will complete their apprenticeships? For those who eventually move on to other careers, will they stay in fields related to their trade? How many will go in a new direction? Future research needs to examine these questions. Future research also needs to delve deeper into the Ministry of Education records of the apprentices in this study (especially the aboriginal and special needs cohorts) to determine the grade 11 and 12 course combinations students take in each of the subject areas to help guide future youth apprentices.

I believe the focus and comparison groups in this study could form the core of a longitudinal study to find answers to the questions above. The post-secondary education records for the two groups (supplied by the B.C. government-sponsored Student Transitions Project and the industry training records supplied by the ITA) could provide insight into future career choices of the some of the individuals in this study. This future analysis could provide some answers to the questions above.

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Appendix 1: Glossary of Terms

- *ACE IT (Accelerated Credit in Industry Training)*

A Ministry of Education and Industry Training Authority youth apprenticeship program that provides first level technical training and secondary school graduation course credits to eligible secondary school students.

- *Apprenticeship*

A form of post-secondary education that combines paid, work-based training (about 85% of training), with technical training in a classroom or shop setting (about 15% of training). Successful completion of both components, along with examinations, is required to earn a certificate or ticket, and become a certified tradesperson. The length of an apprenticeship can range from one to five years, but most require four years to complete.

- *Comparison Group*

Subjects in the study that registered in an apprenticeship after leaving secondary school. Group size is 9,552.

- *Focus Group*

Subjects in the study that registered in the Secondary School Apprenticeship Program (SSA) and/or the Accelerated Credit Enrolment in Industry Training (ACE IT) while attending secondary school. Group size is 13,357.

- *ITA (Industry Training Authority)*

The Industry Training Authority is the provincial Crown agency responsible for overseeing B.C.'s industry training and apprenticeship system.

- *SSA (Secondary School Apprenticeship)*

A Ministry of Education and Industry Training Authority Youth apprenticeship program. Secondary school students are registered with the ITA as apprentices with a sponsor–employer collecting work-based training hours as part of trade certification. The SSA program is comprised of four Ministry of Education Authorized SSA courses (11A, 11B, 12A, 12B).

- *Technical Training*

The theoretical portion (usually about 15%) of an apprenticeship. Short duration courses for apprentices through an ITA-designated training institution.

- *WBT (Work-Based Training)*

The on-the-job portion of an apprenticeship. Hours of on-the-job training as an apprentice under the supervision of a certified journeyman/sponsor–employer recorded by the ITA towards trade certification.

Appendix 2: Codes and Definitions

COLUMN NAME	VALUES	DEFINITION	SOURCE
TRUE_PEN	NNNNNNNNN	<p>The Personal Education Number (Unique Identifier) of the student. This variable includes all "corrections" involving the merging multiple PENS into one for one child, or de-merging one PEN into multiple if it is discovered that there are actually two or more children with the same PEN number.</p> <p>A small number (4) of apprentices have been assigned two PENS. These are treated as separate students for the purpose of research. The relevant TWIDs are 342115, 347562, 370507, 393253.</p>	MED
TWID	NNNNNN	<p>ITA user ID.</p> <p>While this is intended to be a unique identifier, some students have been assigned multiple TWIDs (433 in the 2010 file). For the purpose of research, these are treated as the same student where they are associated with a single PEN. The trade enrolment information associated with each TWID is included.</p>	ITA
BIRTHDATE	YYYYMMDD	The birth date of the student.	MED where available, otherwise ITA
GENDER	F M	The gender of the student.	MED where available, otherwise ITA
ADDRESS1_MED	Text	The first line of the student's street address.	MED
ADDRESS2_MED	Text	The second line of the student's street address.	MED
CITY_MED	Text	The name of the student's school or town.	MED
POSTAL_MED	CNCNCN	The postal code of the student's Canadian address.	MED
ADDRESS1_ITA	Text	<p>The first line of the apprentice's street address. This is the address that is associated with:</p> <ol style="list-style-type: none"> 1) the most recent STARTDATE, and; 2) DATASOURCE '2' where available, otherwise DATASOURCE '1'. 	ITA
ADDRESS2_ITA	Text	<p>The second line of the apprentice's street address. This is the address that is associated with:</p> <ol style="list-style-type: none"> 1) the most recent STARTDATE, and; 2) DATASOURCE '2' where available, otherwise DATASOURCE '1'. 	ITA

COLUMN NAME	VALUES	DEFINITION	SOURCE
CITY_ITA	Text	The city of the apprentice. This is the most city that is associated with: 1) the most recent STARTDATE, and; 2) DATASOURCE '2' where available, otherwise DATASOURCE '1'.	ITA
POSTAL_ITA	CNCNCN	The postal code of the apprentice. This is the postal code that is associated with:1) the most recent STARTDATE, and;2) DATASOURCE '2' where available, otherwise DATASOURCE '1'.	ITA
STARTAGE	Number	The age of the apprentice at the start of their program. It was calculated using STARTDATE and BIRTHDATE. Includes values 10 to 31, plus -1 and -81	ITA
SPONSOR	Text	The apprentice's employer/sponsor organization.	ITA
SPONSORCITY	Text	The city of the sponsor.	ITA
APPRENTICESHIPID	Number	A 6-8 digit number to identify the apprenticeship program(s) in which a student was enrolled. A student enrolled in multiple trades programs will have a different APPRENTICESHIPID for each program. Used only with the AIMS system, prior to 2009.	ITA
PROGRAMTYPE	ACE IT Apprenticeship SSA	Used to derive column YOUTHPROGRAM. Where PROGRAMTYPE = 'ACE IT' or 'SSA' then YOUTHPROGRAM = '1'. Only applicable to 2009 Direct Access Data.	ITA
PROGRAMNAME	Text	Only applicable to 2009 Direct Access data. Does not match with earlier data. Contains 153 values, including blank.	ITA
APPSTATUS	ACTV ACTIVE CERT DEREG INAC PENGRD PRGCMP TERM	The Apprentice Status of the student. There is some overlap of definitions due to the 2 sources of ITA data. ACTIVE and ACTV = Active TERM, DEREG, INAC = Terminated / Deregistered / Inactive PENGRD = pending graduation. For Youth Programs only. CERT and PRGCMP = Certified/Program Complete	ITA

COLUMN NAME	VALUES	DEFINITION	SOURCE
TRADECODE	Number, 1-325	The number that corresponds with TRADENAME.	ITA
TRADENAME	Text	The name of the apprenticeship trade.	ITA
SSA	AINTY	This flag is used to derive values for the column YOUTHPROGRAM. Where SSA = 'A', 'I' or 'Y' then YOUTHPROGRAM = '1'. Where the record is 'N' or blank then YOUTHPROGRAM = '0'. A = Currently Active in the youth program or completed I = Incomplete. They were in the program but too much time has passed for them to continue as a youth apprentice N = Not in a youth program T = not sure where this came from. I am looking into this Y = Active in the program Blank = Not in a youth program	ITA
ACEIT	A I N T Y	This flag is used to derive values for the column YOUTHPROGRAM. Where an apprentice's record is equal to 'A', 'I' or 'Y', YOUTHPROGRAM = '1'. Where the record is 'N' or blank, YOUTHPROGRAM = '0'. A = Currently Active in the youth program or completed I = Incomplete. They were in the program but too much time has passed for them to continue as a youth apprentice N = Not in a youth program T = not sure where this came from. I am looking into this Y = Active in the program Blank = Not in a youth program	ITA
YOUTHPROGRAM	0 1	Indicates whether the apprentice has participated in a youth apprenticeship program, either SSA or ACEIT. It is derived from columns SSA, ACEIT, and PROGRAMTYPE in the 2009 data. 0= The student has not participated in SSA or ACEIT 1= The student participated in SSA or ACEIT, or both The value is '1' if: 1) SSA = 'A', 'I' or 'Y', OR 2) ACEIT = 'A', 'I' or 'Y', OR 3) PROGRAMTYPE = 'ACE IT' or 'SSA' Otherwise, the value is '0'.	ITA

COLUMN NAME	VALUES	DEFINITION	SOURCE
EXPIRYDATE	YYYY-MM-DD	For cases where APPSTATUS = 'COMP' or 'PRGCMP' (completed) this is the date that the student's completed status was entered into the ITA system. In other cases this date is an estimation of predicted completion date based on program length.	ITA
LEVELID	012345	The highest level of apprenticeship classroom training completed, as recorded on receipt of successful class marks. Only available for 2009 new registrants (Direct Access data source). Level 0 to 5 or blank. For example, if an apprentice is in a three year program with three levels of technical training, then a value of '3' means the third level of technical training is completed.	ITA
WBTCOLLECTED	Number	The student's reported work based hours. Only available for 2009 new registrants (Direct Access data source).	ITA
STARTDATE	YYYY-MM-DD	This is the date that the apprentice began his/her apprenticeship program.	ITA
STARTYEAR	YYYY, 2000 to 2009	The year that the apprentice began his/her apprenticeship program.	ITA
DATASOURCE	1 2	The ITA source system for student records. The source changed in 2009. 1= AIMS (2005-2008 new registrants) 2= Direct Access (2009 New Registrants)	ITA
SCHOOL_YEAR	YYYY/YYYY	The school year of the course result. Prior to 2007/2008, this referred to the TRAX school year, or 12 month period commencing on September 30 and ending the following September 29. After 2007/2008, this refers to the legal school year that commences on July 1 and ends the following June 30.	MED
DISTRICT_NUMBER	NNN UNKNOWN	For examinable courses, this is the three-digit identifier assigned to the school district to which the Provincial Examination result is attributed. For non-examinable courses, this is the three-digit identifier assigned to the school district based on the school that delivered the course. DIAND = Department of Indian and Northern Affairs UNKNOWN = Unspecified School District UNSIATH = Unspecified Independent School Authority	MED

COLUMN NAME	VALUES	DEFINITION	SOURCE
MINCODE	NNNNNNNN NNNNNNNN-YYYYMMDD	For examinable courses, this is the eight-digit identifier assigned to the school to which the Provincial Examination result is attributed. For non-examinable courses, this is the eight-digit identifier assigned to the school that delivered the course in question. UNKSCL = Unknown School	MED
SCHOOL_NAME	Text	For examinable courses, this is the name of the school to which the Provincial Examination result is attributed. For non-examinable courses, this is the name of the school that delivered the courses in question. Includes UNKNOWN SCHOOL.	MED
COURSE_GRADE	10 11 12	The course grade level. This indicates the grade level of the course, but not necessarily that of the student. UNK = Unknown	MED
COURSE_CODE	Text	The short code for the course that the student took. For examinable courses, the code represents the combined curriculum to which the Provincial Examination applied. This is typically the Ministry standard course code (English version), an underscore character (_), the course grade, and "_C" appended to the end. For non-examinable courses, this is the standard Ministry course code, an underscore (_), and the course level.	MED
COURSE_DESC	Text	The description of the course that the student took.	MED
COURSE_PERCENT	Number, 0-100	The mark that the student achieved on the course. Prior to 1994, the TRAX system only recorded the letter grade for a course. For this reason, some students have a percent score of zero but a valid letter grade value.	MED

COLUMN NAME	VALUES	DEFINITION	SOURCE
COURSE_LETTER_GRADE		<p>The course letter grade achieved by the student on the course in question.</p> <p>A = 86% to 100% B = 73% to 85% C+ = 67% to 72% C = 60% to 60% C- = 50% to 59% F = 0% to 49%</p> <p>SG = Standing Granted TS = Transfer Standing US = Unspecified</p>	MED
EXAM_PERCENT	Number, 0-100	<p>The exam mark of the student as reported by the TRAX system for the Provincial Examination.</p> <p>Where the course did not include an exam component, this field is blank.</p>	MED
FINAL_PERCENT	Number, 0-100	<p>The final mark of the student as reported by the TRAX system. The final mark is based on the blend of a student's best course mark and best exam mark. These best marks may have been earned in different school years. Final marks may be greater than either the best exam marks or best course marks observed in the reported year. The final marks are usually derived from a blend of the best exam percent and the best course percent, using a 80/20 mix for grades 10 and 11, and a 60/40 mix for grade 12. (The sole exception is BC First Nations Studies 12, or FNS12, which alone of all grade 12 examinable courses uses the 80/20 mix.) In cases where the course did not include an exam component, the final_percent is equal to the course _percent.</p>	MED