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A Structured Conceptualization of Reasons to Accelerate: Words from the WISE

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A thesis submitted in partial fulfillment of the requirements for the degree in Master of Education

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Abstract

Existing research indicates that carefully planned acceleration offers academic benefits with little social or emotional risk to high-ability learners. However, acceleration is seldom practiced and little is known about how students perceive acceleration. This study provides a structured conceptualization of reasons why secondary students chose acceleration through concurrent enrollment. Participants who were concurrently enrolled at Western University while in their final year at high school completed a concept mapping exercise based on Trochim's methodology. A seven cluster model provided the best graphical representation of reasons to choose concurrent enrollment. Key concepts included (a) university preparation, (b) demonstrating initiative, (c) getting ahead, (d) love of learning, (e) self-fulfilment/elitism, (f) seeking challenge and (g) networking. Educational, research and concurrent enrollment program implications are discussed.

Keywords: concurrent enrollment, Trochim's concept mapping, structured conceptualization, acceleration, gifted

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Chapter 1: Introduction and Literature Review

Over 100 years of research around the world has demonstrated that acceleration is the most effective programming option to meet the unique educational needs of high-ability learners (Colangelo, Assouline & Gross, 2004a). However, resistance towards acceleration remains strong among educators (McCoach, & Siegle, 2007; Southern, Jones & Fiscus, 1989) and misinformation about the practice persists (Smutny, Walker & Meckstroth, 2007; Wood, Portman, Cigrand & Colangelo, 2010). As a result, acceleration is seldom implemented and often controversial, especially so in Canada (Kanevsky, 2011b). Consequently, there is a paucity of research involving accelerants in Canada and very few studies examine the practice from the students' perspective. To address this gap in the research and to provide feedback on a unique accelerative program, this study engaged accelerated students in a structured conceptualization process. Through Trochim's concept mapping methodology (Trochim, 1989), high-ability secondary students shared their motivations to self-select acceleration through concurrent enrollment in university. The research question for this study was, "What reasons do high-ability secondary students give for choosing acceleration?"

This thesis is divided into five chapters. Following this introductory chapter and literature review, chapter two includes a description of the accelerative program from which study participants are drawn and background to the study methodology. In chapter three I describe the study method, including procedures and analysis. Results are presented in chapter four, organized by major categories. Chapter five provides a discussion of the results, including study limitations, implications for future research and implications for concurrent enrollment programs.

The purpose of this study was to give voice to high-ability students who chose an accelerative option known as concurrent enrollment. Through this literature review I will outline the research on the educational practice of acceleration and demonstrate the gap that this study addresses. To provide context, I will begin this introductory chapter by briefly discussing programming options for high-ability learners. Next I will describe the basis for acceleration, various types of acceleration and describe what we know about opportunities to accelerate. Then I will discuss what the literature tells us about attitudes towards acceleration, review the type of acceleration known as concurrent enrollment, and consider the applicability of Self-Determination Theory to this study, concluding with a summary of the study rationale.

Programming for High-ability Learners

Various expressions such as "gifted", "talented", "creative" and "high-ability" are used to describe people who are capable of high performance (Rogers, 2002; Steenbergen-Hu & Moon, 2011). In the past, "giftedness" was narrowly defined as high intellectual performance, and was measured by using the top 2% as a cut-off score on traditional IQ tests (Winzer, 2002). Today, a wider definition encompassing intellectual abilities, talents, and intrinsic motivation is increasingly accepted within the field of education (Gottfried, Gottfried, Cook & Morris, 2005). In this paper I have chosen to use the term "high-ability learner" because it focuses on the potential of academically able students and it de-emphasizes restrictive definitions of giftedness (Steenbergen-Hu & Moon, 2011). It is also a term that is well-accepted within the field of gifted education. Furthermore, the term "high-ability" is most appropriate for any examination of acceleration as a programming option. In fact, the National Work Group on Acceleration recommends that referral for acceleration should function as a separate process from referral to

gifted programming because students who do not fit narrow criteria for "giftedness" may still be ideal candidates for acceleration (Colangelo et al., 2010).

It is well recognized among educators and educational researchers that high-ability learners have special learning needs that differ from the learning needs of typical students. In general, high-ability learners tend to be more curious, think more abstractly and learn at a faster rate than their age-mates (Feldhusen, 1982; Winzer, 2002). Preferably, programming for these students should provide opportunities to allow these students to reach optimum learning levels (Edmunds & Edmunds, 2008; Feldhusen, 1982). Conversely, when the educational needs of high-ability learners are not met they often experience frustration and boredom in school (Colangelo et al., 2004a), a situation which can lead to disengagement (Olenchak, 1999). One way to accommodate students who demonstrate ability to learn at a faster pace is through acceleration (Colangelo et al., 2004a; Lubinski, 2004), a programming option that can take many forms (Kanevsky, 2011b; Southern & Jones, 2004).

Foundations and Types of Acceleration

Pressey (1949, p. 2) defined acceleration as "progress through educational programs either at rates faster than, or at ages younger than conventional". More recently, the National Association for Gifted Children (NAGC, 2004, para. 2) presented a refined definition, "allowing a student to move through traditional educational organizations more rapidly, based on readiness and motivation." This definition reflects student-centred educational practice, taking into account whether acceleration is a good fit for a student, and whether that student is motivated to learn at a faster pace.

Programmed acceleration is geared towards the student's capacity to learn (Southern & Jones, 2004) and provides appropriate pacing for high-ability learners (Little, 2012). In addition

to matching curriculum pace to ability, acceleration may help to avoid boredom by teaching high-ability students "only what they don't already know" (Stanley, 2000). For school systems seeking programming options for high-ability students, acceleration can be a cost effective alternative as it utilizes existing curricula and moves the student through the system more quickly (King, 2012).

Some researchers label the practice of adjusting curriculum pace to match student learning as appropriate developmental placement (Lubinski & Benbow, 2000) or developmentally appropriate teaching practice (McConnaha, 1997) rather than acceleration. Lubinski and Benbow (2000) argued that just as students who are developmentally delayed require the pace of the curriculum be adjusted to their needs, high-ability students also deserve appropriate placement. They applied the theory of work adjustment, a theory proposed for adults in the work force, to students and their educational adjustment. According to theory of work adjustment, educational adjustment involves competence and fulfillment. Competence, or the degree of satisfactoriness, is governed by how well a student's abilities fit the ability requirements of the environment. Fulfillment, or satisfaction, occurs when personal needs correspond to the rewards provided by the environment. When these two dimensions co-occur, the person and environment act in harmony, a condition which fosters a long-lasting, stable relationship.

According to theory of work adjustment, optimal development occurs in an educational setting when students' needs are met and their abilities are challenged (Lubinski & Benbow, 2000). The educational implications of theory of work adjustment suggest that educational programming should seek a harmonious match between high-ability students and their learning environments in order to engage these students in a meaningful educational career. This

harmonious match can be achieved by modifying the curriculum according to students' learning preferences, including provision of accelerative options for high-ability students who are motivated and ready for a quicker pace (Kanevsky, 2011a).

Although acceleration is often thought of as grade-skipping, in practice it can take many forms which may be programmed singly or in combination (Rogers & Kimpston, 1992). Southern and Jones (2004) defined eighteen types of acceleration, which may be classified as content-based or grade-based (Kanevsky, 2011b). Table 1 provides a brief description of each of these types. Typically, content-based acceleration involves increasing the rate at which new material is presented, whereas grade-based acceleration involves moving students into settings with older students. In practice, overlap exists between the two types depending on how the acceleration is programmed. For example, Kanevsky (2011b) classified concurrent enrollment as content-based acceleration, but this form of acceleration may involve the student taking courses with older students. Accelerative options may be undertaken singly or in combination, and students may engage in different types of acceleration over the course of their school career.

Before implementing any accelerative option, careful consideration of the individual student and environment must be made. Decision-makers, including educators and parents, must be mindful of the student's academic profile, socio-emotional development and personal preferences (NAGC, 2004). Ideally, decisions about acceleration should be informed by research and reflect best-practices (Colangelo et al., 2010). In the next section, I will summarize two meta-analyses of acceleration research and then describe opportunities to accelerate, before introducing the literature on how attitudes towards acceleration can affect decision-making.

Table 1

Types of Acceleration

Type of Acceleration	Description
Content-based acceleration	
Advanced placement	Student takes standardized post-secondary courses, generally offered through their high school
Concurrent enrollment	Student is enrolled at one level, but takes a course at a higher level
Correspondence courses	Student takes advanced coursework beyond normal school instruction
Credit by examination	Student "challenges" a course for credit
Curriculum compacting	Introductory, drill and practice activities are reduced resulting in more instructional time for advanced content
Extracurricular programs	Student takes courses outside of regular school hours (evenings, weekends, summer programs).
International Baccalaureate Programs	Interdisciplinary curriculum set by the International Baccalaureate Organization, internationally recognized
Mentoring	Student is paired with a mentor or expert tutor for advanced instruction
Single-subject or subject matter acceleration	For one or more subjects, student is either placed in classes with older peers or works with materials from higher Grades

(Table 1 continues)

(Table 1 continued)

Type of Acceleration	Description
Grade-based acceleration	
Combined classes	Often called "split grades", students in two or more consecutive grades are enrolled in one class
Continuous progress	Student is given content according to own pace of progress – results in acceleration when the student progresses more rapidly through the material than his/her age mates
Early admission to Kindergarten	Students enter Kindergarten at a younger than regular age
Early admission to Grade 1	Students enter Grade 1 at a younger than regular age
Early entrance to middle school or high school	Student is moved ahead of chronological-age peers at transition to middle or high school
Early graduation from high school	Student graduates from high school in 3 ½ years or less; may be accomplished by increased coursework, concurrent enrollment, extracurricular and/or correspondence courses.
Grade-skipping	Student is placed one full grade ahead of his/her age mates at any time during his/her school career
Self-paced instruction	Similar to continuous progress, but the student has control over pacing decisions
Telescoping curriculum	Similar to curriculum compacting, except reduced instruction time results in advanced grade placement

Background Research on Acceleration

Many researchers have studied the educational practice of acceleration, resulting in numerous quantitative studies on the effects of acceleration. In general, research has focused on two areas of impact – academic achievement and social/emotional adjustment. Two meta-analyses, written by prominent authors in the field of gifted education, are worthy of mention because of the comprehensive summaries they provide. Colangelo et al. (2004b) examined studies conducted between 1932 and 1991 and found that accelerants consistently out-performed non-accelerants in measures of academic achievement (median Cohen's effect size = 0.8). Social and emotional measures, including educational plans, liking for school, participation in activities, and self-acceptance/personal adjustment, tended to produce mixed but mostly small effect sizes (from -0.41 to 0.77). More recently, Steenbergen-Hu and Moon (2011) examined 38 studies on acceleration conducted between 1984 and 2008 and found positive effects for academic achievement (Hedge's g effect size = 0.396) and social-emotional adjustment (Hedge's g effect size = 0.141) comparing accelerated to non-accelerated same-age peers. Based on the research, it can be strongly argued that high-ability students benefit from accelerative practices and that acceleration options should be readily available. However, as discussed in the section below, opportunities to accelerate remain scarce. Thus, the current study on how students view concurrent enrollment offered insight into why learners actively choose this option.

Opportunities to Accelerate

Despite the research demonstrating positive academic outcomes for accelerants, few opportunities to accelerate exist. In a recent nationwide survey, the first attempt to quantify opportunities to accelerate across Canada, Kanevsky (2011b) examined to what extent different forms of acceleration were permitted and practiced during the 2006-2007 school year. Support

for and practice of acceleration was found to be inconsistent, with boards tending to espouse support for acceleration without having accelerants within their board. At the provincial level, the Association for Bright Children (ABC) of Ontario surveyed school boards across Ontario on their gifted education policies (ABC, 2011). Out of thirty respondents, only five school boards had a policy on acceleration. ABC identified only one example of concurrent enrollment available in Ontario: the Western Initiative for Scholarly Excellence (WISE) program. Taken together, these findings indicate that programs actively supporting acceleration of high-ability students are rare and therefore worthy of attention. Much can be learned from those who do experience acceleration and it is especially valuable to conduct research in an environment where such opportunities are infrequent. Participants for this study were drawn from WISE, a unique accelerative program for high-ability secondary students.

In an educational environment where accelerative opportunities are proven to be beneficial and yet remain rare, researchers have attempted to understand this discrepancy by examining educators' attitudes towards acceleration. Attitudes towards acceleration are relevant to this study because recommendations about acceleration often originate from teachers (Rambo & McCoach, 2012). A brief overview of research findings on attitudes towards acceleration is presented in the following section, providing contextual background to the decision to accelerate.

Attitudes towards Acceleration and the Decision to Accelerate

High-ability students are a decidedly diverse group (Rogers, 2002). As mentioned, decision-makers must seek the best possible match between the student and the accelerative option when considering acceleration. Ideally, the decision to accelerate is made jointly by parents, educators and the student, working together as a team to meet the best interests of the student (Colangelo et al., 2010). As these decision-makers work together, their attitudes towards

acceleration inevitably play a role. Within the team, educators are often the source of information about accelerative options - parents may turn to educators for information on educational options for their high-ability child (Yoo & Moon, 2006) and conversely, educators may seek to involve families in the planning process (Hertzog & Bennett, 2004).

Educators' attitudes towards acceleration are well-documented (Bain, Bliss, Choate & Brown, 2007; Rambo & McCoach, 2012; Southern, Jones & Fiscus,1989; Wood, Portman, Cigrand & Colangelo, 2010) and generally reflect concern regarding social interactions and socialization skills. These concerns persist despite research showing that acceleration has little effect on social and emotional measures (Colangelo et al., 2004b; Steenbergen-Hu & Moon, 2011). Teachers' skepticism toward acceleration can bias expectations for accelerants (Hoogeveen, van Hell & Verhoeven, 2005) and influence the decision to accelerate (Rambo & McCoach, 2012).

In the field of gifted education, few studies address the role of parents in their children's education (Moon, Kelly & Feldhusen, 1997; Morawska & Sanders, 2008). Although some studies investigate the influence of family environment on high-ability children (Garn,, Matthews & Jolly, 2010; Schilling, Sparfeldt & Rost, 2006; Sowa & May, 1997), I was unable to locate a single study which systematically examined parents' attitudes towards acceleration per se.

My review of published research revealed that few studies have directly investigated students' attitudes towards acceleration, although some information on their attitudes may be gleaned from the literature. One recent study with high-ability students in grades 3 to 8 (n = 416) showed they rate acceleration as one of the most desirable practices in educational programming (Kanevsky, 2011a). High-ability students "disliked waiting for others to catch up and wanted to

learn with students who matched their pace in order to maintain a motivating, developmentally appropriate level of challenge" (Kanevsky, 2011a, p. 295). In a 10-year longitudinal study involving 320 profoundly gifted students, more than half (57%) took college courses while still in high school (Lubinski et al., 2001). Most students (71%) expressed favourable attitudes towards acceleration and among those who were dissatisfied with their accelerated studies most wished they had more opportunities to accelerate. Although these studies suggest students hold positive attitudes towards acceleration, they do not systematically analyze students' specific motivations to accelerate if given the option.

While it may be appropriate for educators and parents to make informed decisions on behalf of younger children, involving students in educational decisions becomes increasingly important as the student matures. Secondary students considering concurrent enrollment in university are ideally situated to be active in the decision-making process as they prepare for next steps after high school graduation. In the following sections, I will summarize existing research on this particular type of acceleration.

Concurrent Enrollment

As previously mentioned, "concurrent enrollment" (or "dual enrollment") means a student is enrolled in two levels of schooling at the same time (Kanevsky, 2011b). For example, when a student is working towards a university credit while simultaneously working towards a high school diploma, s/he is concurrently enrolled in both high school and university and earning separate credits at each level. In this study, I use the term concurrent enrollment to avoid confusion with Ontario Ministry of Education dual credit programs. (Students enrolled in an approved dual credit program take a single course that counts towards both high school diploma

and college credit.) The literature review in this section culminates in a list of perceived benefits of concurrent enrollment which will be compared to the findings of this study.

Concurrent enrollment differs from Advanced Placement and International Baccalaureate accelerative programs for high-achieving secondary students in that concurrently enrolled students take genuine university courses rather than courses designed for high school students (Poelzer & Feldhusen, 1997). University courses are generally regarded to be at an academic level above that offered in high school (McConnaha, 1997). Although some recent literature describes state-subsidized dual enrollment programs implemented across the United States in response to the No Child Left Behind Act of 2001 (Dodge, 2012; Dutkowsky, Evensky, & Edmonds, 2006; Jordan, 2001), these studies do not address programs for high-ability students. In fact, very few studies have systematically investigated concurrent enrollment for this population (Rogers, 2008; Swanson, 2010). Kanevsky's (2011b) study on policies and practices provides some insight into the lack of research on this topic.

In her survey of acceleration practices in Canada, Kanevsky (2011b) found just over one quarter (26.1%) of school boards across the country reported students participated in concurrent enrollment in the 2006-2007 school year. Among provinces with more than 150,000 students, participation rates varied between 5.9% in Quebec to 53.1% in British Columbia. Ontario had the second highest participation rate with one out of three (29%) school boards having at least one student concurrently enrolled during the school year. However, these rates may not be truly representative. The overall survey response rate was 44.5%, meaning less than half of all school boards responded, and the researchers suggested that those who did respond "represented the districts that were most actively engaged in acceleration" (Kanevsky, 2011b, p. 173). Also, boards needed to have only one student engaged in concurrent enrollment to count as having

participated in that form of acceleration. Perhaps the paucity of research is a reflection of the rarity of concurrent enrollment practices. The current study begins to address this gap in the literature.

Among the published research, I did find two studies involving primary research on concurrent enrollment for high-ability students. Wolf and Geiger (1986) surveyed students, parents and high school counsellors at three U.S. universities to assess experiences with concurrent enrollment. Among responses from 212 study participants, the two reasons most often given for participating in concurrent enrollment were "to reduce boredom in high school" and "to get a head start in college". In considering the study results, Wolf and Geiger (1986) noted three strengths; concurrent enrollment: (a) gives high school students access to a wider variety of courses, (b) offers an alternative way to meet the needs of high achieving students, and (c) provides an opportunity for improved communication between school systems and post-secondary institutions.

The second study I found on concurrent enrollment for high-ability students was qualitative, comprising semi-structured interviews with 20 students in a previously undocumented dual enrollment program at the University of Chicago (McConnaha, 1997). The study aimed to provide a psychoeducational profile of students in the program. Results showed dually enrolled students were highly motivated and had positive attitudes and self-concepts. However, further investigation is needed to reveal precise motivations for these students to engage in concurrent enrollment.

An examination of the broader literature base, including discussion papers on the move toward dual enrollment in the U.S. (Dodge, 2012; Dutkowsky, Evensky, & Edmonds, 2006; Jordan, 2001), revealed a number of proposed benefits to post-secondary institutions, high

schools and students involved in concurrent enrollment programs. Among post-secondary institutions, these programs can "acquaint high school students with the university" (Wolf & Geiger, 1986, p. 220). Universities may utilize this relationship-building with prospective applicants as a recruitment strategy. At the secondary school level, high schools may seek out concurrent enrollment programs to expand the range of educational opportunities they can offer their highly able students (Karnes & Chavin, 1982). Most relevant to this study are benefits to students. Identified benefits include the following:

- exposure to more challenging, advanced curriculum content (Rogers, 2002)
- opportunity to engage in a wider range of academic courses than available through the local high school (Dodge, 2012; Karnes & Chauvin, 1982; Wolf & Geiger, 1986)
- opportunity to pursue specific academic areas of interest in greater depth (Rogers, 2002)
- exposure to university life helps familiarize students the with demands and expectations of university level work (Wolf & Geiger, 1986)
- shorter length of time spent in post-secondary education due to earning university credits while still in high school (McConnaha, 1997)

By comparing these identified benefits to students' reasons for participating in WISE, we can determine whether participants in this study viewed these posited ideas as important benefits.

In considering the factors that influence reasons to accelerate, one further piece of the puzzle is the link between high-achievers and motivation. Motivation theory forms a useful conceptual framework to understand what drives people to do the things they do. In the following section, I will review self-determination theory and describe how it applies to this study.

Self-Determination Theory

There are several theories and models of motivation (e.g. expectancy-value theory, goal theory, attribution theory), the most current are based upon a cognitive view that assumes individuals have a conscious awareness when making choices about their behavior (Clinkenbeard, 2012). I have chosen Deci and Ryan's (1985) self-determination theory to guide this study because it has been thoroughly researched within the field of education (e.g. Niemiec et al, 2006; Patrick, Skinner & Connell, 1993; Roth, Assor, Niemiec, P., Ryan & Deci, 2009; Ryan, Stiller & Lynch, 1994) and it describes the supports necessary to foster the self-determined motivation (Clinkenbeard, 2012) that has been linked to academic achievement (Gottfried, Gottfried, Cook & Morris, 2005; Vallerand, Gagné, Senécal & Pelletier, 1994.) When applied to education, self-determination theory is concerned with the factors that promote in students "genuine enthusiasm for learning and accomplishment and a sense of volitional involvement in the educational enterprise" (Deci, Vallerand, Pelletier & Ryan, 1991, p. 325). Therefore, self-determination theory provides a suitable framework for this study of volitional involvement in concurrent enrollment. Self-determination theory describes two basic types of motivation: intrinsic and extrinsic. Intrinsic motivation comes from internal interest or enjoyment in a task whereas extrinsic motivation is dependent upon the performance of the task for reward or outcome (Garn, Matthews & Jolly, 2010). In this study, an example of intrinsic motivation would be a student spending leisure time on academic work for pure enjoyment. In contrast, an example of extrinsic motivation would be a student engaging in a course because it is free. Educators recognize intrinsic motivation as an important phenomenon because it "results in high-quality learning and creativity" (Ryan & Deci, 2000, p.55).

Research with high-achieving students has found that, in general, they score higher on measures of academic intrinsic motivation than cohort comparison groups. In a longitudinal study with 104 students, Gottfried, Gottfried, Cook and Morris (2005) compared adolescents with high academic motivation to a cohort comparison group and found that those with high academic motivation had higher math and reading achievement on Woodcock-Johnson standardized tests and higher grade point average in high school. Vallerand, Gagné, Senécal and Pelletier (1994) compared intrinsic motivation of gifted and regular elementary students (n = 135) using Harter's Intrinsic/Extrinsic Orientation Scale. Gifted students showed higher levels of intrinsic motivation than the comparison group. Taken together, these results gave rise to the expectation that participants in this study, high-achieving students who self-select acceleration, were likely to cite reasons that stem from intrinsic motivations for their participation in concurrent enrolment.

The division between intrinsic and extrinsic motivations is a high-level distinction, based on whether behaviour is undertaken because an activity is inherently interesting (intrinsic) or has a separate consequence (extrinsic). Self-determination theory expands this division by proposing various sub-types of extrinsic motivation which vary in degree of autonomy (Ryan & Deci, 2000). In this view, extrinsic motivation exists along a continuum. At the lowest level of autonomy, behaviour is externally regulated and prompted by external reward, such as free tuition. At the highest level of autonomy, reasons for externally rewarded behaviour become internalized. The person acts for external reasons that are integrated into that individual's set of goals based on values and needs. To give a contextual example, a student who engages in educational activities because s/he believes it to be valuable for his/her chosen career is extrinsically motivated, but s/he acts with a self-endorsed feeling of personal choice (Ryan &

Deci, 2000). Self-determined extrinsic motivation is the most desirable form of extrinsic motivation and, like intrinsic motivation, it is autonomous and without conflicting emotions (Ryan & Deci, 2000). It remains distinct from intrinsic motivations because the behaviour is performed because of its "presumed instrumental value with respect to some outcome that is separate from the behaviour" (Ryan & Deci, 2000, p. 62).

Self-determination theory proposes that three conditions promote the development of self-determined motivation: (a) autonomy, the need to feel a measure of control, (b) competence, the need to feel capable within an environment, and (c) relatedness, the need to feel connected with others (Deci & Ryan, 1985). According to self-determination theory, social environment can reinforce or impede tendencies toward engagement and growth depending upon whether the three basic psychological needs are met. We can see a correspondence of ideal conditions described by self-determination theory and theory of work adjustment. Recall, theory of work adjustment proposes that an environment which fosters competence and fulfillment leads to positive educational adjustment. Self-determination theory proposes that a confluence of autonomy, competence and relatedness supports the intrinsic motivation that research has shown to be related to high-achievement. In short, competence is a key factor in fostering both positive adjustment and intrinsic motivation. These theories guide our understanding of the current study results, by framing the findings in terms of the conditions necessary for an ideal educational environment.

Summary of Study Rationale

A review of the research to date revealed the following ideas. High-ability students have special needs which should be met through learner-centered programming. Acceleration is one well-researched way to meet the academic needs of high-ability students. Research into various

sub-types of acceleration varies, with few studies focused on university-level concurrent enrollment for high-ability students (Karp, Calcagno, Hughes, Jeong & Bailey, 2007; Swanson, 2010). Key stakeholders in the decision to accelerate are educators, parents and the students themselves. Although some studies have investigated educators' attitudes towards acceleration (Bain, Bliss, Choate & Brown, 2007; Southern et al., 1989; Wood, Portman, Cigrand & Colangelo, 2010), I was unable to find a study that gave voice to students' reasons for choosing to accelerate. Therefore, it is appropriate that a study of students' reasons for self-selecting acceleration be conducted. These reasons will then be compared to the proposed benefits of concurrent enrollment revealed through this literature review, framed within self-determination theory (Deci & Ryan, 1985) and theory of work adjustment (Lubinski & Benbow, 2000).

The primary purpose of this study was to better understand the phenomenon of concurrent enrollment from the students' perspective and give voice to students who have chosen this accelerative option. The findings illustrate what attracts high-ability learners to engage in concurrent enrollment. Also, this study provides a graphical representation of reasons to choose concurrent enrollment which may contribute to the development of programs for high-ability secondary students. Program planners at Western and other post-secondary institutions can use this information to develop programs that respond to the needs of high-ability students.

As the WISE program has no prior formal evaluation, this study served a secondary purpose; the resulting framework of participants' expectations identified the most attractive aspects of the program. This framework can be used in program planning and development and forms a baseline evaluation of participants' needs. This evaluative component of the study is discussed in the next chapter, along with the program description.

Chapter 2: Program Description and Background on Study Methodology

Given the scant research in the area of concurrent enrollment for high-ability students, an examination of the Western Initiative for Scholarly Excellence (WISE) program provided an excellent opportunity to add to our understanding of this type of acceleration. In this chapter I will provide background on the WISE program and program entry requirements to illustrate the sample frame for this study. Next I will give a brief overview of program evaluation and its applicability to this study. This chapter concludes with a review of the study methodology, Trochim's concept mapping.

Description of Western's Initiative for Scholarly Excellence

Since 1979, Western University has offered a unique accelerative option to high school students – the WISE program. This program gives high achieving students in grades 11 and 12 the opportunity to take one university course while still enrolled in high school. Kanevsky (2011b) categorized this type of acceleration as concurrent enrollment. The program accepts up to 100 applicants each academic year and in 2012-2013, ninety-five students participated. A program coordinator provides one-on-one advice to students who apply to and participate in the program. In addition to completing a university credit, WISE students can meet other program participants and connect with the university through various WISE social events. The WISE program coordinator organizes and manages these events.

To qualify for the WISE program, students must be full-time secondary students working towards completion of their Ontario Secondary School Diploma (OSSD), with a minimum of 22 credits completed. Students must have at least an 85% average in Grades 10 and 11 if they have not taken any Grade 12 courses; if they have one or more Grade 12 university preparation courses, they must have a minimum 80% average in Grade 10, 11 and 12. In addition, they must

be nominated by a principal, guidance counsellor or teacher at their secondary school and be registered in sufficient courses to fulfill university admission requirements. In the context of this study, participants in the WISE program have demonstrated high-ability because they fit the criteria for acceptance into WISE. To be clear, WISE students form a subset of high-ability learners; their high achievement demonstrates high-ability. It should be noted that some learners identified within the educational system as high-ability students do not reach the achievement levels demonstrated by WISE students, and the subset of high-ability, lower achievement learners is not represented in this study.

The university does not charge tuition fees for courses taken through the WISE program; in other words, participation in the program is free and students can earn a university credit without charge. WISE students select a university course from the range of options offered to regular first-year university students. Upon successful completion the course credit is added to the participating student's university transcript. This credit may be applied towards a degree at Western or transferred to another post-secondary institution. WISE students may take courses on campus or through distance education, although the majority of WISE students live within commuting distance of Western's campus in London, Ontario. In consultation with teachers, parents, and the WISE coordinator, students self-select this accelerative option. The importance of educators' attitudes towards acceleration cannot be over-emphasized, as they play a key role in making accelerative decisions (Wood, Portman, Cigrand & Colangelo, 2010). Furthermore, educators are the gatekeepers for accelerants who require permission to accelerate; nomination by an educator is a requirement for entry into the WISE program. It is conceivable that some students choose to participate in WISE because of perceived teacher or parent influences.

Despite the longevity of the WISE program, now entering its thirty-fourth year, and its popularity evidenced by high enrollment numbers, the WISE program has had no formal evaluation. Therefore the opportunity to gather information on acceleration from program participants served a two-fold purpose: to explore students' attitudes towards concurrent enrollment and to provide evaluative feedback to the program coordinator.

Program Evaluation

Program evaluation and academic research share the same research techniques (Vogt, 2007) meaning it is both possible and practical to combine academic research and evaluation within the same study. Evaluators and researchers regularly use the same data collection tools, such as document review, surveys, and interviews, and their corresponding analyses. Indeed, the line the between evaluation and research is fuzzy and hinges more on the intended audience and use of study findings than the techniques involved. In this study, participants were drawn exclusively from the WISE program, so the findings are useful to both research and evaluation audiences.

Program evaluation seeks to determine what a program does, how it does it and whether the outcomes are feasible, effective and intended. Broadly speaking, program evaluation may be categorized as formative or summative, depending on whether the evaluation centres on processes of the program or program outcomes respectively. Within those broad categories, sub-types of evaluation relate to the focus or purpose of the work. Formative evaluation includes the following: needs assessment, evaluability assessment, structured conceptualization, implementation and process evaluations (Trochim, 2006). Summative evaluation includes the following: outcomes, impacts, cost-benefit analysis, secondary analysis and meta-analysis. The type of formative evaluation known as structured conceptualization pertains to this study.

When applied to program evaluation, structured conceptualization can assist stakeholders to "define the program or technology, the target population, and the possible outcomes" (Trochim, 2006). Simply put, the evaluator seeks to understand how a group perceives the phenomenon under investigation (Trochim, 1989). In this study, I sought to understand the many and various reasons that high-ability students have for participating in the WISE program. One way to accomplish this conceptualization was through Trochim's concept mapping. In the following section I will describe this methodological approach in detail.

Background on Trochim's Concept Mapping Methodology

Within the field of gifted education, researchers have used quantitative measures of academic achievement and social/emotional effects to examine the impact of acceleration. Indeed, sufficient evidence has been collected on these two dimensions to justify the meta-analytic studies described in chapter one (Colangelo et al., 2004b; Steenbergen-Hu & Moon, 2011). Data on attitudes toward acceleration has been systematically collected from educators and counselors using survey methodologies (Bain, Bliss, Choate & Brown, 2007; Southern et al., 1989; Wood, Portman, Cigrand & Colangelo, 2010); however, little is known about parents' and students' attitudes towards acceleration (L. Kanevsky, personal communication, February 22, 2013). Among various types of acceleration, research into concurrent enrollment has tended to focus on dual enrollment programs for at-risk students and further research into concurrent enrollment for high-ability learners is warranted. Therefore, to examine how accelerants viewed concurrent enrollment, I needed a methodology that was appropriate for exploratory studies and that gave voice to the students. Ideally, a qualitative approach would allow students to share opinions in their own words but I also wanted a methodology that supported rigorous analysis. Trochim's concept mapping is a process which involves participants in qualitative data

generation and data organization, and so is particularly well suited to the research question in this study. In the following sections, I will describe the strengths of Trochim's concept mapping, provide examples of Trochim's concept mapping studies, and outline the steps involved.

Many researchers have recognised the unique strengths of Trochim's concept mapping as a participatory, mixed method approach and it has been used extensively in exploratory research applications (Cousineau, Franko, Ciccazzo, Goldstein & Rosenthal, 2006; Daughtry & Kunkel, 1993; Goodyear, 2002; Poole & Davis, 2006). It is generally acknowledged that qualitative approaches provide openness and flexibility, attributes that are well suited to areas of new research. Trochim's concept mapping is ideal in exploratory studies such as this investigation because of the highly adaptable approach to gathering participants' unrestrained input. Participants actively contribute ideas in their own words and then organize those ideas through sorting and rating activities (Kane & Trochim, 2007). The researcher facilitates data generation and organization, then completes statistical analyses resulting in a graphical representation of the conceptualization. According to Kunkel et al. (1999, p. 196), Trochim's concept mapping is especially useful in exploratory studies because "it seeks for conceptual rather than statistical significance and for meaning rather than necessary generalizability". Trochim's concept mapping's systematic, participatory approach means it is well-adapted to social research (Rosas & Kane, 2012; Sutherland & Katz, 2005).

Within social research, Trochim's concept mapping is widely used in the areas of health and social work (Rosas & Kane, 2012) and is also applicable to educational research (Everall, Truscott & Paulson, 1999; Trudeau et al., 2011). In one educational application, Kunkel, Chapa, Patterson and Walling (1995) conducted Trochim's concept mapping with students in Grade 7, 8 and 9 to understand how students who are gifted conceptualize what it is like to be gifted.

Trochim's concept mapping has also been used with students in Grades 10 and 12 to facilitate the development of a conceptual framework used in program planning, development and evaluation for the Manitoba School Improvement Program (Sutherland & Katz, 2005). In another example, Daughtry and Kunkel (1993) completed a Trochim's concept mapping study with college age students to understand their experiences of depression. Trochim's concept mapping has been used in both large and small scale projects (Rosas & Kane, 2012) and could accommodate as many participants as are currently enrolled in the WISE program. Alternatively, as was the case in this study, the results of Trochim's concept mapping are equally valid with a smaller group of volunteer participants.

The typical concept mapping process can be broken down into six steps, shown in Table 2 (Trochim, 1989). The first step, project preparation, involves selecting participants and developing a focus for the data collected through brainstorming and rating. In step 2, participants brainstorm statements and the researcher then edits the raw statements for uniqueness and clarity. In step 3, participants structure the data by sorting the generated ideas into categories, and also rating those ideas along specified dimensions appropriate to the study. At step 4, the researcher applies mathematical analyses to the structured data, resulting in clusters of ideas and averaged ratings. Next, the clusters are defined and labeled, a process which may be completed by the research team and/or may involve the participants. In the final step, the researcher creates visual displays of the data such as cluster and rating maps. Through completion of these six steps, Trochim's concept mapping provides statistically based graphs and charts which illustrate participants' experiences with the phenomenon under study (Caracelli & Riggin, 1994).

Table 2

Steps in Trochim's Concept Mapping Process

Step	Activities
1. Prepare Project	• Select participants • Develop focus for brainstorming and rating
2. Generate Ideas	• Brainstorm statements • Edit statements for clarity and to eliminate duplication
3. Structure Ideas	• Sort statements • Rate statements
4. Concept Mapping Analysis	• Analyze data (multidimensional scaling, hierarchical cluster analysis, and average ratings)
5. Label Concepts	• Define clusters and add labels
6. Create Maps	• Create visual displays as appropriate (point map, point cluster map, cluster map, rating maps)

Although the final concept maps are a result of a well-defined process, Trochim's concept mapping data collection steps are highly flexible. In early studies, Trochim (1989) collected data through focus groups; more recently Trochim's concept mapping has been applied to the analysis of open-ended survey responses (Jackson & Trochim, 2002), email responses (Borner, Glahn, Stoyanov, Kalz & Specht, 2010; Stoyanov & Kirschner, 2004), and individual written responses (Kunkel, Chapa, Patterson & Walling, 1995; Petrucci & Quinlan, 2007). In this study, Trochim's concept mapping's flexibility was utilized to provide multiple ways to participate. Trochim's concept mapping is also flexible in the sorting and rating step; participants can complete sorting and rating activities in focus group settings, in individual interviews, or online. Again, an adaptable approach was preferred for this study to accommodate participants who were geographically dispersed and had busy schedules.

The Trochim's concept mapping approach to data collection and analysis offers several relevant benefits. In Trochim's concept mapping, participants brainstorm responses to a focus prompt, increasing the likelihood that the data reflects participants' unconstrained range of experiences with a phenomenon (Kunkel, Chapa, Patterson & Walling, 1995). Students' motivations to self-select concurrent enrollment were wide-ranging and differed from person to person, so this methodology allowed individuals to offer their own unique suggestions, rather than respond to ideas emanating from the researcher via structured surveys. Grouping and rating of the data was also performed by participants. Thus the final conceptualization was based upon multiple participants' perceptions about the complete set of ideas, rather than an external analyst's interpretation of the data. A traditional approach to analyzing qualitative data would involve the analyst reading through the statements, identifying ideas and coding similar ideas into categories, thus bringing their own interpretation and theoretical orientation to the data set.

In Trochim's concept mapping, each participant offers his or her own interpretation of how the complete set of ideas group together and these interpretations are then mathematically overlaid using statistical techniques to produce one conceptualization for the group. In this way, Trochim's concept mapping results in findings that closely echo the voice of the group and the statistical analyses lend an air of robustness to the data interpretation.

In addition to exploratory studies (Borner, Glahn, Stoyanov, Kalz & Specht, 2010; Brown, 2004; Brown, Sigvaldason & Bednar, 2004; Daughtry & Kunkel, 1993; Kunkel, Chapa, Patterson & Walling, 1995; Ries, Voorhees, Gittelsohn, Roche & Astone, 2008), Trochim's concept mapping has been used in numerous program evaluations (Ridings et al., 2011; Sutherland & Katz, 2005; Trochim, Cook & Setze, 1994; Trochim, Marcus, Masse, Moser & Weld, 2008; Trudeau et al., 2011; Yampolskaya, Nesman, Hernandez & Koch, 2004) and so was ideally suited for this study which was both exploratory and evaluative.

Chapter 3: Method

Participants

All participants in this study were high-achieving secondary students involved in concurrent enrollment through the WISE program. Participants were full-time secondary students registered in sufficient courses to fulfill university admission requirements. Participants' high-achievement was demonstrated through meeting the enrollment criteria for WISE. Participation occurred in two phases: data generation and data sorting/rating. A total of 21 WISE students participated in the first phase. This number exceeds the minimum recommended sample size required to capture a variety of opinions and provide clear results (Kane & Trochim, 2007). In the second phase, a total of 13 WISE students completed the sort/rate activity, sufficient to provide robust results (Kane & Trochim, 2007). Sorters were in Grade 11 (n = 1) and Grade 12 (n = 12). Eleven of the sorters were female, two were male.

Measures

Methods used to collect data in response to the focus prompt, "We'd like to better understand the many reasons high-achieving students have for participating in the WISE program. Think of as many reasons as you can, and please list below" included interviews and written responses. Methods used to facilitate sorting and rating of the generated responses included interviews and online use of proprietary Concept Systems Global (CSG) software. Statements were rated on a five-point scale where 1= not important and 5 = very important.

Concept Mapping Software. CSG is a proprietary web-based application designed exclusively for use with Trochim's concept mapping methodology. A CSG license was purchased for this study from Concept Systems Incorporated (available at www.conceptsystems.com).

Procedure

Ethics Approval and Consent. Ethics approval for this study was obtained from the Faculty of Education Sub-Research Ethics Board on 16th May 2012 (see Appendix A, including revision granted on 23rd August 2012). Prior to participation, all participants received information on the study and were briefed on informed consent (see Appendix B). Participants were given a choice of ways to participate and could take part in the study in-person or online. Those who participated in-person signed consent forms. Online participants were deemed to have consented by their voluntary actions in completing the study activities electronically.

Sampling Procedure. The sample frame consisted of the 95 students enrolled in the 2012-2013 WISE program and all 95 WISE students were invited to participate. 21 students volunteered to participate, comprising 22% of program participants. Recruitment began in October 2012 at which time the program coordinator sent an email to all students enrolled in WISE notifying them about the study and inviting them to participate (see Appendix C). The students were asked to contact me directly via Western e-mail if they wished to participate in the study. This recruitment strategy yielded a low response rate (n = 4). As a next step, I obtained ethics approval to give a brief PowerPoint presentation about the study at a WISE event on 13th October 2012 (see Appendix D). The presentation included a short description of the study purpose and methodology, outlined the two phases of participation, and reviewed informed consent (see Appendix E for complete presentation). In addition, I distributed the letter of information and consent to event attendees who indicated an interest in the study. Students had the opportunity to ask questions about the study and submit their names and email contact information to me directly if they wished to participate.

Statement generation. In phase one data generation, participants brainstormed statements in response to the focus prompt. Participants submitted responses: (a) by email (n=7), (b) in-person during an interview at their school (n=1), or (c) in-person written responses during the WISE event (n=13). Participants who submitted written responses (electronic or in-person) tended to submit either short-form sentences or bullet point responses suitable for sorting/rating. The sole interview respondent was given a copy of the focus prompt prior to the interview and had prepared a list of bullet point responses, which formed the basis of the interview. The interview was audio recorded and individual statements from the recording were extracted per Kane and Trochim (2007).

Statement preparation. Statements were prepared for sorting and rating using the procedures outlined by Kane and Trochim (2007). First the raw statements from phase one were entered into an Excel spreadsheet. Statements were then edited for clarity and compound ideas were split. Next the researcher and research supervisor independently reviewed the statements to derive a list of unique, relevant statements. We examined each raw statement and applied the following data cleaning rules: (a) omit statements that do not respond directly to the focus prompt, and (b) delete repetitions. Data cleaning was completed in Excel, with each statement coded as "u" for unique, "r" for repeated concept or "d" for does not respond to the focus prompt. The two reviewers then cross-referenced the independent coding to compile the final list of statements. This process eliminated irrelevant and redundant statements and also reduced the list of statements to a manageable size.

Statement sorting. In the second participation phase, participants sorted and rated the statements generated in phase one. Participants completed the sorting and rating in one of two ways: during an in-person interview at their school (n = 2) or online (n = 11). The in-person

interviews were scheduled prior to launching the online data collection in order to run-through the instructions before posting them online. In each case, the interview took place in a quiet room at the participants' school. I gave the participant a stack of cards with one statement printed on each card, and asked the participant to sort the statements into piles in a way that "makes sense" to them. Participants were directed to make as many piles as they liked, not to create categories such as "miscellaneous" or "other", and that some statements could be sorted by themselves. Participants appeared to understand the instructions without difficulty and were able to complete the sorting without further instruction. In each case, after the participant had finished sorting, we secured the cards into their piles using paper clips to preserve the sort. Participants then wrote a label that best represented the category on the back of the last card in the pile. Following the interviews, I inputted the data from these in-person manual sorts into the CSG application, using the same host site as the online participants. In this way, I was able to ensure the online data collection tools worked smoothly.

As mentioned, online participation in sorting and rating was facilitated through the CSG application. The CSG software allowed participants in this study to submit their input electronically, at a time and place that was convenient for them. Participants received an email with a user name and password as well as a link to the online application host site that they used to access the concept mapping software. Instructions on how to complete the sorting and rating activities were provided online at the host site and participants were encouraged to email me with any questions or concerns about completing the study activities. For online sorting, participants grouped the statements together by clicking and dragging statements from an on-screen list onto "piles" on the virtual desktop, similar to the actions in a computer game of

solitaire. Participants then gave each pile a label that best represented the category by typing in a label in the appropriate box on-screen.

Statement Rating. As with the sorting activity, participants completed the rating activities either in-person (n = 2) or online (n = 11). Interview participants wrote a numeric rating from 1 to 5 on the front of each statement card. Data from the in-person ratings were manually inputted into the CSG application. Online participants entered a numeric rating for each statement from a drop-down menu via the host site.

Data Analysis and Data Display. Participants generated a total of 127 raw statements in the first phase of data collection. In a sample of 69 concept mapping studies, Rosas and Kane (2012) found studies averaged 96.32 statements (SD = 17.23) with a range of 45 to 132. However, Kane and Trochim (2007) recommend fewer than 100 statements for sorting and rating to minimize participant fatigue. The statement preparation process resulted in a list of 85 unique statements for sorting and rating in the second phase of this study. Following data generation, sorting and rating, CSG software was used to complete the data analyses and produce the data displays. Details of these procedures are provided in chapter 4, study results.

Chapter 4: Results

Data analysis in Trochim's concept mapping involves multidimensional scaling to produce a point map and hierarchical cluster analysis to produce a cluster chart of the sorted data (Trochim, 1989). Together these charts provide a structured visual display of how participants conceptualize the phenomenon under study. The analyses, results, and charts for this study are detailed below.

Multi-Dimensional Scaling: Point Map

The first step in data analysis is to determine the relationship between the statements that were generated in response to the focus prompt. This determination is made by applying two-dimensional non-metric multidimensional scaling to the statement sorts (Trochim, 1989). Multidimensional scaling is a set of data analysis techniques that display the structure of distance-like data as a geometrical picture. In this case, the distance between statements is indicative of how often those statements were sorted together. For each participant, the results of their sort were put into a binary matrix that has as many rows and columns as there are statements, that is an 85 x 85 matrix. All of the values in this matrix were either zero or one, where '1' indicates the statements in that row and column were sorted together and '0' means they were not sorted together. Individual sort matrices were added together to obtain the combined group similarity matrix (see Appendix F). Values in the matrix cells indicate how many participants sorted that pair of statements together.

Multidimensional scaling analyzes the group similarity matrix and assigns each statement a location in space (Kane & Trochim, 2007). Theoretically, multidimensional scaling can assign a location based on multiple dimensions. In practice, two-dimensional scaling is used to create a map of points, i.e. a bivariate distribution suitable for plotting on an x-y graph. Each statement is

assigned a number for reference purposes and these numbers act as labels on the output chart. I used the CGS software to apply multidimensional scaling and derive the set of x-y coordinates for each data statement (see Appendix G for a list of statement reference numbers and coordinates). The resultant mathematical model is plotted as a data point map (see Figure 1). The point map shows each statement as a data point in a spatial relationship with all the other statements according to how participants sorted the statements. Statements that are closely related are positioned near each other, for example, statements 29 "I believe that what I am learning is interesting" and 32 "I'm interested in a particular area of study" are plotted in the same position on the data point map because all 13 sorters in the study grouped them together. Figure 1 shows four statement pairs that were constantly grouped together including: statements 8, "I want to be a lifelong learner" and 49, "I love learning"; statements 6, "I thought I could take on the challenge" and 16, "I wanted a bit of a challenge in my life that included obstacles I needed to overcome"; statements 11, "credit" and 13, "early credit"; as well as statements 29 and 32. Statements that are not closely related, that is, statements that were not grouped together by participants, are graphed further apart.

During multidimensional scaling analysis, the degree of fit between the model and the way participants sorted the data is calculated using Kruskal's stress value. Similar to linear regression, Kruskal's stress analyzes the squared vertical deviations of the individual data points from the model. The stress value varies between 0 and 1, where lower values indicate less stress and better fit. If participants sort statements into similar groups, there will be little stress in the mathematical model (Petrucci & Quinlan, 2007). Conversely, if participants sort statements into dissimilar groups, there will be a poor fit when the data points are plotted causing error or stress. Typically, stress values between 0.205 and 0.365 indicate acceptable goodness of fit in this type

of application (Kane & Trochim, 2007). In this study, Kruskal's stress value was 0.2777, which falls well within the acceptable range.

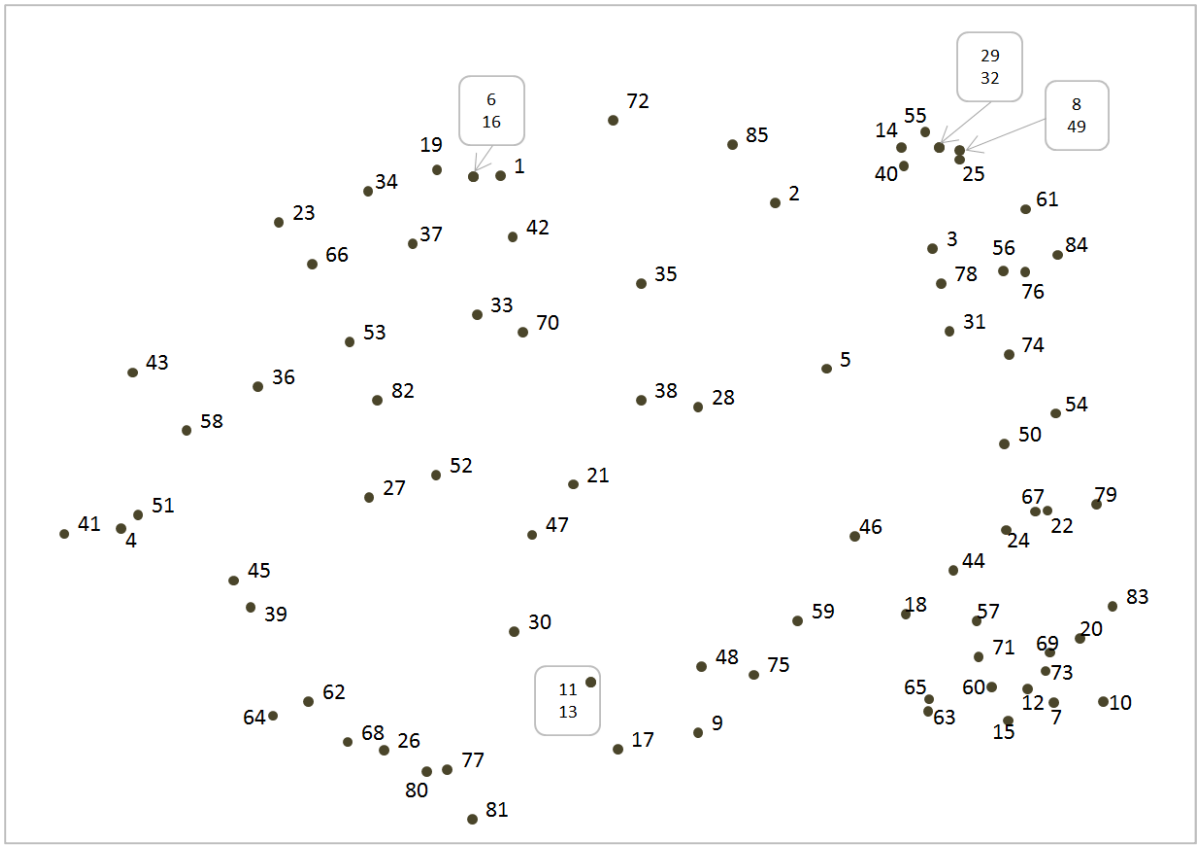

Figure 1. Multidimensional scaling data point map showing spatial relationship between the 85 generated statements. Statements are labeled by number (see Appendix G for a list of statements and their reference numbers).

Note. Distance between statements indicates degree of similarity, similar statements are closer together.

Hierarchical Cluster Analysis: Cluster Map

Following multidimensional scaling, I conducted hierarchical cluster analysis, again utilizing CSG software. In cluster analysis, data points are grouped together according to their proximity on the point map. The x-y coordinates derived from the multidimensional scaling analysis serve as input for the analysis. Trochim's concept mapping uses an agglomerative approach; initially each data point is considered a unique cluster which is then merged with the other data points resulting in successively fewer clusters. The ultimate number of clusters is a qualitative decision made by the researcher based on the continuity of the statements within each cluster (Kane & Trochim, 2007). For example, in deciding between a 15 or 14 cluster model, the researcher examines which two clusters would merge to form the 14-cluster model and decides whether the statements in the merging cluster fit together or are two distinct themes. The resultant model should provide the best possible conceptual fit with the data. In addition to considering conceptual fit in the cluster analysis, the researcher can also examine bridging indices. Bridging indices, which vary between 0 and 1, indicate how often a statement is sorted with other statements on the map (Petrucci & Quinlan, 2007). A bridging index near 1 indicates that a statement bridges different concepts on the map. Conversely, an 'anchor' statement, with a bridging value near 0, is most likely the best indicator of content in that area of the map (Kane & Trochim, 2007). Bridging indices are also calculated for each cluster; cluster bridging indices are the mean of bridging values for all statements within a cluster (Jackson & Trochim, 2002).

In theory, the number of statements in the data set forms the upper limit for the number of clusters. In practice, the researcher begins cluster analysis by setting upper and lower limits on the number of clusters that are practical. According to Rosas and Kane's pooled analysis (2012), the average number of clusters in Trochim's concept mapping studies ranges from 6 to 14 (M =

8.93, SD = 1.55). Therefore, I decided to examine a range of models between 5 and 15 clusters. Beginning with the 15 cluster model, I examined each successive model for conceptual fit, focusing on cluster merges and paying close attention to the conceptual fit between the merging clusters as well as the impact of the merge on the cluster bridging values. Decisions made at each merge were noted in a decision log (see Appendix H). I continued this pattern of analysis until the best fit model with the fewest number of clusters was derived. The resultant cluster map is shown in Figure 2. The cluster map shows how the statements group together into themes and uses polygonal boundaries to delineate the clusters. In this study, the seven cluster configuration yielded a simple model with a good fit to the data. The clusters range in size from 7 to 21 statements with average bridging values between 0.27 and 0.73.

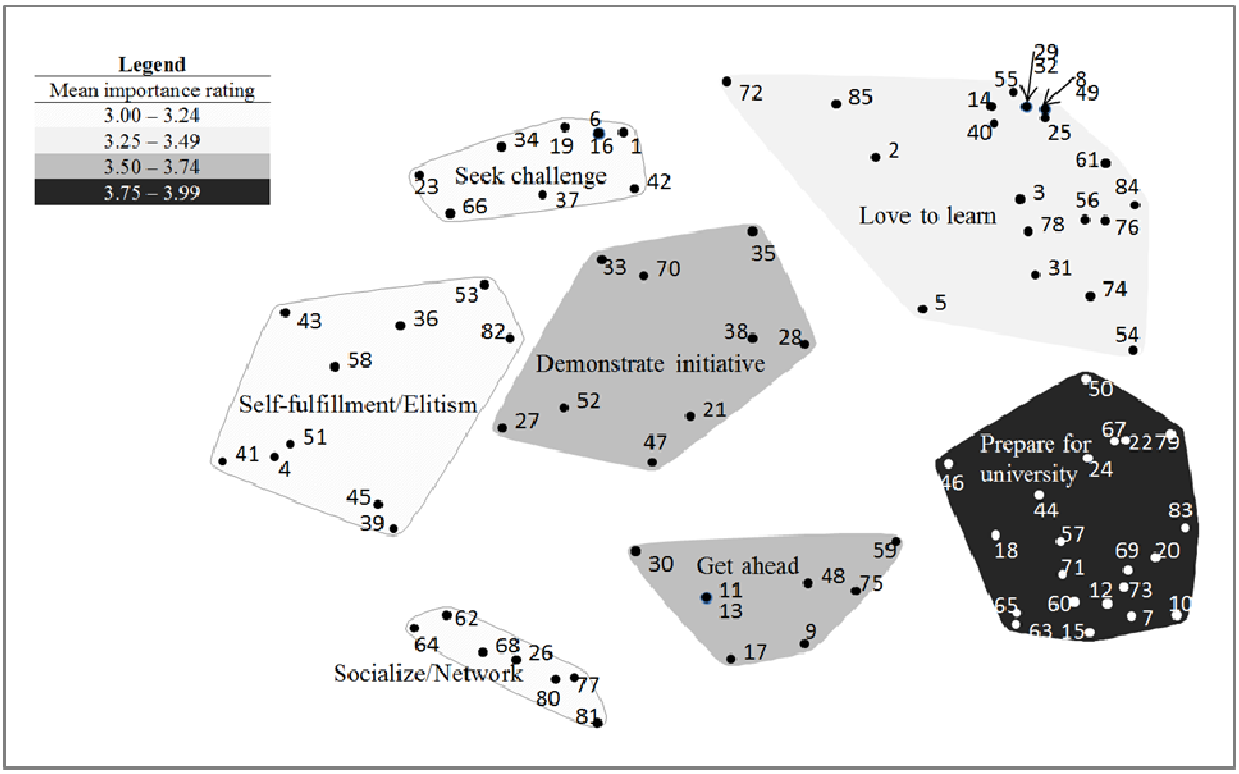

Figure 2. Trochim's concept mapping seven cluster map showing key concepts in volitional engagement in concurrent enrollment.

After the best-fitting cluster map has been chosen, the next step is cluster label analysis. At this stage the analyst examines three sources of information to determine cluster labels: (a) contents of the cluster, (b) labels suggested by participants and (c) analyst's understanding of the map (Kane & Trochim, 2007). To aid in this process, the CSG software has built-in proprietary algorithms that identify the closest fitting labels from the pool of labels given by participants. An examination of the list of cluster labels provides the researcher with additional insight into participants' reflections and structuring of the data. Ideally, the researcher aims to stay true to the participants' voice during the cluster labeling process. To this end, each cluster label in this study was taken directly from terms used by the participants to describe the groupings they made (see Appendix I for list of best-fit labels for each cluster). The seven-cluster model reflects underlying reasons for high-ability students' volitional engagement in concurrent enrollment. The following key concepts are identified in the cluster map: a) prepare for university (*M* bridging index = .27, *SD* = 0.15), b) demonstrate initiative (*M* bridging index = .54, *SD* = 0.04), c) get ahead (*M* bridging index = .44, *SD* = 0.15), d) love to learn (*M* bridging index = .30, SD = 0.22), e) self-fulfillment/elitism (*M* bridging index = .73, *SD* = 0.18), f) seek challenge (*M* bridging index = .56, *SD* = 0.15), and g) network (*M* bridging index = .54, *SD* = 0.04). Table 3 lists the statements grouped in each cluster and statement bridging indices, as well as statement importance ratings which are discussed in the next section.

Table 3

Statements in Each Cluster, Statement Bridging Indices and Importance Ratings

Cluster		Bridging	*M*	*SD*
Prepare for university				
7	A chance to experience university	.26	**4.54**	0.78
65	To get used to the university atmosphere	.15	**4.23**	1.30
57	To be better prepared for university	.17	**4.23**	1.24
18	I wanted to be prepared for next year rather than be thrust into my first year with an overwhelming course load	.24	**4.23**	1.30
20	I wanted to experience a university course	.25	**4.23**	1.24
60	It will make the transition to university easier	.03	**4.15**	1.46
15	Early university experience	.22	**4.15**	1.41
83	To see the workload	.35	**4.15**	1.34
22	I wanted to learn how to manage time in university	.40	**4.15**	1.14
50	It is teaching me stronger work habits	.51	**4.08**	1.32
63	To get a taste of university life	.17	**4.00**	1.41
71	To look at the exams	.12	3.92	1.50
67	To learn how to take notes	.40	3.92	1.38
73	To look at the lesson structure	.06	3.85	1.28
69	To learn what big classes are like	.12	3.77	1.36
79	To see if I'd like to go into the course I took	.57	3.77	1.36
12	I want to experience university life before leaving home	.12	3.69	1.49
44	It helps me see if I want to come to Western	.34	3.54	1.45
10	I want to experience the outside, unprotected life as compared to high school	.25	3.15	1.46
24	I wanted to learn more about Western	.43	3.08	1.44
46	Opportunities to participate in activities	.50	3.08	1.19
Demonstrate initiative				
28	I wanted to take advantage of the opportunity	.52	**4.23**	1.01
21	I am hoping it will help me get scholarships	.52	**4.08**	1.19
38	It demonstrates time management skills	.55	3.77	1.24
27	It looks attractive on university application	.50	3.69	1.38
52	It looks attractive on resume	.52	3.62	1.12
33	I decided to take the initiative	.58	3.62	1.39
47	I like getting ahead in academics	.54	3.54	1.39
35	I don't think I will have much room over the next few years for a course such as this	.65	3.23	1.42
70	No available advancement in high school	.51	3.00	1.29

(Table 3 continues)

(Table 3 continued)

Cluster		Bridging	*M*	*SD*
Get ahead				
59	To be early in preparing for next year	.35	**4.00**	1.29
17	Free tuition	.69	3.92	1.50
30	I was attracted to idea of a head start on credits	.42	3.77	1.24
75	To lower the load next year	.34	3.38	1.50
11	Credit	.35	3.38	1.39
13	Early credit	.35	3.38	1.45
48	It is one less credit I will need in my first year of university	.34	3.23	1.30
9	An opportunity to talk to people and go places	.70	3.08	1.55
Love to learn				
29	I believe that what I am learning is interesting	.01	**4.15**	0.99
49	I love learning	.03	**4.15**	0.99
84	To see what [WISE] can teach me	.36	**4.00**	1.29
2	I love to try new things	.56	**4.00**	1.00
55	The pursuit of knowledge!	.08	3.77	1.17
78	Opportunities to learn independently	.37	3.77	1.54
76	Opportunities to learn	.43	3.77	1.17
14	I want to study [a particular subject] in depth	.08	3.69	1.38
74	Opportunities to explore new subject areas	.59	3.69	1.49
25	I am very interested in [WISE course]	.00	3.46	0.88
8	I want to be a lifelong learner	.03	3.38	1.39
3	[A chance to study a subject] I have wanted to do for a very long time	.31	3.38	1.04
54	It may make high school course easier with new study habits, work ethic etc.	.69	3.38	1.45
56	It seemed like a good opportunity to learn something	.34	3.23	1.48
72	On the whole, university courses are more substantial than high-school courses	.56	3.23	1.30
61	To better expand knowledge	.23	3.15	1.41
32	I'm interested in a particular area of study	.01	3.08	1.26
85	WISE offers courses that my High School does not	.48	3.08	1.75
31	I can apply the subject matter from my WISE course to the studies I am currently enrolled in on a secondary level	.49	3.00	1.35
5	[An opportunity to] master the task of problem solving	.50	2.85	1.41
40	It gave me a chance to learn Spanish	.09	2.15	1.46

(Table 3 continues)

(Table 3 continued)

Cluster		Bridging	*M*	*SD*
Self-Fulfillment/Elitism				
36	It demonstrates motivation to go extra mile	.63	**4.23**	1.09
39	I feel ahead of other people! :)	.63	3.85	1.14
41	I felt honoured to be selected	.80	3.62	1.04
51	Prestige	.49	3.46	1.05
82	To see what doors open	.77	3.23	1.54
53	The course I am taking is a part of one of the programs I am interested in pursuing after graduation	1.00	3.23	1.69
58	It shows you're smart enough to get in (to the program)	.61	2.92	1.19
45	I like be part of special things	.98	2.77	1.54
4	I really love the look on people's faces when they say "You're in grade eleven?!?!"	.50	2.31	1.38
43	I fit the requirements	.90	2.23	1.17
Seek challenge				
6	I thought I could take on the challenge	.38	3.77	1.17
1	I wish to challenge myself by extending my ability to my full potential	.41	3.69	1.03
16	I wanted a bit of a challenge in my life that included obstacles that I needed to overcome	.38	3.46	1.27
34	It became a goal to get in to the program	.55	3.23	1.24
37	I exhausted all other enrichment opportunities at high school	.73	3.15	1.46
19	High school is too easy	.54	2.85	1.46
66	My course load this year isn't very heavy	.64	2.54	1.33
42	It gave me a good reason to be active and to be always on the go	.66	2.54	1.45
23	I am intellectually gifted	.80	2.54	0.97
Network				
64	It's cool to be sitting in a room with others who think like you	.51	3.31	1.25
77	To meet people	.52	3.23	1.42
62	It's always nice to meet other high achievers	.62	3.23	1.36
80	Opportunities to make new friends	.51	3.15	1.34
26	I wanted to network with people that I may be working with in the future, outside of high school walls	.55	3.08	1.26
68	Networking	.50	2.92	1.61
81	To see the students	.58	2.46	1.51

Note: Importance ratings ≥ 4 are in boldface.

Importance Ratings

Participants rated the importance of each statement on a five-point scale, with lower numbers indicating lower importance. A mean rating for each cluster and statement was calculated from the participants' ratings. Table 4 shows means, standard deviations, and ranges for importance ratings for each cluster. In the cluster map, clusters are shaded dark to light according to importance; darker shading denotes higher mean importance rating (see Figure 2). Overall, the mean importance ratings for the clusters range between 3.05 and 3.9, indicating that all clusters were considered important.

Importance ratings for statements ranged from 2.15 to 4.54 (see Table 3). To aid in understanding the results, mean importance ratings for the statements have been grouped into three categories: low ($M \leq 3.00$), moderate ($3.00 < M > 4.00$) and high ($M \geq 4.00$) importance.

Cluster One: Prepare for University. This large cluster contains 21 statements that were sorted together with a high degree of consistency (bridging index = .27). Prepare for University received the highest overall importance rating ($M = 3.9$, $SD = 0.39$), with statement ratings ranging from 3.08 to 4.54. All statements in this cluster are of moderate to high importance; 11 of the statements in this cluster were rated as highly important (see Table 3).

Cluster Two: Demonstrate Initiative. Participants rated Demonstrate Initiative ($M = 3.64$, $SD = 0.36$) as the second most important reason for participating in the WISE accelerated learning opportunity. The cluster contains nine moderate to high importance statements, with importance ratings ranging from 3.00 to 4.23. The bridging index of 0.54 indicates that statements in this cluster were sorted together with a fair degree of consistency.

Cluster Three: Get Ahead. The cluster with the third highest mean importance rating, Get Ahead ($M = 3.52$, $SD = 0.31$), contains eight statements. One statement, "to be early in

preparing for next year", was rated as highly important, while the remaining seven statements in this cluster were rated as moderately important. Statements were consistently sorted together in this cluster, as reflected in the bridging index of 0.44

Cluster Four: Love to Learn. This large cluster reflecting participants' love of learning contains 21 statements that were sorted together with a high degree of consistency (bridging index = 0.30). Statement importance ratings range from 2.15 to 4.15 (M = 3.45, SD = 0.48), including two statements of low importance, 15 of moderate importance, and four of high importance (see Table 3). This cluster contained the lowest rated statement among the entire statement set (statement no. 40).

Cluster Five: Self-fulfillment/Elitism. Statements in the cluster Self-Fulfillment/Elitism were sorted together with the least degree of consistency as reflected in the higher bridging index of 0.73. The 10 statements in this cluster ranged in importance from low to high (M = 3.18, SD = 0.61), with four statements rated as low importance, five rated as moderate importance, and one statement rated as high importance.

Cluster Six: Seek Challenge. Participants' desire for academic challenge was reflected in the cluster, Seek Challenge. This cluster contains nine statements that were sorted together with a fair degree of consistency (bridging index = 0.56). Statements in this grouping ranged from low to moderate importance (M = 3.09, SD = 0.47) with four statements rated low and five statements rated moderate importance.

Cluster Seven: Network. Networking received the lowest overall mean importance rating (M = 3.05, SD = 0.27), revealing that participants recognized networking opportunities as important but not primary reasons to join the program. The seven statements in this cluster were

sorted together with a fair degree of consistency (bridging index = 0.54) and included two statements of low importance and five statements of moderate importance.

Table 4

Clusters and Cluster Importance Ratings

Cluster	Cluster bridging index	Mean importance rating	Std. Dev.	Min	Max
Prepare for university	0.27	3.90	0.39	3.08	4.54
Demonstrate initiative	0.54	3.64	0.36	3.00	4.23
Get ahead	0.44	3.52	0.31	3.08	4.00
Love to learn	0.30	3.45	0.48	2.15	4.15
Self-fulfillment/Elitism	0.73	3.18	0.61	2.23	4.23
Seek challenge	0.56	3.09	0.47	2.54	3.77
Network	0.54	3.05	0.27	2.46	3.31

Summary

The seven-cluster model provided the best conceptual fit to the data and revealed seven key reasons for students to engage in concurrent enrollment (see Figure 2). The right-side of the concept map shows a dense concentration of statements in the clusters Prepare for University and Love to Learn. Together, these two clusters included 42 of the 85 sorted statements, comprising 49% of the set of statements. On the concept map, the cluster Get Ahead is positioned close to Prepare for University, but remains conceptually distinct and was rated as less important. Overall, the more important statements were pulled towards the right of the concept map in the clusters Prepare for University and Love to Learn. The 26 statements grouped towards the left of the concept map in the clusters Seek Challenge, Self-Fulfillment/Elitism, and Network, received lower importance ratings. The cluster labeled Demonstrate Initiative is positioned centrally on the concept map, linking the various reasons to participate in concurrent enrollment revealed through the data analysis.

Chapter 5: Discussion

The primary purpose of this study was to better understand the phenomenon of concurrent enrollment from the students' perspective. Study participants voiced a variety of reasons for engaging in concurrent enrollment which, through the structured conceptualization process, grouped together into seven key concepts. The key concepts are discussed in this chapter, presented in order of importance from most to least important and framed in terms of self-determination theory. Also in this chapter I will compare the conceptualization generated in this study to the benefits of concurrent enrollment identified through the literature review. Finally, I will outline study limitations, describe study implications and suggest areas for future research.

Cluster One: Prepare for University

University preparation emerged as the most important key reason to select concurrent enrollment. This group of high-achieving secondary students recognized preparation as an important step in the transition to university and they welcomed the opportunity to engage in a university level course. Participants wanted to have a "taste of university life," "to get used to the university atmosphere," and "to be better prepared for university." Indeed, a statement in this cluster, "a chance to experience university," received the highest importance rating among all 85 items. University preparedness included the following specific elements: "learn how to take notes," "see the workload," "look at exams," "look at the lesson structure," and "learn how to manage time in university."

Anchoring this cluster is the statement, "it will make the transition to university easier." An anchor statement is one that participants frequently sorted with other nearby statements and therefore serves as a good indicator of content for that part of the map (Kane & Trochim, 2007).

Although there is little prior research on the effect of acceleration on the transition between high school and university (Steenbergen-Hu and Moon, 2011), students in this study believed concurrent enrollment would ease that transition. Participants perceived concurrent enrollment as a way to build competence at the university level before beginning full-time post-secondary studies. A couple of statements in this cluster related directly to Western University: "I wanted to learn more about Western" and "it helps me see if I want to come to Western". High-achieving high school students built on their experiences in this accelerative program to make informed decisions on where to begin their post-secondary education.

Applying self-determination theory to this cluster revealed a mix of intrinsic and extrinsic motivations. Intrinsic motivation, defined as "the doing of an activity for its inherent satisfactions rather than for some separable consequence" (Ryan & Deci, 2000, p.56), varies from person to person. Activities with intrinsic interest appeal to an individual's sense of novelty, challenge or aesthetic value (Ryan & Deci, 2000). In this cluster, the statements "to get a taste of university life" and "a chance to experience university" suggest that participants were drawn to the novelty of a new educational experience.

In contrast, other statements in this cluster pointed to extrinsic motivations to participate. The statement, "it will make the transition to university easier," implied an anticipated outcome of value to the individual. Engagement in an activity because of an anticipated outcome is categorized as extrinsically motivated behaviour (Ryan & Deci, 2000). More specifically, this type of extrinsic motivation reflects a self-determined decision on the part of the participant to engage in concurrent enrollment to reach a valuable goal; easing the transition to university reflects autonomous extrinsic motivation.

Cluster Two: Demonstrate Initiative

Demonstrate Initiative emerged as the second most important concept in choosing concurrent enrollment. The cluster is situated in the centre of the concept map and many of the statements in this cluster are positioned close to other clusters (see Figure 2). Although statements that are difficult to interpret tend to be pulled towards the centre of the map (Jackson & Trochim, 2002), taken together the ideas in this cluster coalesced around the notion of initiative. The statements, "I wanted to take advantage of the opportunity," "I like getting ahead in academics" and "I decided to take the initiative" revealed participants' preferences for taking the initiative.

A couple of statements, "No available advancement in high school" and "I don't think I will have much room over the next few years for a course such as this" fit under the initiative theme as these students planned their own educational paths. These statements indicate that participants actively chose concurrent enrollment as part of an overall education strategy. Through the lens of self-determination theory, these statements suggest autonomous extrinsic motivation as participants engaged in the program because of desirable outcomes related to educational planning.

Other statements in this cluster indicated students sought résumé-building opportunities to demonstrate their academic competence. These statements included the following items which were rated as moderate to high importance: "looks attractive on university application," "looks attractive on résumé," and "hoping it will help me get scholarships." These items indicate that participants consciously valued the end results of engaging in concurrent enrollment, reflecting autonomous extrinsic motivation.

Although participants voiced primarily autonomous extrinsic motivations to take part in concurrent enrollment through this cluster, some statements in this cluster were more difficult to categorize. In particular, the statements, "I decided to take the initiative" and "I wanted to take advantage of the opportunity" were difficult to categorize as either intrinsic or extrinsic; however, both statements reflect self-determined willingness to take action.

Cluster Three: Get Ahead

This cluster was rated as the third most important reason for concurrent enrollment and consisted of statements relating to participants' desire for accelerated learning. Examples of statements in this cluster included the following: "early credit," "I was attracted to the idea of a head start on credits," and "it is one less credit I will need in my first year of university." Although participants rated most statements in this cluster as moderately important, one statement, "to be early in preparing for next year," received a high importance rating. Not surprisingly, this statement was positioned close to the cluster labeled Prepare for University on the concept map (see statement number 59 in Figure 2). In all likelihood, it was included in this cluster because it shares the quality of advancement.

Statements in this cluster revealed a mix of extrinsic and intrinsic motivations to get ahead. On one hand, participation based on the goal "to lower the load next year" suggests autonomous extrinsic motivation as the behavior is goal-driven (Ryan & Deci, 2000). Participants rated this outcome as moderately important. On the other hand, concurrent enrollment viewed as "an opportunity to talk to people and go places" may have been inherently interesting to participants who enjoy new experiences. Interest in novel situations is a classic indication of intrinsic motivation.

One reason for participation grouped in this cluster, "free tuition," falls into the category of externally regulated extrinsic motivation. Externally regulated extrinsic motivation represents behaviours that "are performed to satisfy an external demand or obtain an externally imposed reward contingency" (Ryan & Deci, 2000, p. 61). Free tuition was the only external reward identified by participants in this study. Participants rated free tuition as a moderately important reason to participate in the WISE program. Notably, this aspect of the program may not apply to other concurrent enrollment opportunities. Although free tuition was grouped into this cluster, the high bridging index (bridging index = .69) indicates it was not sorted into this concept with a high degree of consistency. This inconsistency in sorting may have been due to the inherent difference between free tuition and other reasons to participate. Specifically, free tuition stood alone among the generated statements as the only item reflecting participation for reward; other extrinsic motivations were contingent upon outcomes.

Cluster Four: Love to Learn

Through statements in this cluster, Love to Learn, participants in this study voiced a passion for learning. Despite being one of the largest clusters in the concept map, this cluster had one of the lowest bridging indices. The low bridging index indicates that participants perceived the many items in this cluster as a cohesive concept and the large number of statements suggests that participants had many ways of voicing their love of learning. The statements, "I want to be a lifelong learner" and "I love learning" were consistently sorted together and anchor this concept. These anchor statements provide a strong expression of content in this part of the map. Another consistently sorted pair of statements was grouped in this cluster: "I believe that what I am learning is interesting" and "I'm interested in a particular area of study." These statements reflected participants' desire to focus learning on specific academic topics. In the cluster labeling

process, CSG software identified the label “knowledge junkies” as the best fit for this grouping and it may be an apt description of these students who subscribed to “the pursuit of knowledge.”

Statements in this cluster ranged from high to low importance and included the lowest rated statement in the data set, “it gave me a chance to learn Spanish,” although the low rating may be tied to the specified subject. Interestingly, all statements containing the WISE program name were grouped into this cluster, an indication that the program offered participants an opportunity to pursue their passion for learning. For example, the statements, “to see what [WISE] can teach me” and “I am very interested in [WISE course],” reflected students’ intrinsic motivations to explore individual areas of interest. Taken as a whole, statements in this cluster implied intrinsic motivations to engage in concurrent enrollment based on an inherent love of learning.

Cluster Five: Self-fulfillment/Elitism

Statements in this cluster, Self-Fulfillment/Elitism, had moderate to high bridging indices, meaning these statements connected to other concepts in the map and were sorted into different groups by different participants. In fact, this cluster had the highest average bridging index among the set of seven concepts, signalling that the items located in this cluster were more loosely associated than those in the other six concepts. As a consequence, this cluster was the most difficult to label. Cluster labels suggested by CSG software included the following: internal motivation, honest egomaniacs, I'm smart!, individuality, to satisfy the desire to feel "elite," and self-fulfillment. Upon reviewing the statements in the cluster, I chose the label Self-Fulfillment/Elitism as the best fit because the all items fit into the concept of fulfillment but some have a flavour of elitism. Alongside expressions of fulfillment, participants voiced elitist

feelings of "specialness" and "prestige" which flowed from participation in this unique program tailored to high-achieving students.

Most statements in this cluster were rated as moderately important, including the following items: "I felt honoured to be selected," "I like to be part of special things," and "it shows you're smart enough to get in [to the program]". A statement sorted into this cluster, "it demonstrates motivation to go the extra mile," received one of the highest importance ratings overall and it was the only statement rated high importance in this cluster. Conceptually, this item may have fitted into the cluster labelled Demonstrate Initiative; however, it was positioned in this area of the map through the multi-dimensional scaling analysis (see statement number 36 in Figure 2) together with other statements connected to the notion of above average performance. Other statements in this cluster included the following: "I feel ahead of other people! ☺," "to see what doors open," and "I fit the requirements."

The reasons to participate expressed through this cluster represented a mix of extrinsic and intrinsic motivations. The notions of prestige and honour are linked to external reward dependant on approval from self or others. Therefore, these reasons to participate in concurrent enrollment are classified as extrinsic in a self-determination theory framework (Ryan & Deci, 2000). On the other hand, motivation to go the extra mile implies intrinsic motivation. Other statements in this cluster were more difficult to categorize. For example, the statement, "I fit the requirements" appears at face value to be a statement of fact, rather than a motivation.

Although the statements in this cluster were loosely connected, it is noteworthy that Self-Fulfillment/Elitism emerged as a key concept. As described in the literature review, theory of work adjustment proposes two necessary requirements for educational adjustment: fulfillment and competence (Lubinski & Benbow, 2000). Statements in this cluster suggest that high-

achieving students in this study chose concurrent enrollment because they expected it to be a fulfilling experience. Other statements in the data set, particularly those clustered under the concept Demonstrate Initiative, indicated that participants perceived concurrent enrollment as a way to demonstrate their academic competence and achievements. Taken together, the clusters Self-Fulfillment/Elitism and Demonstrate Initiative suggest that participants strive for educational adjustment through concurrent enrollment.

Cluster Six: Seek Challenge

Another key reason for choosing accelerated learning through concurrent enrollment was to fulfill the desire for academic challenge. More than half of the sorters assigned a cluster name including the word "challenge", signifying that the theme of challenge was well-recognized among study participants. Statements in this cluster included: "I thought I could take on the challenge" and "it became a goal to get in to the program." A couple of statements, "I exhausted all other enrichment opportunities at high school" and "I am intellectually gifted," were not as frequently sorted into this grouping but still fit well conceptually. Items in this cluster were rated as moderate or low importance and the average importance rating for the cluster was only slightly higher than the lowest rated cluster. Collectively, statements in this cluster reflected intrinsic motivations based on the inherent challenge of accelerated learning (Ryan & Deci, 2000).

The concept of seeking challenge is consistent with the notion that concurrent enrollment moderates boredom in high school (Wolf & Geiger, 1986). The idea of insufficient challenge leading to boredom is embodied in the statement, "high school is too easy." The high-achieving participants in this study had demonstrated academic competence through their high school grades; through statements in this cluster they expressed a desire to challenge their competencies.

The notion of seeking challenge to find fulfillment was represented in this cluster through the statement, "I wish to challenge myself by extending my ability to my full potential." This statement reiterates the notion of finding the balance between competence and fulfillment through concurrent enrollment.

Cluster Seven: Network

The final cluster in the concept map is labeled Network. In this cluster, study participants identified social opportunities afforded through the program as a key reason for choosing concurrent enrollment. Although this cluster received the lowest average importance rating, most statements in the cluster were rated as moderate importance, with two items rated as low importance. The opportunity to network with others emerged as a discrete, cohesive concept. The fact that nine sorters assigned cluster labels including the words "network" or "meet people" was another indicator of the cohesiveness of this concept. "Networking" and "it's always nice to meet other high achievers" are examples of statements in this cluster.

In general, the statements in this cluster reflected intrinsic motivation to participate stemming from inherent interest in meeting others who had similar interests. Through a self-determination theory lens, networking meets the condition of relatedness required for self-determined motivation (Ryan & Deci, 2000). Relatedness is defined as "the desire to feel a reciprocal connection to others" (Garn, Matthews & Jolly, 2010, p. 264). One statement in this cluster, "it's cool to be sitting in a room with others who think like you" succinctly conveys the notion of relatedness in a social environment.

The findings from this cluster give an interesting insight into how participants perceived the social impact of this accelerative option. As described in the literature review, research has shown that educators' reluctance to accelerate students is often founded on fears of negative

social impact (Colangelo et al., 2004b). Results from this study suggest that networking with like-minded peers is a positive reason for students to participate in programmed acceleration, especially for students concurrently enrolled at high school and university levels. Indeed, participants viewed concurrent enrollment as an "opportunity to make new friends."

Summary of Motivations Revealed through Cluster Analysis

The findings from this study reveal rich and textured motivations for high-ability students to participate in concurrent enrollment. At a high-level of analysis, the key concepts Love to Learn, Seek Challenge and Network reflected more strongly intrinsic motivations, whereas the clusters Prepare for University, Get Ahead and Self-fulfillment/Elitism reflected a mix of intrinsic and autonomous extrinsic motivations. The cluster Demonstrate Initiative reflected primarily autonomous extrinsic motivations. At a finer level of analysis, many individual statements were difficult to interpret in terms of motivation. In part the interpretation was hampered by the short phrasing of responses to the focus question which did not allow a deep exploration of type of motivation. In addition, strict categorization was not always possible because motivation exists along a continuum (Ryan & Deci, 2000).

On the surface, it may appear unsurprising that a study of students who chose concurrent enrollment revealed primarily self-determined motivations to participate. However, participation for external reward, in the form of free tuition, was cited as a reason to participate, albeit rated as only moderately important. It is also worth noting the absence of external influence from others. Participants did not mention recommendations or encouragement from peers, parents or teachers. As mentioned in the literature review, the decision to accelerate is ideally made jointly by the student, parent and educator. Findings from this study suggest that parents and educators did not exert significant external influence on students' decisions to participate. This is not to say that

they did not support and guide students in their decision-making. It is also possible that some parents and/or educators may have influenced eligible high-achieving students against taking part in the program and such non-participants would not be captured in this study sample.

Comparison of Study Findings to Benefits of Concurrent Enrollment Identified through the Literature Review

A comparison of study findings against the list of benefits identified through the literature review is useful to determine the degree of importance that students placed on each. To briefly recap, advantages of concurrent enrollment include the following five anticipated benefits to students: exposure to university life (Wolf & Geiger, 1986), exposure to more challenging curriculum content (Rogers, 2002; Wolf & Geiger, 1986), opportunity to engage in a wider range of academic courses (Dodge, 2012; Karnes & Chauvin, 1982; Wolf & Geiger, 1986), opportunity to pursue specific academic areas of interest (Rogers, 2002), and shorter length of time in post-secondary education (McConnaha, 1997). In this section, I will consider each of the five benefits identified through the literature review to the reasons given by study participants for choosing concurrent enrollment.

Exposure to university life. Through a questionnaire administered to 212 students, parents and counselors involved in concurrent enrollment programs, Wolf and Geiger (1986) found that exposure to university life was one of the greatest strengths of concurrent enrollment. Similarly, participants in this study rated the cluster Prepare for University, as the most important key reason for concurrent enrollment. This cluster included the elements "a chance to experience university," "to get used to the university atmosphere," and "to get a taste of university life," which were all rated as highly important. In short, participants viewed the opportunity to become familiar with university life and its demands as a highly beneficial aspect of the program.

Exposure to more challenging curriculum content. In writing about matching educational programming to individual learners' needs, Rogers (2002) suggested that exposure to more challenging, advanced curriculum content is one benefit of concurrent enrollment for high-ability learners. The findings of this study indicated that participants do view concurrent enrollment an as opportunity to engage in academic challenge. The cluster Seek Challenge emerged as a key concept and included statements that were rated moderate to low importance. One statement from the cluster Love to Learn expressed the idea of exposure to challenging academic content in the student's own words, "on the whole, university courses are more substantial than high school courses." Other reasons related to challenging curriculum content included the notion that enrichment opportunities at high school had been "exhausted" and more generally that "high school is too easy."

Opportunity to engage in a wider range of academic courses. Another suggested benefit of concurrent enrollment is that students can access a broader variety of courses than available through local high schools (Dodge, 2012; Karnes & Chauvin, 1982; Wolf & Geiger, 1986). Participants in this study agreed that access to a wider range of courses was a reason to engage in concurrent enrollment. Through statements grouped in the cluster Love to Learn, participants voiced a desire to "expand knowledge" and "try new things." One of the statements in the cluster labeled Love to Learn explicitly reflected this benefit as follows: "WISE offers courses that my High School does not." This statement was rated as a moderately important reason for participating in the WISE program.

Opportunity to pursue specific academic areas of interest. The literature review revealed that concurrent enrollment may benefit high-ability students by providing an opportunity to pursue specific academic areas of interest (Rogers, 2002). Indeed, participants in

this study did cite this benefit as a reason for concurrent enrollment. A statement in the cluster Love to Learn illustrated this concept: "[A chance to study a subject] I have wanted to do for a very long time." Other statements in the same cluster also related to the concept of pursuing specific areas of interest including: "I want to study [a particular subject] in depth," "I'm very interested in [WISE course]," and "I'm interest in a particular area of study." Each of these statements received moderate importance ratings, indicating that the opportunity to pursue specific academic areas was an important reason for participants to engage in concurrent enrollment.

Shorter length of time spent in post-secondary education. McConnaha (1997) suggested that students benefit from concurrent enrollment because it results in a shorter length of time spent in post-secondary education. In this study, the specific notion of less time in university did not emerge as a reason to participate in concurrent enrollment, although participants did mention getting ahead in a general sense. Although not specified as a reason to participate, getting ahead in credit accumulation may indeed lead to a shorter length of time in university and the cluster Get Ahead emerged as the third most important key concept overall.

Educational Implications

The findings from this study have educational implications that are of interest to teachers, schools, school boards and universities. Teachers play a critical role in the identification of high-ability learners and are responsible for delivery of special education services within an inclusive education classroom environment (Edmunds & Edmunds, 2008). In this role, teachers need to be aware of options for programming and placement for high-ability learners. Results from this study can help inform educators about students' views on acceleration in general and concurrent enrollment in particular. The key concepts show that accelerants in this study enjoyed academic

challenge, liked to get ahead, sought opportunities that were fulfilling, and appreciated networking with like-minded peers. It is useful for teachers to be aware of these factors as they support high-achieving students in attaining the best educational outcomes possible. In addition, participants in this study were keen to prepare for university; secondary school teachers can support senior students in this transition by being aware of concurrent enrollment opportunities and its benefits.

At the secondary school level, educators can use the results of this study to help identify potential candidates for concurrent enrollment. Study findings indicate that high-achieving students who wish to prepare for university are ideal candidates. Within their counselling role, school guidance counsellors are ideally situated to identify potential candidates. Additionally, through concurrent enrollment offerings schools can support students' interest in a broader range of academic topics than available within high school. Information about concurrent enrollment opportunities could be offered alongside information on high school courses.

At the board level, school boards may consider developing policies and protocols for identification of potential candidates for concurrent enrollment. Clear guidelines should ensure opportunities are presented equitably to potential candidates across all schools and include strategies to promote a pro-active approach to increasing awareness about concurrent enrollment opportunities. For example, students entering grade 9 could benefit from learning about concurrent enrollment as part of their high school orientation. Findings from this study show that challenge-seeking students strove to enter concurrent enrollment as they perceived it to be a rewarding experience; participants were motivated to "get into the program." This accelerative option could be a motivator to high-ability students as early as grade 9.

Results from this study also have implications for universities. This study demonstrated that the WISE program was a first-point of contact for high-achieving secondary students who are planning their post-secondary pathways. Program participants used the concurrent enrollment opportunity to gather information towards university selection. In 2007, the WISE program coordinator completed an environmental scan of concurrent enrollment opportunities across Ontario and found no programs similar to WISE at that time. Given the positive interest in concurrent enrollment evidenced through this study, other universities may consider establishing similar concurrent enrollment programs as a means to promote their institutions to high-achievers among the incoming class.

WISE Program Implications

As discussed in chapter one, results from this study form a baseline evaluation of WISE participants' expectations which can be used to inform program planning. The study findings showed that WISE participants anticipated many program benefits. A thorough understanding of these anticipated benefits can contribute to the development of specified program outcomes. Program outcomes are the effects of the program or changes that occur due to program activities (Vogt, 2007). Anticipated benefits have been discussed in detail above; therefore in this section I will identify only key anticipated effects of program participation that could be used to define WISE program outcomes and provide a brief description of each.

From the participants' perspective, the most important long-term benefit revealed through the structured conceptualization was "to be better prepared for university." They wanted to experience university level workload, lessons, class sizes and exams, and to learn how to effectively manage time to meet those demands. The program provided a beneficial link between

school and post-secondary educational environments. As one participant put it, “I want to experience the outside, unprotected life as compared to high school.”

Participants perceived getting a head start on university credits as another long-term program benefit. Credit earned through the program can be applied towards a degree at Western or transferred to another post-secondary institution. Early credit can benefit participants in one of two ways: it may reduce the course load in the first year of university or it may allow participants to get ahead in credit accumulation.

An intermediate term benefit was to learn more about Western University. As mentioned, concurrent enrollment can help build relationships between high-ability secondary students and universities. Through the WISE program, participants learned about university in general and Western in particular. Participants viewed the WISE program as a way to learn more about Western in the context of choosing post-secondary pathways.

Increased educational challenge was an anticipated short term benefit. Taking a university course through the WISE program augmented high school curriculum as reflected in the statement, “my course load this year isn’t very heavy.” Furthermore, WISE students can engage in a wider range of courses through Western than available through high school: “WISE offers courses that my High School does not.” In addition to a wider range of courses, WISE provided opportunities to explore subject areas in greater depth. The opportunity to study in-depth was a benefit to participants who were “very interested in [WISE course].”

A key anticipated benefit with short and long-term effects was the opportunity to network through program participation. Although this benefit was rated as the least important cluster, meeting new people and making friends was a distinct concept and an important reason to participate. Building relationships and making friends may be important program outcomes.

To summarize, the findings from this study show how program participants conceptualized the concurrent enrollment opportunity provided through the WISE program. The key concepts and individual statements generated through this study provide a baseline evaluation of participant needs and highlight benefits that relate to program outcomes. Potential program outcomes include the following: prepare for university, earn a university credit, learn about Western, increase academic challenge, study a course of interest in depth, and forge new relationships. These suggested outcomes in the context of all the data gathered through this study may be useful in the development of a program logic model, including outcomes and indicators, to guide future program planning.

Limitations

It is important to note that some limitations apply to the interpretation of these study results. Some of these limitations affect the external validity of this study. External validity is the degree to which the findings of a study can be applied externally to populations beyond the study sample (Gay, Mills & Airasian, 2012). This study involved a relatively small group of high-ability participants in a unique concurrent enrollment program. The study did not include high-achieving students who had the opportunity to participate in the WISE program but chose not to do so. In addition, the study sample comprised mostly female participants. Due to these limitations, the study findings may not be generalizable. However, a strength of Trochim's concept mapping is that it aims to "achieve a broad sampling of ideas rather than a representative sampling of persons" (Kane & Trochim, 2007, p. 36).

Another limitation to the applicability of the study results to a larger population is that this study did not include high-ability, low-achieving students. A study involving high-ability students who are not high-achieving may yield different results.

It is also useful to examine threats to the internal validity of this study. Internal validity is the degree to which conclusions drawn from the study results are justified (Gay, Mills & Airasian, 2012). One such threat to the internal validity of this study is the potential for selection bias because the study was not based on a random sample of participants. Selection bias is a threat when the people who volunteer to participate are different is some systematic way from those who did not volunteer. For example, those who choose to volunteer might be more altruistic or more achievement oriented than those who did not.

It is worth noting that not all of the participants involved in the statement generation phase were involved in the sorting phase. While participant mortality may be considered a threat to longitudinal study designs, it presents less of a problem in Trochim's concept mapping. In studies using this methodology it is not uncommon for the number of sorters to be fewer than the number of participants involved in data generation, and this smaller sample of sorters may be part of the study design (Kane & Trochim, 2007; Rosas & Kane, 2012).

Participant fatigue during the sorting and rating phase may have presented a threat to the quality of the data. In each of the interviews the sorting/rating took approximately 50 minutes to complete, although no signs of fatigue were noted. The CGS software does not track the amount of time online participants took to complete the sorting and rating tasks; however, the software did provide the option for online participants to save their work and return to the task if they were unable to complete the sorting and rating tasks in one sitting.

Future Research

This study begins to address a gap in the field of research on acceleration, specifically on students' perspectives on concurrent enrollment. However, there remain a number of areas for future research. Students who experience accelerative options may experience university-level

course work prior to attending university full-time, as in concurrent enrollment or may enter college early through accelerated completion of grade school (Colangelo et al., 2004b). Little is known about the experiences of accelerants as they transition to university (Steenbergen-Hu and Moon, 2011). In one study I did find, Muratori, Colangelo and Assouline (2003) interviewed ten early college entrants and found generally positive adjustment. However, I am unaware of any studies examining transition to university for students who have experienced concurrent enrollment. The paucity of research on this type of acceleration suggests that much could be learned from future research examining WISE students' adjustment to university. For example, a longitudinal study tracking university outcomes for students who engaged in concurrent enrollment would provide a clear picture of the long-term implications of this type of acceleration.

Another avenue for future research would be to explore the perceptions of students who chose not to opt into the WISE program. Many high-achieving students meet the eligibility criteria but do not enroll in the program. Their reasons for choosing not to enroll may reveal a different perspective. Such research would illuminate the differences between those students who do and those who do not benefit from concurrent enrollment opportunities.

Yet another area for future research is to examine attitudes and opinions towards concurrent enrollment among high-ability learners who have not demonstrated high-achievement. One limitation of this study is that it does not include this group of under-achieving students. Future research is needed to understand whether the opportunity to participate in concurrent enrollment would be motivating to this group of learners.

Conclusion

This study presents a structured conceptualization of how high-achieving students perceive engagement in concurrent enrollment. The findings suggest that participants willingly engage in concurrent enrollment due to intrinsic and autonomous extrinsic motivations. Participants actively seek a balance between competence and fulfillment to maintain positive educational adjustment. These students view concurrent enrollment as an opportunity to prepare for university while fulfilling a love of learning and a desire to demonstrate initiative. Getting ahead, seeking challenge and self-fulfillment are also important aspects of concurrent enrollment. Given the highly positive comments voiced by students in this study, other universities may give consideration to introducing similar concurrent enrollment programs to meet the educational needs of high-achieving secondary students.

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Appendix A: Ethics Approval

Western Education

WESTERN UNIVERSITY
FACULTY OF EDUCATION
USE OF HUMAN SUBJECTS - ETHICS APPROVAL NOTICE

Review Number:	1205-1
Principal Investigator:	Elizabeth Nowicki
Student Name:	Lynn Dare
Title:	*Western Initiative for Scholarly Excellence (WISE) Program Evaluation*
Expiry Date:	March 31, 2013
Type:	M.Ed. Thesis
Ethics Approval Date:	May 16, 2012
Revision #:	
Documents Reviewed & Approved:	Western Protocol, Letters of Information & Consent, Email Recruitment Message

This is to notify you that the Faculty of Education Sub-Research Ethics Board (REB), which operates under the authority of the Western University Research Ethics Board for Non-Medical Research Involving Human Subjects, according to the Tri-Council Policy Statement and the applicable laws and regulations of Ontario has granted approval to the above named research study on the date noted above. The approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the REB's periodic requests for surveillance and monitoring information.

During the course of the research, no deviations from, or changes to, the study or information/consent documents may be initiated without prior written approval from the REB, except for minor administrative aspects. Participants must receive a copy of the signed information/consent documentation. Investigators must promptly report to the Chair of the Faculty Sub-REB any adverse or unexpected experiences or events that are both serious and unexpected, and any new information which may adversely affect the safety of the subjects or the conduct of the study. In the event that any changes require a change in the information/consent documentation and/or recruitment advertisement, newly revised documents must be submitted to the Sub-REB for approval.

Dr. Alan Edmunds (Chair)

2011-2012 Faculty of Education Sub-Research Ethics Board

Dr. Alan Edmunds	**Faculty of Education (Chair)**
Dr. John Barnett	**Faculty of Education**
Dr. Farahnaz Faez	**Faculty of Education**
Dr. Wayne Martino	**Faculty of Education**
Dr. George Gadanidis	**Faculty of Education**
Dr. Elizabeth Nowicki	**Faculty of Education**
Dr. Immaculate Namukasa	**Faculty of Education**
Dr. Kari Veblen	**Faculty of Music**
Dr. Ruth Wright	**Faculty of Music**
Dr. Kevin Watson	**Faculty of Music**
Dr. Jason Brown	**Faculty of Education, Associate Dean, Research** ***(ex officio)***
Dr. Susan Rodger	**Faculty of Education, Western Non-Medical Research Ethics Board** ***(ex officio)***

The Faculty of Education
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Research Officer
Faculty of Education Building

Western Education

WESTERN UNIVERSITY
FACULTY OF EDUCATION
USE OF HUMAN SUBJECTS - ETHICS APPROVAL NOTICE

Review Number:	1205-1
Principal Investigator:	Elizabeth Nowicki
Student Name:	Lynn Dare
Title:	*Western Initiative for Scholarly Excellence (WISE) Program Evaluation*
Expiry Date:	March 31, 2013
Type:	M.Ed. Thesis
Ethics Approval Date:	August 23, 2012.
Revision #:	1
Documents Reviewed & Approved:	Revised Study Method, Revised Recruitment, Revised Inclusion Criteria, Revised Number of Study Participants, Revised Letter of Information & Consent.

This is to notify you that the Faculty of Education Sub-Research Ethics Board (REB), which operates under the authority of the Western University Research Ethics Board for Non-Medical Research Involving Human Subjects, according to the Tri-Council Policy Statement and the applicable laws and regulations of Ontario has granted approval to the above named research study on the date noted above. The approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the REB's periodic requests for surveillance and monitoring information.

During the course of the research, no deviations from, or changes to, the study or information/consent documents may be initiated without prior written approval from the REB, except for minor administrative aspects. Participants must receive a copy of the signed information/consent documentation. Investigators must promptly report to the Chair of the Faculty Sub-REB any adverse or unexpected experiences or events that are both serious and unexpected, and any new information which may adversely affect the safety of the subjects or the conduct of the study. In the event that any changes require a change in the information/consent documentation and/or recruitment advertisement, newly revised documents must be submitted to the Sub-REB for approval.

Dr. Alan Edmunds (Chair)

2012-2013 Faculty of Education Sub-Research Ethics Board

Dr. Alan Edmunds	**Faculty of Education (Chair)**
Dr. John Barnett	**Faculty of Education**
Dr. Farahnaz Faez	**Faculty of Education**
Dr. Wayne Martino	**Faculty of Education**
Dr. George Gadanidis	**Faculty of Education**
Dr. Elizabeth Nowicki	**Faculty of Education**
Dr. Julie Byrd Clark	**Faculty of Education**
Dr. Kari Veblen	**Faculty of Music**
Dr. Jason Brown	**Faculty of Education**
Dr. Susan Rodger	**Faculty of Education**
	Faculty of Education, Associate Dean, Research ***(ex officio)***
Dr. Shelley Taylor	**Faculty of Education, Western Non-Medical Research Ethics Board** ***(ex officio)***
Dr. Ruth Wright	**Faculty of Music, Western Non-Medical Research Ethics Board** ***(ex officio)***
Dr. Kevin Watson	**Faculty of Music, Western Non-Medical Research Ethics Board** ***(ex officio)***

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Appendix B: Letter of Information/Consent

WISE Program Evaluation: Letter of Information/Consent Form

(Email to Respondents)

Lynn Dare, Master's of Education student, Faculty of Education
Dr. Elizabeth Nowicki, Faculty of Education

Thank you for offering to participate in this research study. The study occurs in two phases. In the first phase, you may choose to respond to a research question via email or in a face-to-face interview. The research question asks about your reasons for taking part in WISE.

In the second phase you will be asked to complete a sorting/rating task. You will be asked to sort responses from all study participants into categories, and also to rate responses in terms of importance. This task can be completed in a face to face interview to be held either at your school or at Western campus, whichever is mutually convenient, or can be completed and submitted via email. The task should take approximately 30-40 minutes, and will be completed between October and December 2012.

Purpose of the Study: The aims of this study are (a) to explore participants' experiences with the program and (b) to understand participants' reasons for taking part in WISE.

Voluntary Participation: Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no effect on your grades or academic status. If you choose to participate via email please note that responding to the questions and submitting them to the researcher via email indicates your consent to participate in the study.

Confidentiality: The information collected will be used for research purposes only, and neither your name nor information which could identify you will be used in any publication or presentation of the study results. All information collected for the study will be kept confidential. Audio recordings of the interview will be destroyed six weeks after project completion. In the final report, data will be reported in aggregate form only. However, quotations from your interview or email responses might appear in conference papers or published articles about the study.

Risks: There are no known risks to participating in this study.

Questions: If you have any questions about the conduct of this study or your rights as a research participant you may contact the Office of Research Ethics, Western University at 519-661-3036 or [email]. If you have any questions about this study, please contact Lynn Dare, at [email] or the

faculty advisor Dr. Elizabeth Nowicki at [email]
Note: You may request an electronic copy of any paper written about the study.

Consent: If you consent to participate in this study, please respond to this email indicating your preferences. Specifically, you may choose:

a) **to complete both phases via email,**
b) **to complete both phases in person,**
c) **to complete the first phase via email and the second phase in person or**
d) **to complete the first phase in person and the second phase via email.**

Thanks again for agreeing to participate!

Kind regards,

Lynn Dare

Appendix C: Message from the WISE Program Coordinator

As a WISE student, you are invited to take part in a study being completed by Lynn Dare, a Master's of Education student at the Faculty of Education at Western University. The overall aim of this study is to understand participants' reasons for taking part in WISE. If you agree to participate, you will be asked to take part in two interviews to be held either at your school, or at Western campus, whichever is mutually convenient. During the first interview, you will be asked about your reasons for taking part in WISE. The interview will last approximately 20-30 minutes. During the second interview, you will be asked to sort responses from all study participants into categories, and also to rate responses in terms of importance. The second interview will last approximately 30-40 minutes. The interviews will be held between September and December 2012.

If you would like to participate in this study, please contact the student researcher directly at the email address below, indicating you would like to take part.

If you have any questions about this study, please contact:

Student Researcher: Lynn Dare
Faculty Supervisor: Dr. Elizabeth Nowicki

Appendix D: Ethics Approval Revision - September 26, 2011

Western Education

WESTERN UNIVERSITY
FACULTY OF EDUCATION
USE OF HUMAN SUBJECTS - ETHICS APPROVAL NOTICE

Review Number:	1205-1
Principal Investigator:	Elizabeth Nowicki
Student Name:	Lynn Dare
Title:	*Western Initiative for Scholarly Excellence (WISE) Program Evaluation*
Expiry Date:	March 31, 2013
Type:	M.Ed. Thesis
Ethics Approval Date:	September 26, 2012.
Revision #:	2
Documents Reviewed & Approved:	Revised Recruitment, Revised Study Method, Letter of Information and Consent for Email Participation

This is to notify you that the Faculty of Education Sub-Research Ethics Board (REB), which operates under the authority of the Western University Research Ethics Board for Non-Medical Research Involving Human Subjects, according to the Tri-Council Policy Statement and the applicable laws and regulations of Ontario has granted approval to the above named research study on the date noted above. The approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the REB's periodic requests for surveillance and monitoring information.

During the course of the research, no deviations from, or changes to, the study or information/consent documents may be initiated without prior written approval from the REB, except for minor administrative aspects. Participants must receive a copy of the signed information/consent documentation. Investigators must promptly report to the Chair of the Faculty Sub-REB any adverse or unexpected experiences or events that are both serious and unexpected, and any new information which may adversely affect the safety of the subjects or the conduct of the study. In the event that any changes require a change in the information/consent documentation and/or recruitment advertisement, newly revised documents must be submitted to the Sub-REB for approval.

for Dr. Alan Edmunds (Chair)

2012-2013 Faculty of Education Sub-Research Ethics Board

Dr. Alan Edmunds	**Faculty of Education (Chair)**
Dr. John Barnett	**Faculty of Education**
Dr. Farahnaz Faez	**Faculty of Education**
Dr. Wayne Martino	**Faculty of Education**
Dr. George Gadanidis	**Faculty of Education**
Dr. Elizabeth Nowicki	**Faculty of Education**
Dr. Julie Byrd Clark	**Faculty of Education**
Dr. Kari Veblen	**Faculty of Music**
Dr. Jason Brown	**Faculty of Education**
Dr. Susan Rodger	**Faculty of Education**
	Faculty of Education, Associate Dean, Research ***(ex officio)***
Dr. Shelley Taylor	**Faculty of Education, Western Non-Medical Research Ethics Board** ***(ex officio)***
Dr. Ruth Wright	**Faculty of Music, Western Non-Medical Research Ethics Board** ***(ex officio)***
Dr. Kevin Watson	**Faculty of Music, Western Non-Medical Research Ethics Board** ***(ex officio)***

The Faculty of Education
1137 Western Rd.
London, ON N6G 1G7

Research Officer
Faculty of Education Building

Appendix E: WISE Event Study Presentation

WISE

Why are we here?

Who I am...

- Lynn Dare
- Master's of Education Graduate Student
- Completing a Master's thesis
  - Examining acceleration as a programming option for high-achieving students

What is the study?

- Examines the many reasons students have for participating in WISE
- Data is analyzed using multi-dimensional scaling and hierarchical cluster analysis to for graphical representation of responses

What participants do in the study...

Study occurs in two phases:

- In phase 1 - you may choose to respond to the research question via email or in a face-to-face interview.
  Timeframe: before October 30
  Time commitment: 10- 20 minutes
- In phase 2 - you will be asked to take part in a sort task to be held either at your school or at Western campus, or via email.
- During the task you will be asked to sort responses from all study participants into categories, and also to rate responses in terms of importance.
  Timeframe: November-December
  Time commitment: 30-40 minutes

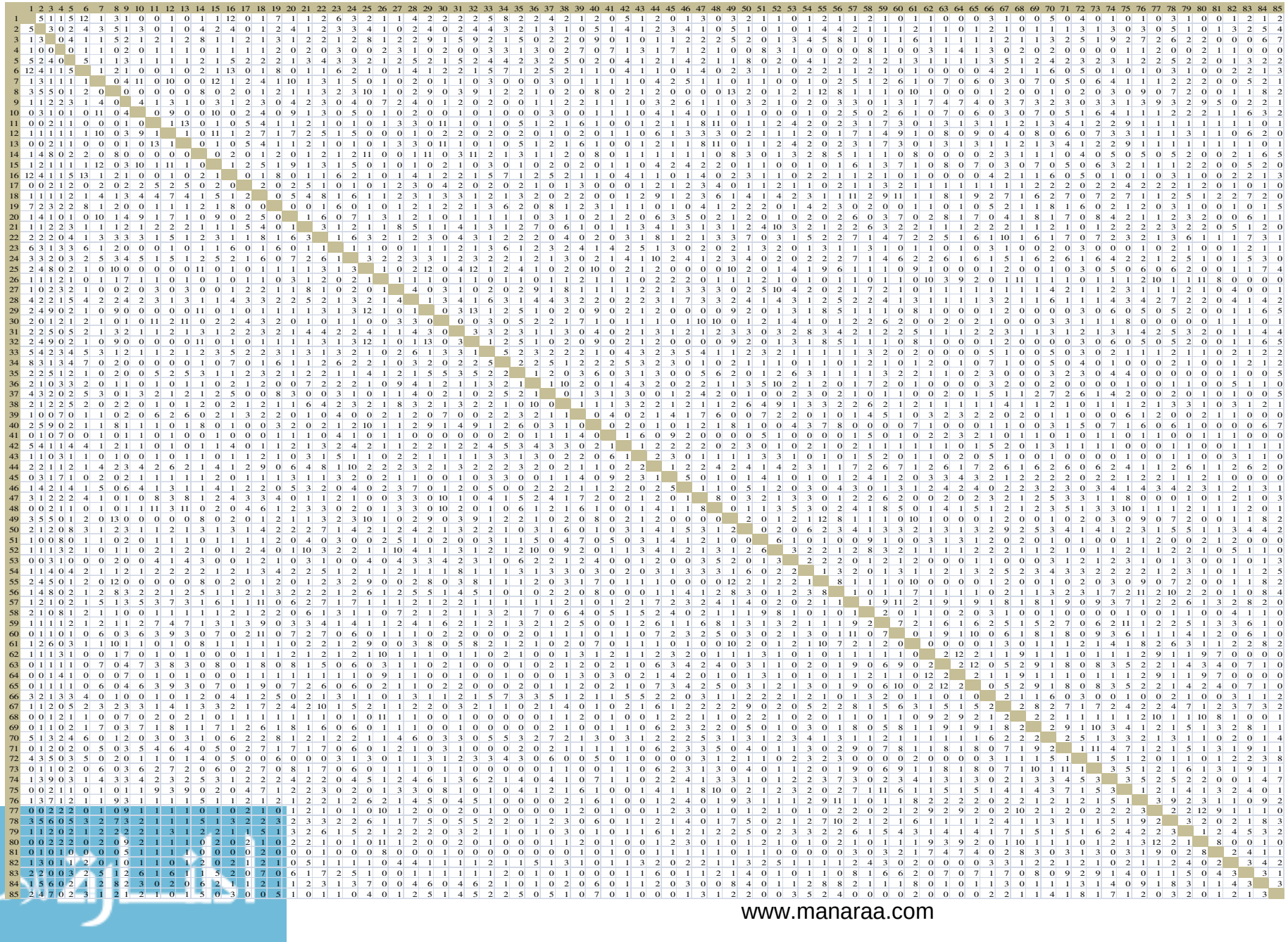
Questions?

- Participation is completely voluntary
  - Has no effect on grades or academic status in WISE/Western
- Information is confidential
  - Your name will not be used in any presentation of study results
- Questions
  - Faculty advisor Dr. Elizabeth Nowicki at
  - Lynn Dare, at

How to participate...

Email me at

Appendix F: Group Similarity Matrix



Appendix G: Statement Reference Numbers and Point Coordinates for Data Point Map

#	Statement	X	Y
1	I wish to challenge myself by extending my ability to my full potential	-0.649	-1.319
2	I love to try new things	0.254	-1.191
3	[A chance to study a subject] I have wanted to do for a very long time	0.772	-0.973
4	I really love the look on people's faces when they say "You're in grade eleven?!?!"	-1.893	0.351
5	[An opportunity to] master the task of problem solving	0.423	-0.409
6	I thought I could take on the challenge	-0.736	-1.313
7	A chance to experience university	1.17	1.172
8	I want to be a lifelong learner	0.86	-1.439
9	An opportunity to talk to people and go places	-0.001	1.311
10	I want to experience the outside, unprotected life as compared to high school	1.331	1.167
11	Credit	-0.351	1.074
12	I want to experience university life before leaving home	1.082	1.106
13	Early credit	-0.351	1.074
14	I want to study [a particular subject] in depth	0.667	-1.45
15	Early university experience	1.02	1.254
16	I wanted a bit of a challenge in my life that included obstacles that I needed to overcome	-0.736	-1.313
17	Free tuition	-0.263	1.391
18	I wanted to be prepared for next year rather than be thrust into my first year with an overwhelming course load	0.681	0.752
19	High school is too easy	-0.855	-1.343
20	I wanted to experience a university course	1.253	0.869
21	I am hoping it will help me get scholarships	-0.409	0.141
22	I wanted to learn how to manage time in university	1.147	0.266
23	I am intellectually gifted	-1.376	-1.097
24	I wanted to learn more about Western	1.014	0.36
25	I am very interested in [WISE course]	0.861	-1.391
26	I wanted to network with people that I may be working with in the future, outside of high school walls	-1.03	1.395
27	It looks attractive on university application	-1.08	0.206
28	I wanted to take advantage of the opportunity	0	-0.229
29	I believe that what I am learning is interesting	0.792	-1.452
30	I was attracted to idea of a head start on credits	-0.602	0.837
31	I can apply the subject matter from my WISE course to the studies I am currently enrolled in on a secondary level	0.825	-0.584
32	I'm interested in a particular area of study	0.792	-1.452
33	I decided to take the initiative	-0.724	-0.664
34	It became a goal to get in to the program	-1.083	-1.244
35	I don't think I will have much room over the next few years for a course such as this	-0.186	-0.807

#	Statement	X	Y
36	It demonstrates motivation to go extra mile	-1.445	-0.323
37	I exhausted all other enrichment opportunities at high school	-0.936	-0.997
38	It demonstrates time management skills	-0.185	-0.259
39	I feel ahead of other people! :)	-1.469	0.722
40	It gave me a chance to learn Spanish	0.676	-1.36
41	I felt honoured to be selected	-2.081	0.374
42	It gave me a good reason to be active and to be always on the go	-0.608	-1.03
43	I fit the requirements	-1.857	-0.391
44	It helps me see if I want to come to Western	0.838	0.548
45	I like be part of special things	-1.523	0.596
46	Opportunities to participate in activities	0.513	0.388
47	I like getting ahead in academics	-0.543	0.381
48	It is one less credit I will need in my first year of university	0.011	0.999
49	I love learning	0.86	-1.439
50	It is teaching me stronger work habits	1.006	-0.048
51	Prestige	-1.837	0.289
52	It looks attractive on resume	-0.859	0.097
53	The course I am taking is a part of one of the programs I am interested in pursuing after graduation	-1.144	-0.533
54	It may make high school course easier with new study habits, work ethic etc.	1.176	-0.196
55	The pursuit of knowledge!	0.748	-1.527
56	It seemed like a good opportunity to learn something	1.004	-0.871
57	To be better prepared for university	0.914	0.785
58	It shows you're smart enough to get in (to the program)	-1.678	-0.114
59	To be early in preparing for next year	0.327	0.786
60	It will make the transition to university easier	0.964	1.097
61	To better expand knowledge	1.077	-1.161
62	It's always nice to meet other high achievers	-1.277	1.167
63	To get a taste of university life	0.757	1.211
64	It's cool to be sitting in a room with others who think like you	-1.396	1.234
65	To get used to the university atmosphere	0.758	1.153
66	My course load this year isn't very heavy	-1.267	-0.9
67	To learn how to take notes	1.106	0.269
68	Networking	-1.15	1.356
69	To learn what big classes are like	1.155	0.933
70	No available advancement in high school	-0.576	-0.58
71	To look at the exams	0.922	0.956
72	On the whole, university courses are more substantial than high-school courses	-0.278	-1.577
73	To look at the lesson structure	1.142	1.023
74	Opportunities to explore new subject areas	1.022	-0.475
75	To lower the load next year	0.184	1.038

#	Statement	X	Y
76	Opportunities to learn	1.073	-0.867
77	To meet people	-0.823	1.489
78	Opportunities to learn independently	0.799	-0.806
79	To see if I'd like to go into the course I took	1.309	0.234
80	Opportunities to make new friends	-0.89	1.498
81	To see the students	-0.74	1.723
82	To see what doors open	-1.052	-0.256
83	To see the workload	1.36	0.717
84	To see what [WISE] can teach me	1.182	-0.943
85	WISE offers courses that my High School does not	0.113	-1.465

Appendix H: Cluster Merge Decision Log

Model	Clusters (Bridging Values)		Clusters Merged	Decision	Comments
15 cluster	1. Challenge myself	0.47			
	2. Challenge	0.68			
	3. Resume building	0.52			
	4. Take initiative	0.56			
	5. Prestige	0.68			
	6. Honest Egomaniacs?	0.78			
	7. Personal Growth	0.53			
	8. Love of Learning	0.04			
	9. Learning Opportunities	0.40			
	10. Experience University	0.17			
	11. Prepare for university	0.31			
	12. Learn university skills	0.50			
	13. Get ahead	0.50			
	14. Prepare early	0.34			
	15. Socialize/Network	0.54			
14 cluster	1. Challenge myself	0.47	13) Get Ahead and 14) Prepare Early	✓ Accept merge	Good conceptual fit
	2. Challenge	0.68			
	3. Resume building	0.52			
	4. Take initiative	0.56			
	5. Prestige	0.68			
	6. Honest Egomaniacs?	0.78			
	7. Personal Growth	0.53			
	8. Love of Learning	0.04			
	9. Learning opportunities	0.40			
	10. Experience university	0.17			
	11. Prepare for university	0.31			
	12. Learn university skills	0.50			
	13. Get ahead	0.44			
	14. Socialize/Network	0.54			
13 cluster	1. Seek challenge	0.56	1) Challenge myself and 2) Challenge	✓ Accept merge	Good conceptual fit
	2. Resume building	0.52			
	3. Take initiative	0.56			
	4. Prestige	0.68			
	5. Honest Egomaniacs?	0.78			
	6. Personal Growth	0.53			
	7. Love of Learning	0.04			
	8. Learning opportunities	0.40			
	9. Experience university	0.17			
	10. Prepare for university	0.31			
	11. Learn university skills	0.50			
	12. Get ahead	0.44			

	13. Socialize/Network 0.54			
Model	**Clusters** (Bridging Values)	**Clusters Merged**	**Decision**	**Comments**
12 cluster	1. Seek challenge 0.56 2. Resume building 0.52 3. Take Initiative 0.56 4. Prestige 0.68 5. Honest Egomaniacs? 0.78 6. Personal Growth 0.53 7. Love of Learning 0.04 8. Learning Opportunities 0.40 9. Experience University 0.17 10. Prepare for University 0.42 11. Get Ahead 0.44 12. Socialize/Network 0.54	10) prepare for university and 11) learn university skills	✓ Accept merge	Good conceptual fit
11 cluster	1. Seek challenge 0.56 2. Demonstrate Initiative 0.54 3. Prestige 0.68 4. Honest Egomaniacs 0.78 5. Personal Growth 0.53 6. Love of Learning 0.04 7. Learning Opportunities 0.40 8. Experience University 0.17 9. Prepare for University 0.42 10. Get ahead 0.44 11. Socialize/Network 0.54	2) resume building and 3) take initiative	✓ Accept merge	reasonable conceptual fit, no diverse effect on bridging statistics, results in simpler conceptual map
10 cluster	1. Seek challenge 0.56 2. Demonstrate initiative 0.54 3. Prestige 0.68 4. Honest Egomaniacs? 0.78 5. Personal growth and learning 0.18 6. Learning Opportunities 0.40 7. Experience University 0.17 8. Prepare for University 0.42 9. Get ahead 0.44 10. Socialize/Network 0.54	5) personal growth and 6) love of learning	✓ Accept merge	combines small cluster (3 statements) with tight cluster (bridging value 0.04), good conceptual fit

Appendix I: Participants' Best fit Cluster Labels

Chosen Cluster Label	10 best-fit labels identified by CSG software
Prepare for university	Experience
	University preparation
	Easier transition to university
	Experience university course
	Gain University Experience
	To learn what life at university is like
	To Learn Specific University Skills
	Prepare for university
	Way to Check Out Western
	To learn about Western
Love to Learn	Knowledge Junkies
	Learning
	Love to Learn
	Studying in an area of interest
	The love to learn
	Study of different subjects
	Opportunity to further one's knowledge
	Love for learning
	learning opportunity
	Pure Interest in Learning
Self-fulfillment/Elitism	internal motivation
	Honest Egomaniacs
	I'm smart!
	Individuality
	To satisfy the desire to feel "elite"
	Self-fulfillment
	Something for the Resume
	Wanting to be accepted into a program like WISE
	Attractive/Impressive Achievement
	Image Portrayed to Others

(Table continues)

(Table continued)

Chosen Cluster Label	10 best-fit labels identified by CSG software
Seek Challenge	Wanting to challenge oneself
	Challenge Themselves
	High school easy, not enriching
	To satisfy the need for more enrichment
	Challenge myself
	To challenge oneself
	Being active
	Reason To Go Out and Do Something
	To keep busy
	Have the time to be more busy!
Demonstrate initiative/success	To experience performing at a higher level
	Typical Overachievers
	Future Opportunities
	Future Studies
	University Entrance
	Personal Success
	New, interesting opportunity
	Curiosity to attempt new things
	Wants to Take Advantage of the Opportunity
	Accelerate Learning
Get ahead	Bonuses
	Extra Credit!
	extra credit for university
	To get ahead
	Getting ahead in credits
	Bargain Hunter
	Free class
	Money
	Free!
	money
Network	Socializing
	Networking
	Networking
	Wants to Meet New People
	Networking and Meeting People
	Networking
	Getting to know more people who are intelligent
	To Meet New People
	Social reactions and aspects
	To Meet Like-Minded People

Curriculum Vitae

Name:	Lynn Dare
Post-secondary Education and Degrees:	University of Carleton Ottawa, Ontario, Canada 1999-2004 B.A. Georgian College Barrie, Ontario, Canada 2007-2008 O.C.G.C.
Honours and Awards:	Joseph-Armand Bombardier Canada Graduate Scholarship - Social Sciences and Humanities Research Council 2012-2013 Ontario Graduate Scholarship 2012-2013, (declined) Centre for Inclusive Education Research Award – University of Western Ontario 2013 Graduate Thesis Research Award – University of Western Ontario 2012-2013 Western Graduate Research Scholarship – University of Western Ontario 2011 Millward Brown Leadership Award - Georgian College 2008 Georgian Scholar Honour List - Georgian College 2008 Senate Medal for Outstanding Academic Performance - Carleton University 2004 Dean's Honour List - Carleton University 2001, 2002, 2003 Hyman Soloway Scholarship - Carleton University 2003 Claude Bissell Scholarship - Carleton University 2003 University Part-time Scholarship - Carleton University 2001
Related Work Experience	Research Associate Christine Frank & Associates 2008-2013