

# Assessing Core Competencies in British Columbia

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## Assessing Core Competencies in British Columbia

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### **Abstract**

The purpose of this study was to assess whether the use of student self-assessment of non-cognitive skills is accurate and reliable by comparing them to the assessment of student development provided by their teachers of these same skills. For this study non-cognitive skills refer to skills including communication, collaboration, creative thinking, critical thinking, and social emotional skills. Non-cognitive skills are recognized as important for individuals and for communities. There is increased pressure on schools to develop non-cognitive skills in their students. To do this, useful assessments must be used to guide individuals as well as decision makers and policy makers. Assessing non-cognitive skills is particularly challenging. British Columbia recently redesigned its entire K-12 curriculum and placed non-cognitive skills as the foundation of the new curriculum. The plan to measure the development of these skills is to use student self-assessments. Are such assessments useful? This study uses students in grades six through nine from a small British Columbia middle school as the sample and compares self-assessment of non-cognitive skills to the assessments that homeroom teachers provide of the same students to help ascertain the utility of the assessments. This study found that though the relationship between assessments is positive, it is weak. Teacher assessments are most strongly predicted by student fundamental skill development than any other variable. Serious questions are raised about the validity of either assessment which points to the need for clarity of purpose when selecting and using assessment tools, especially for non-cognitive skills.

*Keywords:* Non-cognitive skills, Core Competencies, student self-assessment, student self-reporting, standardized profiles, British Columbia

### **Acknowledgements**

The journey of being a doctoral student has been a richly rewarding one and where it will take me has yet to be determined and cannot be predicted. A year ago, I use to believe things could be predicted: overnight that changed. Seemingly within days the world got locked down as the global pandemic of the novel coronavirus swept across our planet. Priorities changed and the importance of developing non-cognitive skills in ourselves and our youth was amplified. We were just over a year into our doctoral program and our cohort of 17 learners from British Columbia were leaders on the frontlines of education. Our cohort was an experiment from the beginning, but none of us could have anticipated the uncharted territory we would explore together. Through this program, with the caring and brilliant support of our professors, we stretched, grew, learned, and challenged ourselves and each other. Strength, flexibility, belief, and desire to learn, drove our cohort and our professors to make our program as meaningful and powerful as possible. Throughout, I was challenged and there were times in each course that I had serious doubts about my ability to do what I had committed to.

This dissertation is the culmination of the work all of us invested in this program and my personal commitment to the transformation of British Columbia's curriculum. I entered education with a firm belief in the value of public education, and with an equally firm belief that we can do better. I have always been driven by a relentless restlessness and in this program I found kindred spirits who were equally committed to doing something about it.

None of this would have been possible without the love, patience, belief, sacrifices, and support of my wife, Stacey. Our sons, Jacob and Riley, are reminders of the importance of our work, and my pride for them energizes me daily. Finally, I owe a lifetime of gratitude to my parents Roy and Elizabeth for the life they gifted me and the passions they instilled in me.

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## **Chapter One: Introduction**

### **Introduction**

British Columbia began implementing its redesigned curriculum in the fall of 2015 (“British Columbia Ministry of Education Redesigned Curriculum Introduction,” n.d.) and the Core Competencies are at the heart of the changes as they “underpin the curricular competencies in all areas of learning” (“British Columbia Ministry of Education Redesigned Curriculum Overview,” n.d.). These Core Competencies are Communication, Collaboration, Critical Thinking, Creative Thinking, Personal Awareness and Responsibility, Positive Personal and Cultural Identity, and Social Awareness and Responsibility (“BC’s New Curriculum Core Competencies,” n.d.). The skills, attitudes, and attributes that define these “Competencies” are often referred to as non-cognitive skills (Duckworth & Yeager, 2015; Kautz et al., 2014). To assess student development of these Core Competencies, the Ministry of Education has developed descriptive profiles that students are to use for self-assessment. The purpose of this study is to assess whether these assessments are accurate and reliable by comparing them with similar assessments by the students’ teachers.

This chapter outlines the purpose of this study and the background from which it is formed. The next section defines the problem more specifically, looking at the structure and sources for British Columbia’s redesigned curriculum. The last section provides a brief overview of the methods used in this study to find answers to key questions.

### **Purpose of this Study**

I am a teacher and principal in British Columbia, Canada, who has been involved in a variety of very minor capacities throughout the design and implementation of our province’s redesigned curriculum over the past decade. Currently, I do not know if the measurements of

non-cognitive skills that we are using provincially are useful, yet, like many others, I make decisions and policy based on those measurements. I believe that my school is reflective of most schools in British Columbia: we have embraced the redesigned curriculum but are struggling to find measures we understand about how our students are doing in their reframed learning journeys. In the traditional academic areas, we have found methods of reporting that we understand so they are prioritized in our planning; however, the Core Competencies, which are the cornerstone of our redesigned curriculum, are to be student self-reported. There is skepticism about the validity of student self-reporting. At the school level, I have no way of knowing how my students are doing in any of the seven identified competencies, so I have little to base my policies and resource allocation decisions on, despite the importance of these skills.

Consequently, most of my decisions default to the known academic areas because we have more confidence in those measures.

This study explores the accuracy and utility of student self-reporting of Core Competencies by comparing student self-reports using provided profiles with the assessments provided by their teachers. The goal is to provide educational leaders with guidance about whether we can trust student self-assessments of non-cognitive skills to guide our practice and decision making. It also examines ways student self-assessments can be valuable and useful.

British Columbia introduced an entirely redesigned curriculum five years ago and there are few ways of measuring whether the redesign is improving student development in non-cognitive skills. The only measurement collected at the Ministry level is the number and percentage of students who proceed to post-secondary education within one and three years after high-school graduation (“Enhancing Student Learning Reporting Order”, 2020). This study provides information about the usefulness of the self-assessment program designed for these



skills. Finally, this study provides a template for others to follow when seeking efficient and meaningful measures to help understand the development of non-cognitive skills in youth.

### **Methods and Research Questions**

The central question of this study is, “How useful are student self-assessments, using prescribed profiles, of Core Competencies in British Columbia?” This study collected self-assessments from students in four grades in one British Columbia middle school of their development of these skills and will compare their assessments with those of their homeroom teachers. In addition to the central question of this study, four other questions were examined:

1. Is there a relationship between student self-assessments, using prescribed profiles, of Core Competencies in British Columbia, and the assessments given by their teachers when measuring student development of the seven identified Core Competencies?
2. Is this relationship robust to gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, student attendance, student tardiness, or student behaviour?
3. How do gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with student self-assessment of their development in each of the seven Core Competencies?
4. How do student gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with teacher assessments of student development in each of the seven Core Competencies?

Though a small study, 324 students from one school, this study is the first designed to measure the reliability of British Columbia’s Ministry of Education’s plan to assess the development of non-cognitive skills in youth and provides an early indication of how accurate the process is.

## **Background**

The importance of non-cognitive skills has increasingly been recognized internationally in response to the dynamic challenges facing economies, communities, and education (Fadel, Bialik, & Trilling, 2017; Lundberg, 2019; OECD, 2018; Wagner, 2008). Consequently, public schools are charged with developing these skills in their students. Such expectations carry numerous challenges.

The term “non-cognitive skills” itself raises several challenges. First, it is a misnomer as many of the skills associated with the term, require significant cognition (Duckworth & Yeager, 2015). In addition to this challenge is the breadth of what is considered when one refers to “non-cognitive skills”. When using this term, some think of intrapersonal skills such as grit, self-regulation, creative thinking, and curiosity (Di Fabio, 2014; Duckworth, 2014; Duckworth & Yeager, 2015; Dweck, 2016; Fadel, Bialik, & Trilling, 2015; Kenny, et al., 2016; Seligman, 2011). Others think of interpersonal skills such as collaboration, empathy, emotional intelligence, and community responsibility (Deming, 2017; Durlak, Weissberg, Taylor, & Schellinger, 2011; Frydenberg, Liang, & Muller, 2017). In practice, these and many other attributes are referenced by the almost ubiquitous term.

Another challenge that prioritizing these skills presents is in finding their place in the already crowded school curriculum (Zhao, 2012). With an emphasis on content coverage, battles for curricular primacy are constant, so adding more or different priorities is a significant challenge. To do this, they must supersede those already present and change in education is particularly challenging (Fullan, 2007; Hargreaves, 2005).

Finally, to teach and prioritize non-cognitive skills one should know how to assess them, and this compounds the challenges already mentioned and is compounded by them. Numeracy,

reading, writing, and other curricular competencies have many accepted measurements that are used to inform policies and decisions. Because of this, education systems and programs tend to be analyzed based on these measures. Due to the increased focus on non-cognitive skills, there is an increasing number of assessments available for use; however, there is little agreement about how to use such assessments let alone the value of individual assessments (Denham, 2015; Duckworth & Yeager, 2015; Egalite, Mills & Greene, 2014). This is compounded by the breadth of what are considered important non-cognitive skills for measurement.

### ***British Columbia's Curriculum Transformation***

Early in the 21<sup>st</sup> century, British Columbia undertook a significant redesign of its K-12 school curriculum. The redesign followed an earlier failed attempt. In 1987 the provincial government of the time launched a comprehensive Royal Commission on education led by lawyer Barry Sullivan. The report was tabled in 1988 and in 1989 then Minister of Education, Tony Brummet, “promised the rapid implementation of almost all of the Sullivan recommendations” (Hawthorne, 1990, p. 143). However, what became known as the “Year 2000” plan failed for a number of reasons, not least of which it was not “appropriately supported and was not generally viewed favourably by educators” (Sanford & Hopper, 2020, p. 8). Toward the end of the first decade of the new century, the Ministry of Education began the ambitious task of redesigning the curriculum for British Columbia’s schools. The concepts, ideas, and intentions of the earlier attempt informed the content of the redesigned curriculum, but more importantly, the failure of the earlier attempt informed the process and approach of the most recent endeavor.

The redesign, more accurately described as a transformation (R. Allen, personal communication, October 28, 2020), was wide ranging and involved stakeholders throughout the

province. The first challenge was to build social license for the changes. This was done by bringing internationally renowned scholars and practitioners to speak at key events at key times in British Columbia. It was also done by holding many open dialogue sessions with leaders throughout British Columbia and by engaging in transparent co-creation of the new curriculum.

Two of the most significant elements of the redesigned curriculum are the design and the foundation. The curriculum design follows a “know-do-understand” framework (Gacoin, 2021) and is best explained in a paper about their work in British Columbia authored by Walt, Toutant, and Allen for the Organisation for Economic Cooperation and Development (OECD) (Walt, Toutant, & Allen, 2017) and in Erickson and Lanning’s work (2014) on concept-based curriculum. The second key element has Core Competencies as the foundation of the curriculum. The Core Competencies are the most comprehensive list of non-cognitive skills of any educational jurisdiction in the world (Taylor, Fadel, Kim, & Care, 2020). Recognizing the importance of non-cognitive skills to student and social success, British Columbia has placed the development of these skills as the foundation of its new curriculum.

### **Assessment Plan.**

As mentioned above, one of the challenges for teaching non-cognitive skills is how to assess them (Duckworth & Yeager, 2015; Elliott, Frey, & Davies, 2015; Haggerty, Elgin, & Woolley, 2011). The plan in British Columbia is for students to self-assess their development in these areas over the course of their K-12 journey (British Columbia’s Ministry of Education, n.d.b). Self-assessment is a valuable tool for improving self-regulated learning and self-efficacy (Pandero, Jonsson & Botella, 2017); however, it poses many challenges for summative assessment (Brown, Andrade, & Chen, 2015; Brown & Harris, 2013; Gehbach & Hough, 2018). As the foundation of the redesigned curriculum, it is obvious that non-cognitive skills are valued

and important to the Government of British Columbia (“Vision for Student Success”, n.d.c.). Consequently, one could assume that measuring the success of this work will be important. A recent publication by the Ministry of Education (BC Ministry of Education, 2020), the Learning Reporting Order, indicates that one of the five recognized educational outcomes of British Columbia’s education system is that “[S]tudents will have the core competencies to achieve their career and life goals”; however, the only measure of this outcome is the “[N]umber and percentage of students transitioning to Canadian post-secondary institutions within 1 and 3 years”. Where does student self-assessment of Core Competencies fit in this accountability measure? Is this a good measure of student non-cognitive skill development, participation in post-secondary institutions? It is this vacuum that this study helps to inform.

#### **British Columbia’s Core Competencies.**

British Columbia is a province in the country of Canada. Canada is recognized by the OECD as one of the five best education systems in the world (“OECD Education”, n.d.; Schleicher, 2018; Tucker, 2011). Within Canada, each province is responsible for its own education system. British Columbia, Alberta, and Ontario are perennial top-performers based on the assessment of cognitive skills – literacy, numeracy, and science (“Conference Board of Canada”, n.d.; “OECD Canada”, n.d.).

Within the past decade, British Columbia redesigned the curriculum that guides the learning of its youth. This was a bold undertaking considering the international position and respect it had garnered; however, the various partner groups, led by educators and the Ministry of Education, decided to review the curriculum and adjust it to better prepare youth for the new demands of the increasingly dynamic world they were going to participate in (“British Columbia’s Provincial Curriculum and Assessment Development Process,” n.d.).

This redesign was not a response to measures of poor performance; rather, it was motivated by experience and the breadth of research demonstrating the need to prepare students differently (“British Columbia’s Provincial Curriculum and Assessment Development Process”, n.d.). This redesign started in the early 21<sup>st</sup> century and involved “reviews of trends in national and international jurisdictions” and guidance from “invited authorities on curriculum and assessment design” brought in “to advise on proposed changes” (“British Columbia’s Redesigned Curriculum”, n.d.). It should be noted that efforts to redesign British Columbia’s education system started with a Royal Commission in 1987 lead by Barry Sullivan (Hawthorne, D., 1990). However, the reform efforts largely failed in the first decade of the new century. The current redesign of British Columbia’s curriculum has many elements from the recommendations in Sullivan’s report.

### *The Educated Citizen.*

The first draft of the new competencies was introduced in August of 2015. In the current redesign, British Columbia has made non-cognitive skills the focus of its curriculum, rather than the “un-written” parts that educators have always worked on without coherence, alignment, and recognition (“British Columbia’s Redesigned Curriculum Overview”, n.d.). The Mission Statement of the British Columbia Ministry of Education clearly links the three foci of education enumerated by Labaree (1997): “The purpose of the British Columbia school system is to enable learners to develop their individual potential and to acquire the knowledge, skills, and attitudes needed to contribute to a healthy society and a prosperous and sustainable economy” (“British Columbia’s Redesigned Curriculum Overview”, n.d.). It further develops its plan by outlining what an “Educated Citizen” is and many of the descriptors reference non-cognitive skills such as developing the “human potential,” the ability to “adapt to change,” accepting “the tolerant and

multifaceted nature of Canadian society” and being “motivated to participate actively in our democratic institutions” (“British Columbia’s Redesigned Curriculum Overview”, n.d.). They provide more specific descriptors of what its schools will help with the development of; citizens who are:

- thoughtful, able to learn and to think critically, and who can communicate information from a broad knowledge base;
- creative, flexible, self-motivated and who have a positive self-image;
- capable of making independent decisions;
- skilled and who can contribute to society generally, including the world of work;
- productive, who gain satisfaction through achievement and who strive for physical well-being;
- cooperative, principled and respectful of others regardless of differences;
- aware of the rights and prepared to exercise the responsibilities of an individual within the family, the community, Canada, and the world (“British Columbia’s Redesigned Curriculum Overview”, n.d.).

### ***Goals.***

According to the British Columbia Ministry of Education the prime goal of public schools is to develop the intellectual capacity of students. This includes thinking skills, skills for learning, and bodies of knowledge (“British Columbia Ministry of Education”, n.d.). In its many documents, the Ministry references the importance of developing “in students a lifelong appreciation of learning, a curiosity about the world around them and a capacity for creative thought and expression” (“British Columbia’s Redesigned Curriculum Overview”, n.d.).

The document continues and identifies goals that the government sees as shared responsibilities between school, the family, and the community. These are divided into three sections. Intellectual Development refers to the ability of students to have the skills and appreciation for lifelong learning (“British Columbia Ministry of Education”, n.d.). Human and Social Development refers to developing a “student’s sense of self-worth and personal initiative,” appreciation of the fine arts, understanding of cultural heritage, “understanding of physical health and well-being... sense of social responsibility,” and “tolerance and respect for the ideas and beliefs of others” (“British Columbia Ministry of Education”, n.d.). Career Development refers to preparing “students to attain career and occupational objectives,” and to develop “effective work habits and the flexibility to deal with change in the workplace” (“British Columbia Ministry of Education”, n.d.). Achieving these three goals requires significant work on non-cognitive skills.

***Foundation.***

British Columbia’s redesigned curriculum has placed non-cognitive skill development as the foundation for developing traditional cognitive development (“British Columbia’s Redesigning Curriculum Overview”, n.d.). That is not to say that cognitive skills will be ignored, rather, the Ministry of Education, working with educators, has taken the very important work done in schools on non-cognitive skills and been declarative about its importance. One way they have done this is to evolve the curriculum model from one driven by knowledge acquisition to one that focuses on understanding of large concepts and ideas based on knowledge acquired through adaptable skill development (“British Columbia’s Redesigning Curriculum Overview”, n.d.). At the centre of these changes are the Core Competencies.



The Core Competencies are seven areas targeting the development of non-cognitive skills. “Core competencies are sets of intellectual, personal, and social and emotional proficiencies that all students need to develop in order to engage in deep learning and life-long learning” (“BC’s New Curriculum Core Competencies”, n.d.). They are divided into three key areas: communication, thinking, and personal and social competencies. The competencies connected to communication and collaboration encompass “the set of abilities that students use to impart and exchange information, experiences and ideas, to explore the world around them, and to understand and to effectively engage in the use of digital media” (“BC’s New Curriculum Core Competencies”, n.d.).

The competencies connected to thinking include critical, reflective, and creative thinking. They encompass “the knowledge, skills and processes we associate with intellectual development. It is through their competency as thinkers that students take subject-specific concepts and content and transform them into a new understanding. Thinking competence includes specific thinking skills as well as habits of mind, and metacognitive awareness” (“BC’s New Curriculum Core Competencies”, n.d.).

The competencies related to personal and social development aim to develop “the set of abilities that relate to students’ identity in the world, both as individuals and as members of their community and society.” This set of competencies encompasses “the abilities students need to thrive as individuals, to understand and care about themselves and others, and to find and achieve their purposes in the world” (“BC’s New Curriculum Core Competencies”, n.d.).

Taken together, these overarching “competencies” direct the education system to focus on the development of non-cognitive skills; thus, signaling the importance of these skills in helping the British Columbia Government achieve its stated mission of enabling students “to develop

their individual potential and to acquire the knowledge, skills, and attitudes needed to contribute to a healthy society and a prosperous and sustainable economy” (“British Columbia Ministry of Education”, n.d.).

***Assessment Plan.***

When things are important, decision makers need to have a way to evaluate them to inform their decisions. The assessment plan for British Columbia’s Core Competencies is to have students self-report their development in these areas (“BC’s New Curriculum Core Competencies”, n.d.). Decision makers, from those directing policy through those in classrooms and homes, require assessment tools to inform the decisions they need to make.

Student self-reporting is a valuable tool to help inform students and to support their growth and development (Andrade, 2019; Duckworth, 2019; Ross, 2006). Student self-reporting can be useful for parents and for teachers, mostly for the conversations that can be generated from the reports. However, beyond this, the utility of self-reports is problematic (Duckworth & Yeager, 2015). Students may read or interpret the competency domain in different ways. Students have biased and narrow perspectives that colour their perspectives (Duckworth & Yeager, 2015; Egalite, Mills, & Greene, 2015; Levin, 2012). In some cases, they lack the information or insight required for effective evaluation of their development. They are insensitive to short- and long-term changes, especially in developmental domains that impair accurate reporting (Duckworth & Yeager, 2015).

The British Columbia Ministry of Education has created profiles to help anchor the student responses, which is one of the “medium-term innovations” that Duckworth and Yeager (2015) identify as useful and will help to mitigate some of the challenges referenced above. However, the most significant problem remains, how will decision makers beyond teachers and

parents get the quality information they need to inform their decision and have confidence in that information? This study addresses these challenges.

### **Definition of the Problem**

Five years into the implementation of British Columbia's Redesigned Curriculum there are no studies about the development of Core Competencies in students despite the important role they play in the redesigned curriculum. Because the skills are student self-assessed and not formally reported on, there are few indications of whether students are growing and improving these non-cognitive skills. Based on a significant body of research (Andrade, 2019; Duckworth, 2019; Duckworth & Yeager, 2015; Kautz, Heckman, Diris, ter Weel, & Borghans, 2014; Messick, 1979; Stecher & Hamilton, 2014; West et al., 2016), the plan to use self-assessment to measure the development of Core Competencies is problematic; however, other alternatives for measurement are equally problematic (Duckworth & Yeager, 2014). In the absence of accepted measurements, decisions continue to be made based on the elements easiest to measure – math, science, reading, writing – as opposed to those more difficult to measure – the “non-cognitive skills” – despite the growing body of research about the importance of the very aptitudes and attitudes the Core Competencies address (Di Fabio & Kenny, 2016; Durlak, et al., 2011; Fadel, Bialik, & Trilling, 2015; Heckman, Stixrud, & Urzua, 2006; Kautz, et al., 2014; Levin, 2012; Lundberg, 2019; Zemsky & Iannozzi, 1995). By examining how closely student self-reporting of their developing Core Competencies is to the assessments of their teachers, and the influences on these assessments, this study presents valuable insight into the accuracy and utility of student self-reporting using descriptive profiles so that decisions about education programming can shift to involve the development of non-cognitive skills.

### **Importance of the Study**

British Columbia's education system has undergone a significant transition in the past 15 years. From being driven by a content coverage-oriented structure to one structured around concepts and big ideas, British Columbia has taken a leadership role in transformative change. By placing non-cognitive skills as the foundation of the redesigned curriculum, British Columbia has been declarative about the importance of developing such skills, despite thriving based on traditional measures. However, without having a comprehensive, proven assessment program, British Columbia risks doubt and ambivalence about these core elements. Does using student self-assessment provide useful, reliable, and meaningful information to policy makers and decision makers? Much research indicates that it does not (Brown, Andrade, & Chen, 2015; Brown & Harris, 2013; Duckworth & Yeager, 2015; Gehbach & Hough, 2018; McKown, 2015; Ross, 2006; Shapiro, Accomazzo, Claassen, & Robitaille, 2015; Stetcher & Hamilton, 2014). However, this is the method chosen by British Columbia for assessing student development of non-cognitive skills. This study was designed to assess the reliability, usefulness, and accuracy of student self-assessments of non-cognitive skills using anchoring profiles provided by the Ministry of Education.

This study contributes to the transformative dialectic that initiated and propelled the curriculum change in British Columbia at a time when people inside and outside the province are watching, ready to judge, based on measured success. If the only measures available and recognized are those things easiest to measure, the point of the transformation will be lost. Non-cognitive skills are key to economic and social growth and development and our public institutions are expected to support their development; however, with no commonly accepted measures, policy and decision makers will act based on what can be easily measured. This study

informs such discussions by providing information about the reliability of student-self assessment of non-cognitive skills and the challenges to that reliability.

Chapter 2 contains a literature review of several key concepts that informed this study. It begins with an examination of non-cognitive skills and their importance to individuals and to the community. The next section looks at how these skills are currently assessed and what some of the challenges for assessing non-cognitive skills are. The final section examines the current research of self-assessment by students.

Chapter 3 provides a detailed description of the methodology used in this study including the process followed, the sample selected, and the data that was collected.

Chapter 4 presents the results of the study, including the different analyses used to arrive at the results presented.

Chapter 5 contains a discussion about the results and the implications those results might have in the school system in British Columbia. It also contains a discussion about the value of self-assessment, some of the cautions found in the research, and suggestions for future research.

## Chapter Two: Literature Review

### Introduction

This chapter begins with a review of literature about non-cognitive skills: what they are and why they are important. Once the terminology is clarified, the impact on the economy, employment, socialization, and education is discussed. Following that review, assessing of non-cognitive skills is presented including the purpose of assessment, the construction of assessment tools, and the usefulness of different assessment tools. The chapter then examines the challenges of assessing non-cognitive skills building from the tools used to understanding what the tools tell administrators. There are many challenges that need to be addressed including diversity of subjects, the fidelity of administration, challenges to validity, and utility of the assessments. The chapter ends with a review of literature specific to student self-assessment, which is at the core of the British Columbia plan.

### Defining Non-Cognitive Skills

#### *Definition*

Non-cognitive skills are often referred to as ‘soft-skills’ and they are more difficult to define and assess than are cognitive skills. Duckworth and Yeager (2015) effectively show the problematic nature of this term, which is “too broad to be useful” and implies “that these are features of human behavior that are devoid of cognition” (Duckworth & Yeager, 2015, p.238). The term often refers to diverse qualities such as goal-directed effort, healthy social relationships, sound judgement and decision-making (Duckworth & Yeager, 2015) and in recent years these skills have taken on greater focus and importance. In her briefing paper to the Economic Policy Institute in 2014, Garcia (2014) included “critical thinking skills, problem solving skills, emotional health, social skills, work ethic, and community responsibility” as non-

cognitive skills. She also included factors affecting personal relationships such as “self-control, self-regulation, persistence, academic confidence, teamwork, organizational skills, creativity, and communication skills” (Garcia, 2014, p. 3). The skills and aptitudes presented in this list require significant cognitive ability; however, “[O]nce the term cognitive is appropriated to refer to intellectual abilities and subject-matter achievement in conventional school areas...the term noncognitive comes to the fore by default to describe everything else” (Messic, 1979, p. 282). This makes the category particularly large and unwieldy. Thus, as Duckworth and Yeager (2015) point out, one of the important things that needs to happen for this area to garner more respect and attention, is for researchers and the broader community of develop an accurate and agreeable vernacular. This is problematic and beyond the scope of this research. However, there needs to be an understanding about how the term “non-cognitive” will be used for the purposes of this paper.

### ***Clarifying Terminology***

There are multiple skills, behaviours, attitudes, and approaches that are commonly referred to and understood when people talk of non-cognitive skills (Zhao, 2020). The first cadre is intrapersonal. They include grit (Duckworth, 2014), self-control (Kenny, et al. 2016), growth mindset (Dweck, 2016), resilience (Seligman, 2011), self-esteem, self-actualization, internal locus of control, self-efficacy (Di Fabio, 2014), self-awareness, open mindedness, curiosity, optimism, adaptability, creative thinking, organization skills, and problem-solving skills. Other non-cognitive skills might be categorized as interpersonal. They include conscientiousness, empathy, gratitude, healthy social skills and relationships, emotional intelligence, social belonging, communication skills, teamwork, and community responsibility (Deming, 2017; Durlak, Weissberg, Taylor, & Schellinger, 2011; Frydenberg, Liang, & Muller, 2017).

One possible overarching area of focus might be Social Emotional Learning (SEL). “The proximal goals of SEL programs are to foster the development of five interrelated sets of cognitive, affective, and behavioral competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision making” (Durlak, et al. 2011, p.406) and this seems to cover many of the associated skills, behaviours, attitudes, and approaches above. However, the concern with using this term is the perceived omission of behaviours and attitudes commonly referenced in current literature such as grit, growth mindsets, resilience, critical thinking, and creativity.

So, for this study the terms ‘non-cognitive’ and ‘non-cognitive skills’ are used advisedly, recognizing their limited accuracy but wanting to make sure SEL, grit, growth mindsets, resilience, critical thinking, and creativity all have a communal place in the conversation as they have been included repeatedly when calls for non-cognitive skill development have been made. Also, the Core Competencies in British Columbia include this broader swath of skills, aptitudes, and aptitudes allowing for greater insight into their assessment.

### **Importance of Non-Cognitive Skills**

Increasingly non-cognitive skills have been identified as important for people to function effectively in our communities. This section looks at the importance of these skills to individuals and to the broader community by looking at the way they impact the economy, employment, community, and the education one receives. Understanding the impact that these skills have on individuals helps explain why they have gained prominence for educators. By understanding the impact that developing these skills in individuals can have for the broader community helps explain why they became the foundation on which the British Columbia school curriculum was built.



*Economic*

According to Labaree (1997) there are three primary foci for education: to provide the skills and knowledge for people to maintain or improve their quality of life; to maintain and improve the community or civilization providing the education; and to improve the economic fortunes of the jurisdiction providing the education. Since 1992 the Organisation for Economic Co-operation and Development (OECD) has led the charge for “measuring education systems” by testing a random sampling of 15-year old youth of member countries in the disciplines of literacy, numeracy, and science. Its stated aim is to help “individuals and nations to identify and develop the knowledge and skills that drive better jobs and better lives, generate prosperity and promote social inclusion” (“OECD Education”, n.d.). They have taken great pains to connect effective education with a growing and vibrant economy (Schleicher, 2018), thus justifying the value of education based on the positive contribution it makes to the economy.

Despite this focus on measuring and valuing cognitive skills, in recent years the OECD has acknowledged the importance of non-cognitive skills. Its rationale, echoing many others (Di Fabio & Kenny, 2016; Duckworth & Yeager, 2015; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Dweck, 2016; Fadel, Bialik, & Trilling, 2015; Heckman, Humphries, & Kautz, 2014; Heckman, Stixrud, & Urzua, 2006), revolves around the unprecedented amount of change we have experienced in the last decade. These changes have occurred in most areas of our lives including societal, economic, and environmental and are driven by “accelerating globalization and a faster rate of technological developments” (OECD, 2018, p. 2).

To prepare our youth for these dynamic challenges, the OECD identifies some aptitudes and attitudes that will be most crucial including curiosity, imagination, resilience, and self-regulation. The OECD (2018) also asserts that youth will have to develop interpersonal skills

and the ability to learn continuously. In other words, despite developing a robust data base founded on measuring cognitive skills – literacy, numeracy, and science – the OECD is increasingly identifying non-cognitive skills as the way forward for students, and, by extension, for healthy, robust economies. This call echoes the work of Heckman, Humphries, and Kautz (2014) who used the American General Educational Development (GED) test to demonstrate how poorly achievement tests predict life success. They argued that achievement tests “do not adequately capture character skills such as conscientiousness, perseverance, sociability, and curiosity, which are valued in the labor market, in school, and in many other domains” (p. 5). They go further and demonstrate the danger of achievement tests as “faith in tests deceives students and policy makers and conceals major social problems” (p. 8) the “continued reliance on the GED is part of a broader pattern of self-deception and misrepresentation in American public life” (p. 36). “Character and intellect are twin pillars supporting flourishing lives. American public policy neglects character and focuses on intellect” (p. 431).

Based on its research and the research of others, the OECD has identified “Key Competencies” youth will need to be able to positively contribute to their respective economies: creating new value, reconciling tensions and dilemmas, and taking responsibility (OECD, 2018). To create new value, according to the OECD research, one must ask questions, think critically, collaborate with others, and think creatively. Reconciling tensions and dilemmas require one to have empathy and respect. In other words, the OECD recognizes the vital importance of non-cognitive skills and aptitudes for youth to meaningfully participate in our economies. The seven Core Competencies specifically target these non-cognitive skills and aptitudes.

### ***Employment***

Other researchers (Di Fabio, 2014; Di Fabio & Kenny, 2016; Kenny, Catraio, Bempechat, Minor, Olle, Blustein, & Seltzer, 2016) have demonstrated the importance of such skills for youth to find success in post-secondary school employment. “[W]orkers in the 21<sup>st</sup> century must engage in continuous learning, develop flexibility, create their own opportunities, exhibit adaptability, maintain their employability, and proactively construct their careers” (Savickas, 2011 as cited in Di Fabio, 2014, p. 98). To do this one needs psychological resources – i.e., self-esteem, purpose in life, self-actualization, internal locus of control, ego strength, ideological commitment – and psychological capital – an individual’s positive psychological state of development which is “characterized by the psychological resources of self-efficacy, hope, optimism, and resilience” (Di Fabio, 2014, p. 100). In the workplace, employers rarely decry the lack of employee reading, writing, numeracy or science skills; rather, they struggle with employee’s self-discipline, setting of goals, taking responsibility and effective listening (National Research Council, 1984; Zemsky and Iannozzi, 1995, as cited in Levin, 2012, p. 273).

Researchers and employers are not the only ones seeing the importance of these skills. Graduates also recognize the importance of non-cognitive skills in their success in work and in their day-to-day lives (Kenny et al., 2016). These skills build on themselves providing exponential value on productivity, schooling, and work experiences (Heckman et al., 2006).

### ***Social***

In her briefing note to the Economic Policy Institute, Garcia (2014) identified the importance of non-cognitive skills not only to the economy, but also to our society. Traits and skills “such as critical thinking skills, problem solving skills, social skills, persistence, creativity,

and self-control...allow them to contribute meaningfully to society and to succeed in their public lives, workplaces, homes, and other societal contexts” (Garcia, 2014, p. 3).

The value of non-cognitive skills goes beyond economic benefits. Heckman and his colleagues (2006, 2010) have done considerable research attempting to ascertain the value of teaching non-cognitive skills. Using the Perry Pre-School Program (a longitudinal study of disadvantaged children who received pro-social treatment beginning at age 3 and lasting for 2 years) for this work, Heckman has conservatively been able to estimate that the “overall social rate of return to the Perry program is in the range of 7% - 10%” (Heckman et al., 2010, p.3). This calculation comes without being able to use data from health outcomes, marital and parental outcomes, the quality of social life, etc. due to their unreliability; however, based on the other benefits shown, it is reasonable to believe that if we could monetize these areas, the return on investment would be higher. “Crime reduction is a major benefit of the program” (p. 6). Heckman demonstrated and has subsequently also found that risky behaviors such as antisocial behavior (aggressiveness, violence, and criminality), cigarette smoking, alcohol use, and the like can be explained by observing the patterns established through the instruction of non-cognitive skills (Heckman, et al., 2006). Heckman’s findings are not unique, other researchers have linked non-cognitive skills with positive long-term life outcomes as well (Almlund et al., 2011; Borghans, Duckworth, Heckman, & Ter Weel, 2008; Salgado, Moscoso, & Berges, 2013).

### ***Educational Outcomes***

Non-cognitive skills are tied to school achievement from elementary through post-secondary (Merchant, Klingler, & Love, 2018). Researchers have found traits such as self-efficacy, confidence, metacognition, and self-regulation to not only have positive effects on student achievement, but also serve as very accurate predictors of student success (ibid). We are

also increasingly aware of the malleability of non-cognitive skills and the ability of schools to grow and develop them (Little, 2017; Zhou, K., 2016). Due to this increased awareness, and the benefits identified above, many educational jurisdictions are attempting to formalize the focus school systems are giving non-cognitive skills (Taylor, Fadel, Kim, & Care, 2020).

Educational policy makers are increasingly recognizing the importance of non-cognitive skills in the policies they are creating. Many school systems around the world have non-cognitive skills as part of their assessment frameworks (Merchant, Klinger, & Love, 2018). This is a clear indication that jurisdictions of education are increasingly valuing the acquisition of non-cognitive skills.

When education systems put these skills as part of accountability measures, school districts are forced to address them. When this happens, educational partners need means with which to measure them to see if progress is being made and the measurement of non-cognitive skills is particularly challenging as will be discussed later. As of March 2020, 18 states in the United States had developed K-12 Social Emotional Learning standards or competencies that can be included in school accountability frameworks (CASEL, 2020). It is interesting that 17 of the 18 states are using age level benchmarks as their measures for student achievement for skills that do not develop in a linear fashion and are not connected to age. Only Maine uses a continuum of proficiency as its means of assessment of non-cognitive skills (Maine, n.d.b), but it is very nebulous and is tailored to graduation not developmental measurement throughout a student's K-12 journey. Maine identifies five guiding principles for its graduates to be: a clear and effective communicator; a self-directed and lifelong learner; a creative and practical problem solver; a responsible and involved citizen; and an integrative and informed thinker (Maine, n.d.a).

In Canada, all provinces assess student progress of non-cognitive skills (Merchant, Klinger, & Love, 2018) to some degree or another. British Columbia, in a recent redesign of its curriculum, has identified seven Core Competencies on which the rest of the curriculum is built: communication; collaboration; creative thinking; critical and reflective thinking; personal awareness and responsibility; positive personal and cultural identity; and social awareness and responsibility. This, along with Australia, is the most complete set of non-cognitive skills of any jurisdiction in the world (Taylor, Fadel, Kim, & Care, 2020). These non-cognitive skills are to be measured from student self-assessment based on descriptive profiles of six level continuums. In addition, British Columbia recently updated its *Enhancing student learning reporting order* and the fifth of five educational outcomes that will be measured, as part of district accountability, directly references the Core Competencies, “Students will have the core competencies to achieve their career and life goals” (BC Ministry of Education, 2020). However, the measure identified by the Ministry of Education for this outcome is the “number and percentage of students transitioning to post-secondary institutions within 1 and 3 years” (ibid). This example speaks, again, to the difficulty of assessing and reporting on the growth of non-cognitive skills; however, it also demonstrates the increased awareness of governing jurisdictions about the importance of these skills.

### ***Conclusion***

“Socially competent students are happier, healthier, and more engaged in learning” (Elliott, Frey, & Davies, 2015, p. 315). Research is increasingly clear about the value of non-cognitive skills and the importance of schools in developing these skills in youth to benefit them, their communities, and the economy (Garcia, 2014; Heckman & Kautz, 2012; Levin 2012; West et al., 2016). Duckworth (2019) recognizes that understanding one’s developmental level of non-

cognitive skills helps guide one's growth. In the same article she explains the challenge that not having useful measurements presents to understanding. Non-cognitive skill development does not receive the recognition and priority it deserves due in large part to the inability to effectively measure the development of these skills (Deming in Lundberg, 2019). This is problematic for several reasons. First, assessment is a critical part of the learning and teaching cycle (Stillman et al., 2018) and non-cognitive skills can be taught (Heckman & Kautz, 2012; Hough, Kalogrides, & Loeb, 2017; Rikoon, Brenneman, & Petway II, 2016); therefore, with our increasing awareness of the importance of non-cognitive skills it seems incumbent on us to assess the development of these skills to supporting their development.

Even asking "the questions may in some cases be as important as the measurement outcome, as the respondents see the desirable response whether they answer truthfully or not" (Frydenberg, Liang, & Muller, 2017, p. 75). Gehlbach and Hough (2018) found that measuring non-cognitive skills changed perceptions about what outcomes schools should prioritize. Increasingly in the United States, non-cognitive skills are being used for school-based accountability (Rikoon, Brenneman, & Petway II, 2016), thus increasing the priority given them in schools. To ascertain whether the work in schools on developing non-cognitive skills is being successful, there need to be some measures. "Without good assessments, teachers, administrators, parents, and policy makers can't get the data they need to make informed decisions" (McKown, 2017, p. 157) and students do not get the feedback they need to facilitate their learning of these skills and aptitudes. Given these findings, the present study that examines student self-assessment of a complete battery of non-cognitive skills could be valuable to the local jurisdiction and to those interested in developing non-cognitive skills in youth.

**Assessment of non-cognitive skills**

Researchers and policy makers believe that non-cognitive skills are important to individual and communal development, growth, and success; however, they do not always receive the attention or priority that they deserve (CASEL, 2020; Deming, 2017; Levin, 2012; Schleicher, 2018; Stecher & Hamilton, 2014). Leaders and policy makers make decisions based on accessible information and when they defend those decisions to the public it is easier when one has data that the public thinks it understands. Therefore, leaders and policy makers in education tend to be guided by what can be measured, and cognitive skills such as reading, writing, and numeracy, are easy to measure: non-cognitive skills such as creativity, social intelligence, and communication are difficult to measure (Heckman, Humphries, & Kautz, 2014). “[M]uch of what schools actually do was ignored, as both national educational systems and international comparisons of educational systems focused almost exclusively on test results and omitted other important aspects that might impart value to educational development and outcomes” (Levin, 2012, p. 271). This study is designed to help bridge this gap by examining under what circumstances student self-assessment of non-cognitive skills can be relied on.

There is an increasing number of measurement tools in the marketplace due to the increased focus on non-cognitive skills and little agreement about how to do that. Haggerty et al. (2011) reviewed seventy-three tools for assessing social emotional learning and only found ten that had sound psychometric properties; were suited to program evaluation; were readily available for schools to access and obtain information about; and were not designed to assess specific programs. There is also little agreement in the literature about how to evaluate assessment tools for non-cognitive skills. Denham (2015), Durlak et al. (2011), Kautz and Zanoni (2014), Li et al. (2010), McKown (2017), Rikoon et al. (2016), Shapiro et al. (2016), and



Stillman (2015) identify different elements that need to be considered when choosing or creating tools to assess non-cognitive skills. However, there are some common themes in the literature to guide the assessment of non-cognitive skills. Understanding the purpose of the assessment, how it is constructed, and how the data can be useful are three important elements.

### ***Purpose of Assessment Tools***

When analyzing or developing assessments, one should begin by understanding the purpose and use of the assessment. What information is required by whom to make what decisions? There are many variables to consider here that will determine the relative quality of different assessment tools. The information required to make decisions about programs or processes requires different assessment tools (Haggerty et al., 2011). Policy makers require different information than do individual students. Summative data is more valuable for policy makers, while formative or interim data is more valuable for students, and assessments that provide screening are more valuable for programs (Denham, 2015). One also needs to be clear about what they want to be assessing: measuring thinking requires different tools than measuring behaviours (McKown, 2019). In choosing assessment tools one needs to determine “the specific, defined needs and functions of their usage” (Denham, 2015, p. 296). Ultimately, as one looks at assessing non-cognitive skill development in youth the data should lead to coherent action by educators. The assessment plan in British Columbia focuses on providing valuable information for students but ignores how it informs programs. This study is designed to see if student self-assessment using standard profiles can achieve both purposes.

### ***Construction of assessment tools***

Assessment tools need to be carefully constructed to assess what they purport to assess as accurately as possible. Considerations such as validity (measures what is intended) and

reliability (measures consistently across uses) (Shapiro, 2015) are important. The content of the assessment tool needs to be appropriate (Denham, 2015) and relevant (Rikoon et al., 2016) for those being assessed to facilitate the accuracy and utility of the assessment tool. Language and terminology should be appropriate in all ways including culturally and developmentally, especially if using tools that involve student responses.

One interesting study by Kautz and Zanoni (2014) used existing administrative data that was readily available to assess non-cognitive skills to help mitigate for the challenges presented by other measures. They used student grades, credits, disciplinary infractions, and absences to assess how using the program OneGoal impacted cognitive skills, non-cognitive skills, educational attainment, and criminality. However, this study seems to be an outlier and does not provide a clear description of the non-cognitive skills it is measuring, thus limiting its use to inform coherent action by educators.

Another important factor when constructing or selecting an assessment tool is how complex it is to administer. If an assessment is labour intensive, too time consuming, or overly complicated, it is not particularly useful beyond isolated applications. The assessment tools need to “be readily available for schools to access and obtain information on” (Haggerty et al., 2011), they need to be flexible to administer, easy to maintain, easy to use, and require minimal technical support (Denham, 2015, p. 297).

The current plan in British Columbia is to use standard profile descriptions of six levels of development for each of the seven Core Competencies. Unlike many current assessments, these are considered a continuum from Kindergarten through graduation and do not change grade to grade. The language used to support self-assessment must be changed to be developmentally

appropriate, but the basic elements are standard. In this study, the verbatim language was used for consistency. This is discussed further in Chapter five.

### ***Utility of Assessment Tools***

Finally, assessment tools need to be useful; “educators must be able to translate results of SEL (Social Emotional Learning) assessments into usable information, decisions, and instructional action” (Denham, 2015, p. 297). In many respects this requirement harkens back to the original one of having a clear purpose, in that if one is clear about the purpose of the assessment, they have already considered how the data will be useful. But, for it to be useful it also needs to be accurate and reliable. There needs to be fidelity in the application of the assessment tool and there needs to be fidelity in the evaluation of the data. Quite often this requires training and practice.

In attempting to assess non-cognitive skills, the “gold standard” of assessment tools is direct observation. Elliott et al. (2015) observed that the term “gold standard” is appropriate due to the costs involved to use such a tool. Observers need to be trained, need time to observe, and then need to translate the results. Similar tools such as interviews and role plays are also used, with similar costs involved. More efficient methods of assessment involve informant ratings, direct assessment, rating scales, and self-reporting, but each has its challenges. There is a constant tension between measurement and use (Gehlback & Hough, 2018). One aim of the current study is to ascertain the utility of student self-assessment based on standard profiles that are used year over year throughout a student’s school journey.

### **Challenges of Assessing Non-Cognitive Skills**

If assessing non-cognitive skills was easy it would already happen as regular part of our program assessments much like reading, writing, and numeracy. Assessing non-cognitive skills

comes with a host of challenges that individuals and groups are attempting to address but do need to be taken into consideration when one wants to implement an assessment program. This section briefly explains some of the challenges faced when wanting to assess non-cognitive skills. First it looks at methods that have been tried and the flaws they all possess. Then it looks at the challenge of getting agreement and understanding of what should be assessed and what is actually being assessed. The diversity of students and the potentially conflicting goals of policy makers can greatly diminish the value of assessments. Finally, this section looks at the challenges presented by fidelity of administration, validity of results, and the utility of the information received from assessment tools.

### ***Challenges to the Different Methods of Assessments***

Education systems are evaluated and ranked based on assessments of cognitive skills (“OECD Education”, n.d.). Based on these numbers, very important decisions are made at the highest levels including resource allocation and policy directions. Despite knowing that world class education systems must develop non-cognitive skills (Schleicher, 2018), they are not part of the assessments used to judge education systems because it is difficult to do. “A small sample of students’ test performances can be obtained at low cost and is believed to have predictive power for further education, occupational success, and earnings” (Levin, 2012, p.271); however, non-cognitive skills have a far greater predictive value for economic and social health than do cognitive skills (Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010; Levin, 2012; West et al., 2016). “There is simply no global agreement on what is of consequence beyond student achievement and how it should be measured” (Levin, 2012, p. 271).

Duckworth and Yeager (2015) effectively outline some of the challenges that researchers face when measuring non-cognitive skills. It is particularly challenging to find quantitative

measures to assess these skills. They examined three common tools – self-report questionnaires, teacher-report questionnaires, and performance tasks – to demonstrate how many of the imperfections of these tools can affect “suitability for program evaluation, accountability, individual diagnosis, and practice improvement” (Duckworth & Yeager, 2015, p.237).

For example, student self-reporting is a valuable tool to help inform students and to support their growth and development. Student self-reporting can be useful for parents and for teachers, mostly for the conversations that can be generated from the reports. However, beyond this, the utility of self-reports is very problematic (Duckworth and Yeager, 2015). Students may read or interpret the competency domain in different ways. Students have biased and narrow perspectives that colour their perspectives. In some cases, they lack the information or insight required for effective evaluation of their development. They are insensitive to short- and long-term changes, especially in developmental domains that impair accurate reporting. As one looks at the various measures of non-cognitive skills, similar challenges emerge for students and teachers alike.

To mitigate some of these challenges, this study looks at the value of student self-assessment using anchoring profiles to assess non-cognitive skills. This methodology provides guidance and direction for students, but can it provide reliable results for use beyond individual benefit?

### ***Understanding What is Being Assessed***

One of the challenges faced in the assessment of non-cognitive skills is the lack of clearly defined language and terminology for non-cognitive skills. Standards state by state vary, thus assessments need to as well (Merchant, Klinger & Love, 2018). For example, it is easy to assess literacy, as there is common agreement that levels of reading, understanding, and writing define

literacy. It is far more difficult to find tools to clearly assess someone's resilience, creativity, or interpersonal skills as one struggles to define consistently what they comprise (Zhou, 2016).

There is considerable effort being made to create assessment tools for non-cognitive skills, but a comprehensive test does not exist. This is due, in large part, to the lack of a unified theory of non-cognitive skills (Frydenberg, 2017).

In addition to the challenge of consistent language is the challenge of breadth of non-cognitive skills as described in the first section of this chapter. By necessity, most existing assessment tools focus on individual traits or characteristics of non-cognitive skills, thus ignoring others (Haggerty, 2011; McKown, 2015). Added to this is debate about what one should be assessing, i.e., thinking, understanding, or behaving for the different non-cognitive skills.

Heckman and Kautz (2012) argue that all cognitive and personality traits are measured using performance on tasks and this makes measurement particularly difficult "because all psychological measurements are calibrated on measured behaviour, and the behaviours used to measure one trait can be influenced by incentives and other traits" (p. 14). The inability to isolate and assess individual traits creates challenges to claims of accuracy and meaning.

British Columbia's seven Core Competencies provide the most complete suite of non-cognitive skills of any educational jurisdiction in the world (Taylor, Fadel, Kim, & Care, 2020).

This study examined at the reliability of assessments in all seven Core Competencies and provides insight into some of the challenges assessing different types of non-cognitive skills.

### ***Diversity of Students and Goals***

There are other factors that cause challenges to accuracy and meaning. Unlike mathematics and reading, many non-cognitive skills develop very asynchronously as humans grow and develop, so creating base-line measures poses a significant challenge. "Recent work

shows that social emotional learning measures are much less correlated across grades than academic work” (Gehlback & Hough, 2018, p. 13).

Despite this, most of the current assessment tools, and associated literature, call for or provide base-line data for their measures and many “measures were initially developed and validated using data from predominantly European American, middle-income samples or clinical samples” (Daneri et al., 2018, p. 16). As Zhao (2020) comments on, there are discussions and debates about the ideological underpinnings of increased focus on non-cognitive skills. Cultural and ethnic differences can influence non-cognitive skills (Appiah, K., 2007; Barblett & Maloney, 2010; Danari, Sulik, Raver, & Morris, 2018). For example, some indigenous, Eastern, and Caribbean cultures consider making eye contact disrespectful, aggressive, and unapproachable (Akechi, et al., 2013); however, some observational assessments use this as a measure of social awareness and positive relationship skills (Daneri, Sulik, Raver, & Morris, 2018; Frydenberg, Liang, & Muller, 2017). Gender roles and expectations vary in different cultures and will impact the demonstration of interpersonal skills and social awareness (Appaih, K., 2007; Gutman, A., 2007; Okin, S., 2007). Language skill is another significant variable for two reasons: the ability to respond to questions; and the ability to articulate feelings, thoughts, and considerations. Without accounting for this in the assessments further challenges their utility. Connected to language skills is the cognitive level of those being assessed (Barblett & Maloney, 2010). This provides another challenge to the accuracy and meaning of assessments, especially of non-cognitive skills such as creativity, collaboration, and social emotional learning.

This study factors in literacy levels, socio-economic backgrounds, gender, and ethnicity in student self-assessments and the assessments teachers make of student development in the different Core Competencies. It also controls for teacher diversity.

### ***Fidelity of Assessment Administration***

Fidelity of assessments is another significant challenge to assessing non-cognitive skills. This challenge manifests itself in several ways. The demonstration of non-cognitive skills is particularly sensitive to contexts such as current emotional state, culture and climate of a school, and incentives (Heckman & Kautz, 2012). The way a teacher presents the assessment tool has a differing impact for students as do ‘satisficing’ and social desirability bias (Gehlback & Hough, 2018). Another significant challenge to fidelity of assessment is the characteristics of the adults administering the assessment tool (Brown, Andrade, & Chen, 2015). One example is the ability to administer the tool: the more complicated the tool, the more training and practice will be required for those administering it to maximize the fidelity of use. On the other side of this is having the training and experience required to interpret the results of the data and translate them into usable information. All of this is predicated on the ability of the assessor being able to avoid common traps of bias (desirability, cultural, demographic) and inference.

For this study, the same person administered the assessment tool for all subjects following a prescribed script and approach.

### ***Validity of Assessment Results***

Another area of challenge for credible assessment of non-cognitive skills is that of validity (Merchant, Klinger & Love, 2018; Zhou, 2016)). Much of the research into assessing non-cognitive skills is spent addressing this issue using psychometric measures to demonstrate validity (Daneri, Sulik, Raver & Morris, 2018; DeRosier & Thomas, 2018; Pandero, Brown, & Strijbos, 2016). As mentioned above, fidelity of assessment is particularly challenging, and this translates to challenges for psychometrics as the consistency of preparation for and administration of self-assessments is difficult to control (Brown, Andrade & Chen, 2015).



Observer and reporter bias are challenging to account for when measuring observations and rater scales (Egalite, Mills, & Greene, 2016). Meaning belongs to individuals rather than to the assessor, which makes accurate assessment difficult (Barblett & Maloney, 2010) especially when using comparisons to ascertain validity.

Student activity is another challenge as many will modify their behaviours because they are being assessed (DeRosier & Thomas, 2018). As mentioned above, many measures were validated using a very small sampling of human beings which causes significant questions about validity when used with socioeconomically, racially diverse, or gender diverse groups (Danari, Sulik, Raver, & Morris, 2018).

Gehlbach and Hough (2018) address this in their study and challenge those that demand rigid psychometrics to demonstrate validity. They argue that a “validated scale” is a mythical entity, and that validity is an ongoing process dependent upon whether or not a measure assesses what it sets out to assess “in a particular context for a particular population and for a particular use” (p. 4). Due to the proliferation of assessment tools and the uniqueness of assessment needs, this approach to validity might be the most useful. Trying to use psychometrics to validate assessments for a mass market seems misguided. It might make more sense to work towards viridity – honesty, truthfulness, voracious self-assessment – rather than validity. Considering the multiple challenges to assessing non-cognitive skills, having an assessment tool that has clear purpose and use, that over time provides accumulated evidence that logically informs decision makers, and that can be easily administered, could provide reliable and accurate results leading to coherent action by educators.

The central purpose of this study is to examine how accurate student self-assessments of their development of non-cognitive skills is, how it can be made more accurate, and how that

information can be used in the broader system. The system introduced in British Columbia has students use the same anchored profiles to assess their development throughout their school journey. However, there is currently no recognition or plan to be able to use these assessments to inform systemic decisions or policies, nor is there analysis about how differences between students might impact their assessments. This study aims to address these deficits.

### ***Utility of Non-Cognitive Assessments***

One final challenge to assessing non-cognitive skills is the question about what will be done with the results. As mentioned above, one key component to assessment is understanding what decisions are going to be made with the information collected. On the positive side of the equation, Marzano (2015) advocates for assessments to put students in charge of their own success which then makes the students think deeply about their skills (p. 346) and just asking the questions can be valuable and important for student development (Frydenberg, 2017). It seems positive that just the act of measuring social emotional learning is changing perceptions about what outcomes schools should be working towards (Gehlback & Hough, 2018), and the growing confidence that schools can contribute to student growth in non-cognitive skills is leading to the use of them for school accountability measures; but this can have a negative effect as well. As soon as the stakes raise for assessments, then nefarious behaviours manifest. The irony of this is recognized, but unavoidable in high-stakes assessments.

If student self-assessments can be easily obtained, as is the case in British Columbia, and are reliable, then they can be used to better inform decision making and policy development.

### **Self-Assessment of Non-Cognitive Skills**

One of the challenges facing researchers in this area is the breadth of the domain (Andrade, 2019). According to Brown and Harris (2013) self-assessment should be regarded as a

process that involves identifying the characteristics of one's own work and determining the value or merit of that work. When applied to education many challenges surface from how best to use self-assessment to the purpose of said assessment (Gehlback & Hough, 2018). Teachers use student self-assessment in ever increasing contexts; however, there is little consistency in the way it is administered and the way the information is used (Brown, Andrade & Chen, 2015; Pandero, Brown & Strijbos, 2016; Pandero, Jonsson & Botella, 2017).

Self-assessment provides multiple challenges as an assessment tool; however, it provides opportunities for improving student self-regulated learning and self-efficacy (Pandero, Jonsson & Botella, 2017). According to Taras (2015), self-assessment “has been demonstrated as an efficient means of supporting student learning” (p. 2) since it was introduced in the US in the 1930's but is still not widely used. There are several reasons for this, not least of which is the issue of grading accuracy which has been a “long and perennial concern” (p.6).

As Gehlbach and Hough (2018) state, “concerns about the validity of the inferences that might be drawn from student self-reports persist” (p. 1). There have been many attempts to improve validity in student self-reporting. According to Pandero, Brown, and Strijbos (2016) “research makes it clear that students are aware that the teacher is the most expert person in the classroom” (p. 813); however, Brown and Harris (2013) found that the correlation between self-ratings and teacher ratings tended to be weakly positive. Using multiple research bases, Brown, Andrade & Chen (2015) identified several challenges to watch for when investigating accuracy including safety in the classroom. However, rather than disregarding self-assessment as a valuable measure, researchers are working “to create the optimal conditions for accuracy” while avoiding “known pitfalls, which include issues of reliability, grading, social response bias,

response style, and trust/respect” (p. 15). This is due, in large part, to the values student self-assessment offer.

Pandero, Brown, and Strijbos (2016) identified four reasons that student self-assessment is important. Students who use self-assessment have shown increases in their learning and academic performance; show increased use of self-regulated learning strategies; often have enhanced self-efficacy; and show more ownership of their learning (p. 804). Yan, Brown, Lee, & Qui (2020) are more strident in their claims that from a pedagogical perspective “effective learning can only occur when students have a realistic sense of their own performance” (p. 509) and that when compared to other teacher-directed formative assessment methods self-assessment has many advantages “as long as students have intentions and appropriate skills” (p. 510). Student self-assessment should be regarded as a learning strategy rather than as a substitute for other types of evaluative or summative assessment (Boud, 1999; Brown & Harris, 2014; Panadero & Alonso-Tapia, 2013; Yan, 2019).

Developing the appropriate skills for self-assessment requires work in several areas. Pandero, Brown, and Strijbos (2016) indicate four aspects that students need experience, in both the task being assessed and student self-assessment: practice; “an incremental, structured implementation of SSA [student self-assessment]” (p. 819); identifying most effective instructional practices for implementing different student self-assessment formats; and an increase on learning the process for student self-assessments as well as domain knowledge (pp. 819 – 820). Student self-assessment is not as simple as having students reflect on their learning to identify routes for growth. Students need to have the skills to self-assess as well as the skills and knowledge to know what they are assessing.

The second required element for successful student self-assessment is intent (Yan, Brown, Lee, & Qui, 2020), yet there is “relatively little research focusing on students’ intentions to conduct self-assessment and factors that influence students’ intentions and practices pertaining to self-assessment (p. 510). “Self-assessment is, by its nature, a personal endeavor that requires volitional effort and commitment” (p. 511). To assess the impact of intention on student self-assessment, Yan et al. used the cyclical process model of self-assessment (Yan & Brown, 2017) to identify the concrete actions students usually take for self-assessment. They modified Ajzen’s Theory of Planned Behaviour (1991) by adding psychological safety as a sixth predictor of student behaviour for their study. Yan, Brown, Lee & Qui (2020) found that student intentions to conduct self-assessment can be predicted and found that “students’ self-assessment practices can be predicted by their intentions, their perceived behavioural control, and their sense of psychological safety” (p. 520); however, “that the formation of self-assessment relies on the synergy of a variety of factors, rather than one or two determinant predictors” (ibid.). To use student self-assessment effectively, one must attend to these influences of student intention.

The plan in British Columbia is supported by the research about the value of self-assessment for the individual. This study is designed to see if other elements, such as the anchored profiles, mitigate for the challenges presented by self-assessment for use beyond the individual.

### ***British Columbia’s Core Competency Profiles***

To guide student self-assessment, the Ministry of Education in British Columbia has provided descriptive profiles of seven sub-competencies (BC’s New Curriculum Core Competencies, n.d.). The descriptors are progressive and additive and not tied to grade level as they reflect lifelong development. In 2001 British Columbia released Performance Standards for

Reading, Writing, Numeracy, and Social Responsibility (Government of British Columbia, 2020). The standards focused exclusively on performance assessment by teachers. The performance standards were criterion referenced to enable teachers, students, and parents to compare student performance to provincial standards. They were separated by grade and each area had four levels of student performance in terms of prescribed learning outcomes relevant to the key areas. They were developed by educators based on research current at the time. These profiles were not research tested for reliability or accuracy. They were used extensively by practicing professionals who found them to be useful. School goals and learning plans used these standards for data throughout the early 2000's.

As British Columbia redesigned its curriculum and place Core Competencies as the foundational, cross-curricular element, designers looked to the Performance Standards for guidance (N. Walt, personal communication, January 14, 2021). Different districts were asked to develop profiles on a lifelong continuum that described student development in six sub-competencies. These descriptors were made public for use and feedback in 2014. The BC Education Ministry collected the feedback and re-released the assessment profiles for use in 2015. In 2020 a seventh sub-competency was introduced demonstrating the vital and evolving nature of the redesign of curriculum in British Columbia. The profiles have not been tested for reliability and debate exists about their utility. The present study aims to close this gap and provide a foundation for future directions to increase their systemic utility.

## **Conclusion**

Non-cognitive skills encompass several domains. The first domain contains intrapersonal skills and the second contains interpersonal skills. These skills have been shown to be particularly important for the quality of one's life (Kenny et al., 2016), their post-secondary

school employment (Di Fabio, 2014), the economy and society (Garcia, 2014). “Socially competent students are happier, healthier, and more engaged in learning” (Elliott, Frey, & Davies, 2015, p. 315) and these skills can be taught (Heckman & Kautz, 2012). Assessment is an important part of the learning cycle (Stillman et al., 2018) and can contribute significantly to student growth and development if done well. Assessments are also important when analyzing policies and procedures. Finally, assessments should lead to coherent action by educators to improve the non-cognitive skills of their students.

To have effective assessment tools there needs to be a clear purpose for the assessment that involves clearly defining who needs what information to make what decisions. From there, the assessment tools need to provide that information in a way that is easily administered and useful. This is much easier said than done. Many challenges exist in assessment generally, but in the assessment of non-cognitive skills particularly. The breadth of skills considered non-cognitive skills combined with the diversity of definitions make having a coherent, complete, universal assessment impossible.

Trying to have standardized measures is particularly challenging for many reasons, not least of which are the asynchronous development of non-cognitive skills and the many contextual factors that impact them. Considering meaning belongs to the individual, assessor and assessed, the fidelity of assessment is particularly challenging and that further exacerbates the challenges to validity. However, Gehlbach and Hough (2018) provide a useful framework through which validity can be viewed and that can provide guidance for assessing non-cognitive skills. Due to the diversity of this domain, the contextual sensitivity, and the importance of assessment for student development, developing assessment tools that are flexible enough to be used in a variety of contexts, at the student level, and on a continuum could prove valuable.

Different assessment tools serve different purposes and clarity of purpose is tantamount for selecting them. The existing assessment tools for non-cognitive skills serve specific, finite conditions and goals. “The taxonomy for each assessment tool is slightly different” (Haggerty, 2011, p.6). Being aware of the many challenges to assessing non-cognitive skills is helpful when designing or selecting an assessment tool, and the framework outlined in the next section should prove helpful in this enterprise.



### **Chapter Three: Methodology**

#### **Overview**

This chapter describes the dataset used for this research study and provide a description of the study's variables, methodology, and limitations. The purpose of this research study was to understand the reliability and accuracy of student self-assessment of non-cognitive skills using anchor profiles. To do this, the study examines the relationship between student self-assessments of their development of non-cognitive skills with the assessments of their teachers at a middle school in British Columbia. Prior to conducting any data collection or analysis of data, the researcher received Institutional Review Board (IRB) approval from the University of Kansas.

The study conducted analyses of data collected from 324 students and 16 teachers from a small middle school in the Comox Valley School District on Vancouver Island in British Columbia. The school serves 360 students from grades six through nine and has an entire staff of 54 people. This community school is situated in a low socio-economic part of the school district. This school is somewhat atypical as it has very few students from minority backgrounds and 31% of the students attending the school have Indigenous ancestry.

I am a mid-career, Caucasian, male and am the Principal of the school. I have been a teacher for 23 years and an administrator in this district for 18 years. I have served as the Principal of this school for the past five years and have hired all but two of the teachers currently on staff.

This school was chosen for several reasons. The age of the students allows for a mid-point check about the reliability of student self-assessment. Grade seven is seen as the end of elementary school and grade ten is the beginning of the provincial Graduation Program. Students in this school have homeroom teachers, with teaching partners, for all core subjects and

for two consecutive years. This structure offers teachers good knowledge about individual student development and should provide the most accurate way for second party assessment of student development of non-cognitive skills.

The focus of this study is on assessments of student development in seven competencies deemed important for student development by the Ministry of Education in British Columbia (British Columbia Ministry of Education, n.d.c.). Over the past ten years the government of British Columbia redesigned the curriculum used in their schools. The new curriculum has seven Core Competencies as the foundation.

Core Competencies are sets of intellectual, personal, and social and emotional proficiencies that all students need in order to engage in deep, lifelong learning.

Along with literacy and numeracy foundations, they are central to British Columbia's K-12 curriculum and assessment system and directly support students in their growth as educated citizens (BC's New Curriculum Core Competencies, n.d.).

Currently the plan for assessing student development of the Core Competencies is through student self-assessment. As presented in Chapter Two, research raises questions about the reliability of student self-assessments (Duckworth & Yeager, 2015). However, one mitigating factor in this study is that the student self-assessments are based on developmental profiles that are described for each Competency, used throughout the province and at each grade level. By using anchored profiles, the accuracy of student self-assessment should improve. To understand the usefulness of such student self-assessments from anchored descriptors this study compares student assessments of their own development with the assessments by their teachers using the same profiles as a way to support the reliability of student self-assessments.

### **Research Questions**

As mentioned in Chapter One, the research questions for this study are:

1. Is there a relationship between student self-assessments, using prescribed profiles, of Core Competencies in British Columbia, and the assessments given by their teachers when measuring student development of the seven identified Core Competencies?
2. Is this relationship robust to gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, student attendance, student tardiness, or student behaviour?
3. How do gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with student self-assessment of their development in each of the seven Core Competencies?
4. How do student gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with teacher assessments of student development in each of the seven Core Competencies?

### **Dataset**

In March 2021, teachers and students at a middle school in British Columbia completed a questionnaire designed to elicit assessments based on student development in each of the seven Core Competencies in British Columbia's education curriculum. This school has students in grades six through nine. Every class is a split class – students in grades six and seven are together as are students in grades eight and nine. Students have a homeroom teacher who is responsible for their learning program: each homeroom teacher has a teaching partner. The two teachers are responsible for the education program for all 50 students in their care. Students remain with their homeroom teacher for two years. For example, a student in grade six will have the same homeroom teacher when in grade seven, but then a different one when they enter grade

eight for that year and the next. The school is the only middle school in the mid-sized school district (8,600 students with 1,600 employees) in a community of 64,000 people. Students at the school come from the immediate community with fewer than 5% having to be bused from more than 4 kilometers away.

Students in all four grades, 324 in total, completed the questionnaire (Appendix A) as part of their annual self-reporting of their development. One change, for the students, was that for the purpose of this study I met with each class and followed a prescribed script and process to maximize the fidelity of this study. Under normal circumstances these assessments are done by the students with their homeroom teachers guiding them. Sixteen teachers were asked to complete a related questionnaire (Appendix B), given a consent form, and reminded repeatedly of the voluntary nature of their participation. All 16 completed the questionnaires recording their assessment of their students' development in each of the seven Core Competencies.

Below is a table of the basic demographics of participants in this study. Of a total school population of 360 students, 324 provided responses to the questionnaire, a 90% participation rate. Most of the students are currently in grade seven. Of the sample, 57% are male and 51% participate in the subsidized food program. Students of Indigenous heritage comprise 31% of the total student population and account for 31% of this study. As the table below demonstrates, this study had a highly representative sample group by all measures as compared to the population. All homeroom teachers chose to participate in this study.

Table 3.1 contains demographic information about the students and teachers in this study.

**Table 3.1**

***Study Demographics***

Student demographics		N	%
Grade level	Grade 6	80	89
	Grade 7	97	88
	Grade 8	80	92
	Grade 9	67	92
Gender	Male	185	90
	Female	139	93
Socio-Economic level	Low	165	87
	Average	159	93
Indigenous Ancestry		101	94
Special Education Designations		61	88
Teacher demographics			
Gender	Male	10	63
	Female	6	37
Years of experience	<5 years	6	37
	5 – 10 years	5	31
	>10 years	5	31

**Variables**

To answer the research questions, many variables were used in this study, but can be divided into three main categories. The first group is assessments of student development in each of the seven Core Competencies used as the foundation for British Columbia's K-12 curriculum. This first group was used to answer the central research question of this study: Is there a relationship between student self-assessments, using prescribed profiles, of Core Competencies in British Columbia, and the assessments given by their teachers when measuring student development of the seven identified Core Competencies?

To answer the other research questions a second group of variables that impact students was used as was a third which contains student behaviour variables. This section describes the variables in each group.

### *Assessment Variables*

There are two original assessment variables for each student, their self-assessment of their development of each Core Competency and their teachers' assessments of their development in each Core Competency. For each Core Competency there are six descriptive profiles that can be selected to indicate student development for that competency area (Appendix C). For this study, each profile description was read to the students and they were asked to indicate which profile best described their level of development. Their responses were recorded numerically, one through six, for each of the Core Competencies.

The teachers were asked to read the profiles and indicate which of the six profiles best described the development of each student in their homeroom. Teachers were also asked to provide the same information for the students in their teaching partner's homeroom as they also work with those students and know them well. Their responses were recorded numerically, one through six, for each of the Core Competencies. This provided the study with three measures of student development for each Core Competency. For analysis, the two teacher assessments for each student were averaged to get a single score between one and six for each student.

What follows are the summative descriptors for each profile for each of the seven Core Competencies taken from the BC Ministry of Education website (BC's New Curriculum Core Competencies, n.d.). A more comprehensive description of the profiles of each Core Competency can be found in Appendix C.

**Communicating Core Competency.**

Communicating encompasses the set of abilities that people use to impart and exchange information, experiences, and ideas; to explore the world around them; and to understand and effectively use communication forms, strategies, and technologies.

Profile 1 – In a safe and supported environment, I respond meaningfully to communication from peers and adults.

Profile 2 – In familiar settings, I communicate with peers and adults.

Profile 3 – I communicate purposefully, using forms and strategies I have practiced.

Profile 4 – I communicate clearly and purposefully, using a variety of forms appropriately.

Profile 5 – I communicate confidently, using forms and strategies that show attention to my audience and purpose.

Profile 6 – I communicate with intentional impact, in well-constructed forms that are effective in terms of my audience and in relation to my purpose.

**Collaborating Core Competency.**

Collaborating involves the skills, strategies, and dispositions that people use to work together to pursue common purposes and accomplish common goals.

Profile 1 – In familiar situations, I can participate with others.

Profile 2 – In familiar situations, I cooperate with others for specific purposes.

Profile 3 – I contribute during group activities with peers and share roles and responsibilities to achieve goals.

Profile 4 – I can confidently interact and build relationships with other group members to further shared goals.

Profile 5 – I can facilitate group processes and encourage collective responsibility for our progress.

Profile 6 – I can connect my group with other groups and broader networks for various purposes.

### **Creative Thinking Core Competency.**

Creative Thinking involves the generation of ideas and concepts that are novel and innovative in the context in which they are generated, reflection on their value to the individual or others, and the development of chosen ideas and concepts from thought to reality.

Profile 1 – I get ideas when I play.

Profile 2 – I can get new ideas or build on or combine other people’s ideas to create new things within the constraints of a form, a problem, or materials.

Profile 3 – I can get new ideas in areas in which I have an interest and build my skills to make them work.

Profile 4 – I can get new ideas or reinterpret others’ ideas in novel ways.

Profile 5 – I can think “outside the box” to get innovative ideas and persevere to develop them.

Profile 6 – I can develop a body of creative work over time in an area of interest or passion.

### **Critical and Reflective Thinking Core Competency.**

Critical and Reflective Thinking encompasses a set of abilities that students use to examine their own thinking and that of others. It involves making judgments based on reasoning, where students consider options, analyze options using specific criteria, and draw conclusions.

Profile 1 – I can explore.

Profile 2 – I can use evidence to make simple judgments.



Profile 3 – I can ask questions and consider options. I can use my observations, experience, and imagination to draw and make judgments.

Profile 4 – I can gather and combine new evidence with what I already know and develop reasoned conclusions, judgments, or plans.

Profile 5 – I can evaluate and use well-chosen evidence to develop interpretations; identify alternatives, perspectives, and implications; and make judgments. I can examine and adjust my thinking.

Profile 6 – I can examine evidence from various perspectives to analyze and make well-supported judgments about and interpretations of complex issues.

### **Personal Awareness and Responsibility Core Competency.**

Personal Awareness and Responsibility involves understanding the connections between personal and social behaviour and well-being' it encourages people to make constructive and ethical decisions and act on them.

Profile 1 – I can show a sense of accomplishment and joy, and express some wants, needs, and preferences. I can sometimes recognize my emotions.

Profile 2 – I can initiate actions that bring me joy and satisfaction and recognize that I play a role in my well-being.

Profile 3 – I can make choices that help me meet my wants and needs and increase my feelings of well-being. I take responsibility for my actions.

Profile 4 – I can recognize my strengths and take responsibility for using strategies to focus, manage stress, and accomplish my goals.

Profile 5 – I recognize my value and advocate for my rights. I take responsibility for my choices, my actions, and my achievements.

Profile 6 – I can identify my strengths and limits, find internal motivation, and act on opportunities for self-growth. I take responsibility for making ethical decisions.

**Positive Personal and Cultural Identity Core Competency.**

Positive Personal and Cultural Identity involves the awareness, understanding, and appreciation of the factors that contribute to a healthy sense of oneself; it includes knowledge of one's family background, heritage(s), language(s), beliefs, and perspectives in a pluralistic society.

Profile 1 – I am aware of myself as different from others.

Profile 2 – I am aware of different aspects of myself. I can identify people, places, and things that are important to me.

Profile 3 – I can describe different aspects of my identity.

Profile 4 – I have pride in who I am. I understand that I am part of larger communities.

Profile 5 – I understand that my identity is influenced by many aspects of my life. I am aware that my values shape my choices and contribute to making me a unique individual.

Profile 6 – I can identify how my life experiences have contributed to who I am; I recognize the continuous and evolving nature of my identity.

**Social Awareness and Responsibility Core Competency.**

Social Awareness and Responsibility involves the awareness, understanding, and appreciation of connections among people, including between people and the natural environment. Social awareness and responsibility focuses on interacting with others and the natural world in respectful and caring ways.

Profile 1 – I can be aware of others and my surroundings.

Profile 2 – In familiar settings, I can interact with others and my surroundings respectfully.

Profile 3 – I can interact with others and the environment respectfully and thoughtfully.

Profile 4 – I can take purposeful action to support others and the environment.

Profile 5 – I can advocate and take action for my communities and the natural world. I expect to make a difference.

Profile 6 – I can initiate positive, sustainable change for others and the environment.

### ***Student Variables***

From existing data sources this study uses variables of student demographics, student academic development, and student behaviours to examine how they might moderate student and teacher assessments of Core Competency development.

#### **Demographic Variables.**

Gender was coded as 0 for males and 1 for females. As few students in this study identify as other, and gender identity for some is very fluid, biological binary records were used to indicate gender. Of the 324 students, 57% are male and 43% female.

There are four grade levels in this study. Twenty-five percent are in grade six and coded with a 1. Thirty percent are in grade seven and coded with a 2. Twenty-five percent are in grade 8 and coded with a 3. Twenty percent are in grade nine and coded with a 4.

Students are identified as either low socio-economic level or average based on participation in the subsidized lunch program at the school. Students who participate in the lunch program, 51% of students, are coded with a 0, while all others were coded with a 1.

Despite having students from multiple ethnicities participate in the study, for privacy and due to small numbers of other ethnic groups only students of Indigenous ancestry are identified separately. Thirty-one percent of study participants have Indigenous ancestry and were coded with a 1 and everyone else with a 0.

**Table 3.2*****Student Demographic Variables***

Variable description	Value labels	N	%	Code
Grade level	Grade 6	80	89	1
	Grade 7	97	97	2
	Grade 8	80	80	3
	Grade 9	67	67	4
Gender	Male	185	90	0
	Female	139	93	1
Socio-economic level	Low	165	87	0
	Average	159	93	1
Ethnicity	Other	223	90	0
	Indigenous	101	94	1

**Academic Development Variables.**

Despite having multiple categories of student with special needs, for the purpose of this study, any student with a defined designation was included as having special needs. Nineteen percent of the students in this study have identified special needs and are coded with a 0. All other students are coded with a 1.

Another important developmental variable used in this study is student proficiency in fundamental skills. These skills are reading, writing, and numeracy. For this study, individual student results are collected from three sources of data. In British Columbia, students are assessed in these core areas in grade four and again in grade seven. Based on student results on these standardized tests, student proficiency is identified as emerging (the student demonstrates an initial understanding of the concepts and competencies relevant to the expected learning), developing (the student demonstrates a partial understanding of the concepts and competencies relevant to the expected learning), proficient (the student demonstrates a complete understanding

of the concepts and competencies relevant to the expected learning), or extending (the student demonstrates a sophisticated understanding of the concepts and competencies relevant to the expected learning). A third measure of student proficiency of fundamental skills is teacher assessment in each of the three areas. Students with emerging fundamental literacy skills are coded with a 1. Students with developing fundamental literacy skills are coded with a 2. Students with proficient fundamental literacy skills are coded with a 3. Students with extending fundamental literacy skills are coded with a 4. After running a Principal Component Analysis on the academic proficiency measures, a composite variable was created due to their covariance. This composite was used in analysis to indicate overall student fundamental skill proficiency.

**Table 3.3*****Student Academic Development Variables***

Variable description	Variable labels	N	%	Code in study
Students with designations	Does not have a designation	263	93	0
	Has a designation	61	86	1
Reading level	Emerging	43	13	1
	Developing	124	38	2
	Proficient	129	40	3
	Extending	27	8	4
Writing level	Emerging	49	15	1
	Developing	130	40	2
	Proficient	117	36	3
	Extending	28	9	4
Numeracy level	Emerging	39	12	1
	Developing	131	40	2
	Proficient	119	37	3
	Extending	35	11	4

These data are important to collect for this study to identify whether student self-assessment is moderated by their academic proficiency as well as any potential impact it has on

teacher assessments of student development in each of the Core Competencies. It is also important to help understand how robust teacher assessments of student development of Core Competencies is to these variables.

### **Student Behaviour Variables.**

Three variables of student behaviour are also included in this study. These measures were all taken at the end of the school day on Friday, March 19, 2021. Student attendance records range from missing no days of school to missing 89 days of school in the present school year. At the time of this study was conducted there had been 122 school days in the year. Once the data was collected, the researcher divided the results into three groups attempting to get them as balanced as possible. Table 3.4 presents this information. Students with six or fewer absences, 104 students, are coded with a 1. Students with more than six absences and less than 17, 113 students, are coded with a 2. Students with 17 or more missed days of school, 107 students, are coded with a 3.

The number of times a student was late was also measured and ranged from not being late at all to being late for school 58 days in the year. Again, the researcher divided these students into three groups of approximately the same size. Students who had no recorded late arrivals to class, 90 students, are coded with a 1. Students with at least one late reported and ten or fewer, 161 students, are coded with a 2. Students with more than 10 reported late arrivals, 71, are coded with a 3.

The final measure of student behaviour was the number of discipline records a student had in the current school year. This number ranged from none (84% of students) to four discipline records (3%). Most of the students, 272, had no records of discipline for the current school year and are coded with a 0. Students with one discipline record on their record, 30

students, are coded with a 1. Students with more than one discipline record from the current school year, 22 students, are coded with a 2.

**Table 3.4**

***Student Behaviour Variables***

Variable description	Variable labels	N	%	Code in study
Absenteeism	0 – 6 days absent	104	32	1
	6.5 – 16.5 days absent	113	35	2
	17 – 89 days absent	107	33	3
Tardiness	None	92	28	1
	1 – 10 times late	161	50	2
	11 – 58 times late	71	22	3
Discipline records	None	272	84	0
	1	30	9	1
	More than one	22	7	2

These variables are important to the study to examine the moderating effect student behaviours have on student self-assessment and teacher assessment of student development of Core Competencies.

**Method of Analysis**

This research study explored the relationship between student self-assessments in each of seven Core Competencies and teacher assessments of student development in each of the seven Core Competencies.

Before analyses was run for this study, several composite variables were created. To increase the accuracy of teacher assessments, each student had two teachers assess their development in each Core Competency based on the six profile levels. These two scores were

averaged, and that number was used to compare student self-assessment results with teacher assessment results.

Another variable that was created before analysis began was the difference between teacher assessments and student self-assessments. This was done by subtracting each student's self-assessment score from the corresponding teachers' composite score for each of the Core Competencies.

Student behaviour records were organized to allow for enough students in each group to accurately analyze. To do this each category was fitted to include approximately one-third of the sample. Student discipline records had a range of none to four, but most had none, and few had four so three codes were created one for students with no discipline records, one for students with one discipline record, and a third category for those with more than one discipline record. Similarly, student absenteeism was divided into three groups for analysis: those who have missed six days or less of school, those who have missed more than six days but less than 17 days, and those who have missed 17 or more days of school this school year. Tardiness was divided using the same logic: those with no recorded lates, those with between one and ten lates, and those who have been late more than 10 times.

Another variable that was created before analysis was a composite for student fundamental skill proficiency. There was a very strong and significant correlation between student proficiency in reading, writing, and numeracy so these variables were combined into one using Principal Component Analysis. These variables were also confirmed using Cronbach's Alpha to measure the internal consistency of scores within each measure. The internal consistency reliability for each item was well beyond the 0.7000 threshold for reliability, so the composite variable pc1 was created to represent student fundamental skill proficiency.



**Table 3.5*****Alpha Reliability Fundamental Skills Proficiency***

Assessment	Number of Items on Scale	Cronbach's Alpha
Grade 4 FSA Reading	191	0.856
Grade 4 FSA Writing	186	0.857
Grade 4 FSA Numeracy	190	0.852
Grade 7 FSA Reading	209	0.856
Grade 7 FSA Writing	182	0.858
Grade 7 FSA Numeracy	210	0.853
Current year Reading	269	0.823
Current year Writing	270	0.813
Current year Numeracy	270	0.826
Fundamental Skills Composite	269	0.813
Test scale		0.857

**Research Question 1:** Is there a relationship between student self-assessments, using prescribed profiles, of Core Competencies in British Columbia, and the assessments given by their teachers when measuring student development of the seven identified Core Competencies?

This question is answered by comparing student self-assessment of their development in each of the seven Core Competencies with the assessments generated by their teachers. Because the study was focused on examining the reliability of student self-assessments, each student's development was assessed by two teachers and a teacher composite score was used for the teacher assessment score. This was done by using the mean of the two teacher scores for each student and each Core Competency. The student self-assessment scores were then compared to the teacher composite scores to identify the level of correlation between the two for each of the seven Core Competencies.

**Research Question 2:** Is this relationship robust to gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, student attendance, student tardiness, or student behaviour?

Once the relationship between the student self-assessments and the teacher assessments of the students was established, the study explored if the relationship is moderated by the different variables. To answer this question the study used ordinary least squares (OLS) regressions to estimate the relationship between student self-assessments and the assessments their teachers made of their development in each on the seven Core Competencies. Independent variables were then regressed to understand how robust the relationship is between student and teacher assessments when controlling for the demographic and school-related variables. The first model regressed teacher scores of student development on the scores students gave themselves to identify to what extent student scores predict the scores given by their teachers. The second model controlled for the myriad of factors individual teacher diversity brings to their assessments. Each teacher was individually put into the regression to control for their impact on the predictive relationship between students and teachers. Next, student demographic data including the grade level of the students, gender, socio-economic level, and whether the student had Indigenous ancestry were controlled for. Finally, student academic development, whether the student had a special education designation, student behaviours were included in the regression. Student behaviours were represented by measures of absenteeism, tardiness, and behaviour records.

**Research Question 3:** How do gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with student self-assessment of their development in each of the seven Core Competencies?

Two more composites were created to help with analyzing data for questions three and four. When calculating Cronbach's Alpha for teacher assessments of students in each of the seven Core Competencies and when students assessed themselves, there was very high correlation, so a composite variable was created for each by generating a mean for each group.

**Table 3.6*****Alpha Reliability Student Self-Assessments***

Core Competency	Number of Items on Scale	Cronbach's Alpha
Communication	322	0.834
Collaboration	322	0.834
Creative Thinking	322	0.840
Critical and Reflective Thinking	322	0.842
Personal Awareness and Responsibility	321	0.824
Positive Personal and Cultural Identity	321	0.840
Social Awareness and Responsibility	321	0.832
Test scale		0.855

**Table 3.7*****Alpha Reliability Teacher Assessments of Students***

Core Competency	Number of Items on Scale	Cronbach's Alpha
Communication	324	0.927
Collaboration	324	0.923
Creative Thinking	324	0.932
Critical and Reflective Thinking	324	0.929
Personal Awareness and Responsibility	324	0.926
Positive Personal and Cultural Identity	324	0.931
Social Awareness and Responsibility	324	0.928
Test scale		0.938

Two tests were run to identify variables that consistently impacted student self-assessments in the Core Competencies. The first was a bivariate analysis of each variable with

student self-assessments. A second bivariate correlation chart was created for student self-assessments of their development in each of the Core Competencies and variables. The first chart was used to identify correlation between student self-assessments generally and the variables; the second was used to understand possible correlations unique to specific Core Competencies.

**Research Question 4:** How do student gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with teacher assessments of student development in each of the seven Core Competencies?

As for question three, two tests were run to identify variables that consistently impacted teacher assessments of student development of Core Competencies. The first was a bivariate analysis of each variable with teacher assessments. A second bivariate correlation chart was created for teacher assessments of student development in each of the Core Competencies and variables. The first chart was used to identify correlation between teacher assessments generally and the variables; the second was used to understand possible correlations unique to specific Core Competencies.

## **Challenges**

### ***Bias***

Assessor bias is a risk to valid results (Duckworth & Yeager, 2015). Based on observations of teacher reporting of non-cognitive skills of students, teachers struggle to see beyond behaviours and personalities in these assessments. Students who demonstrate challenging behaviours regularly are assessed in non-cognitive domains more harshly than those who do not have such behaviours or personalities, even when the teachers are well trained and aware of this bias. To mitigate this, this study had two teachers assess each child's development

and the average of the two assessments was used when analyzing the data. Another measure used to mitigate this in the current study was to use student behaviour data as a variable that could impact teacher and student assessments.

### ***Student literacy***

Another challenge to validity that was anticipated was student reading levels. For those students with low reading levels – at a reading level of grade four or lower – Education Assistants sat with them to make sure they understood what was being asked of them and what they were responding. The student assessments were administered by the same administrator who read each profile to all students to mitigate for the potential impact of limited literacy. Also, data of student reading proficiency was collected and analyzed for potential impact on student and teacher assessments.

### ***Fidelity***

Another area of concern in such studies is fidelity. There are three areas of fidelity that are of concern: teaching fidelity, student fidelity, and assessment fidelity. One cannot be controlled for, one can be somewhat controlled for, and one can be controlled for. Teaching fidelity was not controlled for in this study as it would involve changing and prescribing teacher practice which is against teacher contracts in British Columbia. Student fidelity, the effort and commitment students put into the assessment, can only partially be controlled for by using assessment fidelity. For this study, every effort was made by the administrator to encourage and support each student to take the assessment faithfully and to be as accurate in their self-assessment as possible. To control for assessment fidelity, one person administered the assessments for all students in each class to ensure equitable application of the assessment.

### *Efficiency*

One of the challenges for assessments of non-cognitive skills is the efficiency with which they can be administered. Administering this assessment tool to students took 45-minutes with each class to complete. This study involved the assessment of many non-cognitive skills. The accuracy of student self-assessment needs to be balanced with the efficiency of this process to assess its value.

### *High-stakes testing*

One significant area of conflict anticipated is about the reporting of non-cognitive skills in general. By measuring the development of these skills, decision makers can make more informed decisions about policy and practice; but, by measuring non-cognitive skills to be reported on, there is a potential for the negative trappings of measurement and reporting. The reporting of non-cognitive skills allows for the ranking of schools and programs and as soon as that happens, there are pressures for unethical practices that lead to inflation of scores and misdirected practice: the focus of work in schools changes from improving student success to improving the statistics. One purpose of having the Core Competencies self-assessed was so that such abuses did not happen and so that the focus remained firmly on student metacognition and social development (“British Columbia’s Provincial Curriculum and Assessment Development Process”, n.d.). The purpose of this study is not to work against these values; however, there is a need to make informed decisions about policy and practice and there needs to be some way to inform these decisions.

### **Conclusion**

This study was designed to identify the relationship between student self-assessments and teacher assessments of non-cognitive skills as well as some moderating factors to help

understand the reliability of such assessments in reporting student development. Students in grades six through nine at a middle school in British Columbia participated in this study as did their teachers. The data collected included student self-assessments of their development of non-cognitive skills as well as the assessments from their teachers. Student demographic and developmental variables were used to identify potential moderating factors as were student behaviour variables.

This chapter provided an overview of the study's methodology by describing the profile descriptions used for assessments used and sample used for this study. The chapter discussed the variables relevant to the study and provided an outline of the statistical analyses used to answer the research questions posed, as well as anticipated challenges for this study. The following chapter discusses the results of these analyses.

## Chapter Four: Results

The study conducted analysis of data collected from 324 students and 16 teachers. The focus was on assessments of student development in seven competencies deemed important for student development by the Ministry of Education in British Columbia. Over the past ten years the government of British Columbia redesigned the curriculum used in their schools. The new curriculum has seven Core Competencies as the foundation.

Core Competencies are sets of intellectual, personal, and social and emotional proficiencies that all students need in order to engage in deep, lifelong learning.

Along with literacy and numeracy foundations, they are central to British

Columbia's K-12 curriculum and assessment system and directly support students in their growth as educated citizens (BC's New Curriculum Core Competencies, n.d.).

The plan for assessing student development of the Core Competencies is through student self-assessment. To understand the usefulness of student self-assessments from anchored descriptors this study compared student assessments of their own development with the assessments by their teachers using the same profiles to answer the four research questions.

### Dataset

The school used for this study is the only middle school in the mid-sized school district (8,600 students with 1,600 employees) in a community of 64,000 people. Students at the school come from the immediate community with fewer than 5% having to be bused from more than four kilometers away. Below is a table of the basic demographics of participants in this study. Of a total school population of 360 students, 324 provided responses to the questionnaire, a 90%



participation rate. Most of the students are currently in grade seven. Of the sample, 57% are male and 51% participate in the subsidized food program. Students of indigenous heritage comprise 31% of the total student population and account for 31% of this study. As the table below demonstrates, this study had a highly representative sample group by all measures. All homeroom teachers chose to participate in this study. Table 3.1 contains demographic information about the students and teachers in this study.

Students and teachers completed assessments of student development in each of seven Core Competencies. For each, there are six descriptive profiles that range from basic – profile one – to highly developed – profile six. Table 4.1 presents the mean and standard deviation for each assessment source for each of the Core Competencies. Not only were student self-assessments higher than teachers' assessments for each Core Competency, but the standard deviations were greater as well showing much more variability in assessments. Considering the profiles are reported on a six point scale, a three would indicate basic development in the given domain. As mentioned above, the lower the score the more basic the student's development is for the Core Competency. The higher the score the more developed and complex a student's skills become.

**Table 4.1***Assessment Results*

	Teacher Assessment		Student Assessment	
	Mean	SD	Mean	SD
Communication	3.03	0.91	3.19	1.13
Collaboration	2.84	0.92	3.12	1.17
Creative Thinking	2.88	0.87	3.40	1.40
Critical and Reflective Thinking	2.87	0.80	3.17	1.21
Personal Awareness and Responsibility	2.93	0.85	3.13	1.29
Positive Personal and Cultural Identity	3.35	0.78	3.68	1.38
Social Awareness and Responsibility	2.94	0.81	3.34	1.36

**Analysis***Analysis 1: Research Questions 1 and 2*

*Is there a relationship between student self-assessments, using prescribed profiles, of Core Competencies in British Columbia, and the assessments given by their teachers when measuring student development of the seven identified Core Competencies?*

*Is this relationship robust to gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, student attendance, student tardiness, or student behaviour?*

What follows are the tables for the regressions for each of the seven Core Competencies and summary analysis from the tables. Each table reports the coefficient for the predictive relationship for each variable and the standard error for that variable. The tables include the constant for teacher scores and the adjusted  $R^2$  to account for the estimated predictive value of all variables used together in each model. The level of significance is also indicated for each coefficient.

**Communication Core Competency.****Table 4.2**

*Estimates of effects on teacher assessment of student development of Communication Core Competency*

	Model One		Model Two	
	Coefficient	Standard Error	Coefficient	Standard Error
Student Score	0.15***	0.05	0.08**	0.03
Grade Level			0.10	0.08
Being female			0.18**	0.08
Average SES			0.08	0.08
Indigenous Ancestry			-0.07	0.08
SPED			-0.24**	0.10
Fundamental Literacy Level			0.34***	0.03
Discipline records			0.04	0.07
Tardiness			0.00	0.06
Absenteeism			-0.14***	0.05
Controlled for teacher fixed effect				√
Constant	2.54***	0.15	2.96***	0.25
Adjusted R <sup>2</sup>	0.03***		0.52***	

\*\*\*p≤0.01

\*\*p≤0.05

\*p≤0.10

For every unit of increase in student scores based on the anchor profiles for the Communication Core Competency one can expect a 0.15 unit increase in teacher scores. This is a significant relationship, but minimal and is noticeably reduced when other variables are controlled for. The relationship is robust when controlling for teacher effects and minimally impacted when controlling for student demographics and behaviours. However, having a special education designation predicts moderately lower teacher assessments of student development of communication skills while increased student literacy predicts noticeably higher assessments.

Several things stand out in this table. While grade level, socio-economic level, and Indigenous ancestry were significant when introduced to these regressions it was due to their correlation to students having a special education designations or fundamental literacy levels. Being female remained significant when controlling for other factors and has a positive correlation with teacher scores, but a minimal effect.

The combined effect of the independent variables used accounted for 52% of covariance with teacher assessments.

**Collaboration Core Competency.****Table 4.3**

*Estimates of effects on teacher assessment of student development of Collaboration Core Competency*

	Model One		Model Two	
	Coefficient	Standard Error	Coefficient	Standard Error
Student Score	0.24***	0.04	0.11***	0.03
Grade Level			0.15**	0.08
Being female			0.19***	0.08
Average SES			0.28***	0.08
Indigenous Ancestry			0.06	0.08
SPED			-0.34***	0.10
Fundamental Literacy Level			0.29***	0.03
Discipline records			-0.01	0.07
Tardiness			0.00	0.05
Absenteeism			-0.14***	0.05
Controlled for teacher fixed effect				√
Constant	2.09***	0.14	2.31***	0.25
Adjusted R <sup>2</sup>	0.09***		0.52***	

\*\*\*p≤0.01

\*\*p≤0.05

\*p≤0.10

For every unit of increase in student scores based on the anchor profiles for the Collaboration Core Competency one can expect a 0.24 unit increase in teacher scores. This is a significant relationship, and the regression line is steeper than was the correlation between student and teacher assessments of the Communication Core Competency. Of the seven Core Competencies, student self-assessments most correlate with teacher assessments for the Collaboration Core Competency. The relationship is robust when controlling for teacher effects but is negatively impacted when controlling for other variables.

Several things stand out in this table. Student demographics such as grade level, being female, and socio-economic level have a reliable correlation to teacher assessments, but only having an average socio-economic level predicted noticeable increases. Developmentally, having a special education designation correlated most strongly with teacher assessments with a negative correlation of  $r = 0.34$ , that is teachers tended to assess students with designations significantly lower than those without. For development of collaboration skills academic proficiency is correlated with teacher assessments as consistently as socio-economic status; it is a moderately strong correlation.

The combined effect of the independent variables used accounted for 52% of covariance with teacher assessments.

**Creative Thinking Core Competency.****Table 4.4**

*Estimates of effects on teacher assessment of student development of Creative Thinking Core Competency*

	Model One		Model Two	
	Coefficient	Standard Error	Coefficient	Standard Error
Student Score	0.11***	0.03	0.04	0.03
Grade Level			0.00	0.08
Being female			0.18**	0.08
Average SES			0.03	0.08
Indigenous Ancestry			0.09	0.08
SPED			-0.03	0.11
Fundamental Literacy Level			0.37***	0.03
Discipline records			0.03	0.07
Tardiness			-0.09	0.05
Absenteeism			-0.06	0.05
Controlled for teacher fixed effect				√
Constant	2.51***	0.13	2.68***	0.24
Adjusted R <sup>2</sup>	0.03***		0.44***	

\*\*\*p≤0.01

\*\*p≤0.05

\*p≤0.10

For every unit of increase in student scores based on the anchor profiles for the Creative Thinking Core Competency one can expect a 0.11 unit increase in teacher scores. This is a significant relationship with a very gradual regression line that is noticeably reduced to 0.04 when other variables are controlled for. Student self-assessments of their development of creative thinking skills explain about 3% of predicting teacher scores. The relationship is robust when controlling for teacher effects.

The only variable to be correlated noticeably with teacher assessments was a student's fundamental literacy level with a correlation of  $r = 0.37$ . Being female was statistically significant but had minimal effect on teacher assessments.

When all variables are included in the regression, less than 45% of the co-variance is explained.



**Critical and Reflective Thinking Core Competency.****Table 4.5**

*Estimates of effects on teacher assessment of student development of Critical and Reflective Thinking Core Competency*

	Model One		Model Two	
	Coefficient	Standard Error	Coefficient	Standard Error
Student Score	0.17***	0.04	0.06**	0.03
Grade Level			0.12**	0.06
Being female			0.05	0.06
Average SES			0.06	0.07
Indigenous Ancestry			-0.01	0.07
SPED			0.03	0.09
Fundamental Literacy Level			0.32***	0.03
Discipline records			-0.05	0.06
Tardiness			-0.05	0.05
Absenteeism			-0.05	0.04
Controlled for teacher fixed effect				√
Constant	2.31***	0.12	2.95***	0.20
Adjusted R <sup>2</sup>	0.07***		0.56***	

\*\*\*p≤0.01

\*\*p≤0.05

\*p≤0.10

For every unit of increase in student scores based on the anchor profiles for the Critical Thinking Core Competency one can expect a 0.17 unit increase in teacher scores. This is a significant relationship and the Core Competency with the second closest correlation between student self-assessments and the assessments by their teachers, but when other variables are controlled for it becomes minimal. However, it is still a very small correlation. Student self-assessments of their development of critical and reflective thinking skills explain about 7% of predicting teacher scores. The relationship is robust when controlling for teacher effects and when controlling for student demographics, fundamental literacy skills are moderately correlated with teacher assessments and the correlation is statistically significant.

When all variables are included in the regression 56% of the co-variance of teacher assessments is explained.

**Personal Awareness and Responsibility Core Competency.****Table 4.6**

*Estimates of effects on teacher assessment of student development of Personal Awareness and Responsibility Core Competency*

	Model One		Model Two	
	Coefficient	Standard Error	Coefficient	Standard Error
Student Score	0.11***	0.04	-0.01	0.03
Grade Level			0.12	0.07
Being female			0.12	0.08
Average SES			0.23**	0.08
Indigenous Ancestry			0.06	0.08
SPED			-0.25**	0.10
Fundamental Literacy Level			0.27***	0.03
Discipline records			-0.10	0.07
Tardiness			-0.08	0.06
Absenteeism			-0.12**	0.05
Controlled for teacher fixed effect				√
Constant	2.58***	0.12	2.77***	0.24
Adjusted R <sup>2</sup>	0.03***		0.47***	

\*\*\*p≤0.01

\*\*p≤0.05

\*p≤0.10

For every unit of increase in student scores based on the anchor profiles for the Personal Awareness and Responsibility Core Competency one can expect a 0.11 unit increase in teacher scores. This is a significant relationship with a very gradual regression line that is reduced to half a percent when the other variables are controlled for. Student self-assessments of their development of personal awareness and responsibility skills explain about 3% of the covariance in teacher scores. The relationship is robust when controlling for teacher effects.

Socio-economic level and fundamental literacy level are positively correlated with teacher assessments while having a special education designation is negatively correlated. For every unit increase in teacher assessments, one can expect approximately a 25% increase for each of the three variables when controlling for other variables.

When all variables are included in the regression, 47% of the co-variance is explained.

**Positive Personal and Cultural Identity Core Competency.****Table 4.7**

*Estimates of effects on teacher assessment of student development of Positive Personal and Cultural Identity Core Competency*

	Model One		Model Two	
	Coefficient	Standard Error	Coefficient	Standard Error
Student Score	0.10***	0.03	0.05*	0.03
Grade Level			0.10	0.07
Being female			0.15**	0.07
Average SES			0.17**	0.08
Indigenous Ancestry			0.05	0.08
SPED			-0.13	0.10
Fundamental Literacy Level			0.23***	0.03
Discipline records			-0.01	0.07
Tardiness			0.06	0.06
Absenteeism			-0.10**	0.05
Controlled for teacher fixed effect				√
Constant	3.00***	0.12	3.29***	0.24
Adjusted R <sup>2</sup>	0.03***		0.61***	

\*\*\*p≤0.01

\*\*p≤0.05

\*p≤0.10

For every unit of increase in student scores based on the anchor profiles for the Positive Personal and Cultural Identity Core Competency one can expect a meagre 0.10 unit increase in teacher scores. This is the lowest correlation coefficient between student self-assessments and those of their teachers of all seven Core Competencies before controlling for other variables. This is a significant relationship with a very gradual regression line. The relationship is robust when controlling for teacher effects. Only fundamental student literacy has a noticeable correlation with teacher assessments of development of positive personal and cultural identity.

When all variables are included in the regression, 61% of the co-variance is explained.

**Social Awareness and Responsibility Core Competency.****Table 4.8**

*Estimates of effects on teacher assessment of student development of Social Awareness and Responsibility Core Competency*

	Model One		Model Two	
	Coefficient	Standard Error	Coefficient	Standard Error
Student Score	0.10***	0.03	0.05*	0.03
Grade Level			0.12	0.07
Being female			0.26***	0.07
Average SES			0.18**	0.08
Indigenous Ancestry			0.12	0.08
SPED			-0.25**	0.10
Fundamental Literacy Level			0.21***	0.03
Discipline records			-0.06	0.07
Tardiness			-0.09	0.06
Absenteeism			-0.12***	0.05
Controlled for teacher fixed effect				√
Constant	2.59***	0.12	2.39***	0.25
Adjusted R <sup>2</sup>	0.03***		0.40***	

\*\*\*p≤0.01

\*\*p≤0.05

\*p≤0.10

For every unit of increase in student scores based on the anchor profiles for the Social Awareness and Responsibility Core Competency one can expect a 0.10 unit increase in teacher scores. This is the second lowest correlation coefficient between student self-assessments and those of their teachers of all seven Core Competencies before controlling for other variables and is noticeably reduced when other variables are controlled for. This is a significant relationship with a very gradual regression line. The relationship is robust when controlling for teacher effects. Being female is positively correlated with teacher assessments, predicting a 26% increase, while having special education designation is negatively correlated at a similar level. Fundamental literacy levels were, again, noticeably correlated with teacher assessments.

When all variables are included in the regression, 40% of the co-variance is explained.

### **Conclusion.**

Based on the analyses of the data above, there is a minimal relationship between student self-assessments, using prescribed profiles, of each Core Competency in British Columbia, and the assessments given by their teachers when measuring student development in the seven identified Core Competencies. Student self-assessments are positively correlated with those of their teachers with correlation coefficients ranging from 0.10 (Positive Personal and Cultural Identity Core Competency) to 0.24 (Collaboration Core Competency). This relationship is robust to different teachers providing the assessments. This relationship is robust to student grade level, student behaviours, student absenteeism, and student tardiness. Though negatively correlated with teacher assessments, the correlation between student self-assessments and those of their teachers is robust to students having Indigenous ancestry. However, the relationship is not robust, in varying degrees, to gender, socio-economic level, or having special education designations. The relationship between student self-assessments and the assessments given by



their teachers is correlated far more closely with student fundamental skill development than any other variable used in this study.

***Analysis 3: Research Question 3***

*How do gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with student self-assessment of their development in each of the seven Core Competencies?*

Additional analyses were run to explore how student self-assessments are correlated with different variables. The first step was to create the bivariate correlation chart below to identify the correlation between the different variables. As mentioned in Chapter three, using Chronbach's alpha to assess the correlation between student self-assessments between each of the seven Core Competencies, the average mean was used to create a single student self-assessment variable for the bivariate correlation chart. The only variable to have a correlation greater than  $r = 0.25$  was teacher assessments of student development in the Core Competencies. So, little correlation was found between student self-assessments and any other variable across the Core Competencies as can be seen on Table 4.9.

The next analysis was done using a bivariate table showing student self-assessments of the different Core Competencies to see if any correlations were found unique to specific Core Competencies. As can be seen on Table 4.10, the assessments between the different Core Competencies are moderately correlated, but nothing else is. The most highly correlated Core Competencies are Personal Awareness and Responsibility Core Competency and Social Awareness and Responsibility Core Competency with a correlation of 0.57. The next highly correlated is Personal Awareness and Responsibility with the student self-assessments of Collaboration Core Competency



**Table 4.10***Bivariate Correlation Chart of Student Self-Assessments of Their Development in each Core Competency*

	Communication	Collaboration	Creative Thinking	Critical and Reflective Thinking	Personal Awareness and Responsibility	Positive Personal and Cultural Identity	Social Awareness and Responsibility
Communication	1.00						
Collaboration	0.51***	1.00					
Creative Thinking	0.46***	0.44***	1.00				
Critical and Reflective Thinking	0.41***	0.47***	0.49***	1.00			
Personal Awareness and Responsibility	0.49***	0.56***	0.45***	0.45***	1.00		
Positive Personal and Cultural Identity	0.42***	0.38***	0.37***	0.41***	0.52***	1.00	
Social Awareness and Responsibility	0.52***	0.46***	0.44***	0.32***	0.57***	0.52***	1.00
Grade level	0.03	0.05	-0.08	0.03	0.07	0.10*	-0.01
Being female	-0.04	-0.10*	-0.01	-0.08	-0.07	-0.02	-0.03
Average SES	0.11**	0.21***	0.21***	0.18***	0.17***	0.18***	0.17***
Indigenous ancestry	-0.14**	-0.06	-0.03	-0.05	-0.11**	-0.12**	-0.11**
Special education designation	-0.14**	-0.16***	-0.11**	-0.13**	-0.20***	-0.18***	0.13**
Fundamental skill proficiency	0.12**	0.19***	0.20***	0.28***	0.23***	0.12**	0.12**
Disciplinary actions	-0.11**	-0.13**	-0.01	-0.02	-0.05	-0.08	-0.09*
Absences	-0.05	-0.13*	0.00	0.01	-0.14**	-0.14**	-0.15***
Tardiness	-0.07	-0.14**	-0.05	-0.02	-0.11*	-0.14***	-0.15***
	***p<0.01	**p<0.05	*p<0.10				

***Analysis 4: Research Question 4***

*How do student gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with teacher assessments of student development in each of the seven Core Competencies?*

Additional analyses were run to explore how teacher assessments are correlated with different student variables. The first step was to create the bivariate correlation chart above (Table 4.10) to identify the correlation between different variables. As mentioned above, due to the high correlation between teacher assessments of student development between each of the seven Core Competencies, the average mean was used to create a single teacher assessment variable. Three variables were noticeably correlated with teacher assessments greater than  $r = 0.30$ . The correlations between student socio-economic level ( $r = 0.37$ ) and teacher assessments and the relationship between having a special education designation ( $r = -0.38$ ) are moderately correlated; however, they are both overshadowed by the 0.69 correlation between student proficiency of fundamental skills and teacher assessments of student development in the Core Competencies.

The next step was to look for correlations unique to different Core Competencies. As with the student self-assessments, teacher assessments between Core Competencies were correlated, but in this case, they were highly correlated. As with the student self-assessments, the strongest correlation was between teacher assessments of Personal Awareness and Responsibility Core Competency and Social Awareness and Responsibility Core Competency with an  $r = 0.82$  correlation. This was followed by the correlation between Personal Awareness and Responsibility Core Competency and their assessment of student development of Collaboration Core Competency with a 0.78 correlation. Of note, British Columbia has divided the seven Core

Competencies into three related areas: Communication, Thinking, and Personal and Social. The teacher assessments were most strongly correlated with fundamental skill proficiency in the Thinking Competencies, followed closely by the Communication competencies, and least correlated in the Personal and Social Competencies. In fact, when all variables were controlled for, only 40% of the covariance was explained of teacher assessments of Social Awareness and Responsibility, while 61% was explained of teacher assessments of student development of Positive Personal and Cultural Identity Core Competency.

Unlike the students, three of the other variables had noticeable correlation to teacher assessments: socio-economic level, having a special education designation, and most noticeably the students' fundamental skills proficiency level. Interestingly, the correlation of student fundamental skills proficiency was less in the Social and Personal Core Competencies than in the Communication or Thinking Core Competencies.

**Table 4.11*****Bivariate Correlation Chart of Teacher Assessments of Student Development in each Core Competency***

	Communication	Collaboration	Creative Thinking	Critical and Reflective Thinking	Personal Awareness and Responsibility	Positive Personal and Cultural Identity	Social Awareness and Responsibility
Communication	1.00						
Collaboration	0.78***	1.00					
Creative Thinking	0.68***	0.65***	1.00				
Critical and Reflective Thinking	0.74***	0.67***	0.77***	1.00			
Personal Awareness and Responsibility	0.66***	0.78***	0.60***	0.65***	1.00		
Positive Personal and Cultural Identity	0.66***	0.69***	0.59***	0.62***	0.71***	1.00	
Social Awareness and Responsibility	0.62***	0.74***	0.61***	0.60***	0.82***	0.69***	1.00
Grade level	0.11*	0.06	0.04	0.06	0.10*	-0.12**	0.11*
Being female	0.12**	0.11**	0.12**	0.05	0.10*	0.16***	0.18***
Average SES	0.27***	0.38***	0.24***	0.27***	0.36***	0.31***	0.32***
Indigenous ancestry	-0.15***	-0.10*	-0.08	-0.09	-0.13**	-0.08	-0.08
Special education designation	-0.37***	-0.41***	-0.25***	-0.27***	-0.36***	-0.26***	-0.34***
Fundamental skill proficiency	0.65***	0.62***	0.62***	0.71***	0.55***	0.51***	0.46***
Disciplinary actions	-0.09	-0.14**	-0.02	-0.08	-0.18***	-0.11**	-0.15***
Absences	-0.17***	-0.21***	-0.13**	-0.10*	-0.19***	-0.16***	-0.19***
Tardiness	-0.08	-0.10*	-0.11**	-0.11*	-0.14**	-0.06	-0.14**
	***p≤0.01	**p≤0.05	*p≤0.10				

**Summary**

This chapter presented the data that were collected for this study and the quantitative analysis used to answer the research questions. Descriptive statistics regarding the sample population used for the study were also presented. Results indicate that there is considerable difference between student self-assessments of their development of Core Competencies and the assessments their teachers make of their development. None of the variables collected were noticeably correlated to student self-assessments and provide minimal predictive power. Results indicate that socio-economic level might impact teacher assessments of student development as might student gender; however, the data clearly showed a strong and significant correlation between student proficiency in fundamental skills and the level of Core Competency development assessed by their teachers. The following chapter will discuss the research findings in greater depth.

## CHAPTER FIVE: Discussion and Conclusions

This research study was designed to inform the conversation about British Columbia's plan to use student self-assessment for the foundation of their redesigned curriculum. Over the past ten years, British Columbia has been redesigning their K-12 curriculum with cross-curricular Core Competencies as the foundation. There are seven defined Core Competencies that can be grouped into three domains: Communication, Thinking, and social emotional learning referred to as Personal and Social Core Competencies. Assessment of such non-cognitive skills can be challenging (Duckworth & Yeager, 2015; Elliott, Frey, & Davies, 2015; Haggerty, Elgin, & Woolley, 2011). Students are to develop these skills over their years in school and to self-report on their development every year. To do this, six descriptive profiles have been created for each Core Competency to demonstrate the different levels of development for each. This is the only discrete measure of student development in these areas that are deemed fundamental to student and community success. Using teachers as knowledgeable observers of student development, this study explored the relationship between student self-assessments of their development in the seven Core Competencies and the assessments their teachers made of student development. The thought was that if teacher observations were similar to those of students it would strengthen the case for the viridity of student self-assessment. It also looked at how robust those relationships are when controlling for different variables. Finally, this study identifies some of the variables that impact student and teacher assessments of these non-cognitive skills. Neither source of assessments is reliable or valid, but student self-assessments have considerable value.



The next section has a discussion of the findings from this study followed by a section that presents some of the implications for practice. Following that is a section describing some of the limitations of this study and areas for future research.

## **Discussion of Findings**

### ***Research Question 1***

Is there a relationship between student self-assessments, using prescribed profiles, of Core Competencies in British Columbia, and the assessments given by their teachers when measuring student development of the seven identified Core Competencies?

Although there is a positive correlation between teacher assessment of student Core Competencies and the self-assessments of the students, the correlation is not strong. Student self-assessments are consistently higher than those of their teachers and are more variable, with standard deviations as much as 75% greater than their teachers' assessments (Table 4.2). Noticeably, the variability of assessments between teachers and students is least for the "Communication" Core Competencies – Communication and Collaboration – with the other five Core Competencies being more variable with a 50% greater standard deviation for student self-assessments. Further to this, this study found that student self-assessments of the Personal and Social Core Competencies are the least related to teacher assessments of the three Core Competency areas. Through the analyses, this study controlled for individual teacher bias and differences, finding they have very minimal impact on the relationship between student and teacher assessments.

The positive but weak correlation between assessments aligns with much of the literature on teacher and student assessment of this nature (Brown & Harris, 2013); it is challenging to attain reliable, efficient, data of non-cognitive skill development (British Columbia, n.d.a.;

Denham, 2015; Duckworth & Yeager, 2015). In this study several factors contribute to the lack of meaningful correlation of assessments.

Levels of understanding are different between students and teachers and between different students. The profiles used by the British Columbia Ministry of Education contain statements that require interpretation. For example, the most basic level of proficiency for the Communication Core Competency is “[I]n a safe and supported environment, I respond meaningfully to communication from peers and adults.” Students and their teachers need to interpret and understand several key terms in this seemingly simple phrase. What is considered safe? What is an environment? What is meaningfully? Throughout the Core Competencies, challenges such as these exist which contribute to varied understanding and impact the relationship between assessments.

Another impact on the understanding of Core Competencies is the relationship teachers and students have with the Core Competencies. Teachers know what they are teaching. In British Columbia they are tasked with integrating the Core Competencies within their curricula. They do this consciously, aware of the different elements they are supporting their students to develop. Rarely are the students aware of these elements. For example, when I asked each class about the different types of communication they use during the day, in formal classes and out of class time, students in every class identified talking but not listening. They identified, with prompting, texting and one class identified writing. That was all. Teachers, on the other hand, strategically include reading, writing, speaking with different audiences, listening actively, electronic presentation skills, and multi-source information gathering, to name a few, into most lessons. Students are unaware of this and often overlook their own multi-model proficiency. While this does not explain why students assess themselves more proficient in this area than their

teachers do, it does go a long way to explaining why the relationship between the assessments is weak.

Connected to this, students and teachers have very different reference points. When asked to self-assess, a students' points of reference are their peers and their families (Roeser, Eccles, & Sameroff, 2000). When asked to assess student development, teachers' reference points are the class and every other student they have taught in that age range. Consequently, students and teachers see different things related to the assessment profiles. Within a class, students observe and understand their context and place in that context. When in groups, they recognize their contributions, but that recognition is always filtered through their priorities and proclivities. When completing such assessments, students often reflect on their most recent experiences. Teachers observe from afar and consider multiple experiences when assessing student development of non-cognitive skills. The difference of reference points likely contributes to the weak correlation of assessments (Caskey & Anfara, Jr., 2014; Wang & Millward, 2014; Watt, 2004; Zlotnik & Toglia, 2018).

On the six profile scales used, teacher understanding of the most complex development level and student understanding of the most complex level of development is necessarily different in all seven Core Competencies. Teachers have much more life experience in addition to their work experience which gives them a deeper, more complete understanding of what significant development in each area can and does look like than do their 13-year-old students. From that vantage point, their assessments of their students will likely be less generous than will the assessments of the students themselves. This would account for the positive relationship between assessments and the higher assessments of the students themselves.

Another factor to consider explaining the weak positive relationship between assessments is the volatility of adolescent students on any given day (Duckworth & Yeager, 2014; Kia-Keating, Dowdy, Morgan, & Noam, 2011; Roeser, Eccles, & Sameroff, 2000; Walker, et al., 2017). People have good and bad days; however, students are particularly susceptible to having different factors impact their judgement and reflective ability, especially at one point in time as this assessment was administered. Teacher assessments, as commented above, often draw from a broader range of evidence. Students, by nature of their development, tend to be dominated by the present. Thus, when assessing their social awareness and responsibility they likely will respond differently if they are embroiled in an argument with a friend than if they are planning an outing with those same friends. Things as seemingly mundane as blood-sugar levels impact student self-assessment; thus, getting consistent and reliable self-assessment is a challenge. Teachers are more likely to have had breakfast and a healthy lunch and have controlled reflective skill than are their teenage charges. Teachers also maintain longer term memories of student actions and performances. Thus, teacher assessments would be more consistent with student self-assessments more variable. This does not mean teacher assessments are more accurate, but they are likely more consistent in their assessments of student development. Across the school, it is likely individual anomalies balance somewhat when averaged, thus the assessments are similar to teacher assessments overall, but not consistently.

Finding the assessments of Communication Core Competencies and the Thinking Core Competencies more consistently correlated than the Personal and Social Core Competencies is an indication of two key elements. Communication, collaboration, creative, critical and reflective thinking, have tangible descriptors and are obviously built into curriculum. Personal, social, and cultural identity have fewer tangible descriptors and are more subtly built into

curriculum, often part of larger school-wide, character education type initiatives. Consequently, the relationship between student self-assessments and teacher assessments should be more closely connected for the more tangible non-cognitive skills than for the less tangible skills. There is likely to be much more understanding and common perspectives amongst the more tangible competencies than the more personal and social competencies.

Understanding and explaining why the weak positive relationship between assessments is one thing; however, the real question is whether it matters at all. This study was launched from the perspective that non-cognitive skills need to be systemically assessed to be valued systemically. The premise was that if student self-assessments and teacher assessments are highly correlated, then student self-assessments have value and can be used systemically. This study has shown that the relationship between student and teacher assessments is weak, but does that mean the student self-assessments are not reliable or useful? There is no evidence to support claims that either source of assessment is valid or more accurate than the other, so we certainly cannot discount the reliability of student self-assessments based on this study. Student self-assessment can be very useful.

The Core Competencies were not designed to be teacher assessed as such because teachers embed these skills, aptitudes, and attitudes into their Curricular Competencies, and this is where they are assessed by teachers continuously. Student self-assessment of the Core Competencies is designed to help students develop important skills for learning – metacognition and self-awareness – as well as an understanding and ownership for their development of non-cognitive skills. Students learn more from their own assessments, if done authentically, than they do from teacher assessments. Students are more accountable when they assess themselves than when assessed by a third party and they need to be able to independently assess their

proficiency in an ongoing basis for success in and beyond school. Trying to match teacher scores is antithetical to this.

### ***Research Question 2***

Is this relationship robust to gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, student attendance, student tardiness, or student behaviour?

The relationship between student self-assessments of the Core Competencies and the teacher assessment of student development is robust to different teachers providing the assessments, student grade level, student behaviours, student absenteeism, and student tardiness. Though negatively correlated with teacher assessments, the correlation between student self-assessments and those of their teachers is robust to students having Indigenous ancestry. The relationship is not robust to gender, socio-economic level, or having special education designations. The relationship between the two is correlated far more closely with student fundamental skills development than any other variable used in this study.

This model was based on the thought that a relationship existed between student self-assessments and teacher assessments of the Core Competencies; however, using related variables this study showed that the model is not robust, meaning that other variables are far more predictive of teacher assessments than are student self-assessments, and impact that relationship noticeably.

Teachers generally assess females as having higher levels of development in the Core Competencies than males. Females also assess themselves more developed than do their male counterparts especially in social domains. Meshkat and Nejati (2017) found that there was no significant difference between genders on total measurements of emotional intelligence; however, in several sub-domains such as emotional self-awareness and interpersonal relations,

females scored higher than males. As mentioned above, the main point of reference for students is their peer group and many females, at this age in the classroom setting, appear better at communicating, collaborating, being creative, thinking critically and reflectively, as well as many of the descriptors included in the Personal and Social Core Competencies. Schools acknowledge and reward those proficient in these non-cognitive skills and work to remediate those who are not. Students and teachers observe and understand this. A growing body of research is finding that early in their school lives boys bear the brunt of school discipline and this has a larger negative effect on high school and college completion rates (Owens, 2016). So, when the descriptors are read, those assessing will identify the characteristics more readily in females than males. At the age level of students in this study, females tend to do school better than males do (Grissom & Reyes, 2019; Roeser, Eccles, & Sameroff, 2000). Rarely, in completing the assessments, do people consider examples of development outside the classroom which might allow for a more balanced assessment.

In this study, coming from a lower socio-economic background predicted lower teacher assessments. Perspectives of behaviours are contextual. What lower socio-economic children see at home and amongst their peers is hard to translate into the descriptors that neatly fit a classroom setting; however, the descriptors used are supposed to transcend the classroom. It is hard to translate the deft communication ballet many students with low socio-economic backgrounds must do between what is acceptable and expected at home and what is acceptable and expected in schools: the changing communication methods for different audiences and effect alone, is very complex for students and many are unaware of it. It is highly unlikely that this is recognized when students or teachers assess student development of communication skills

although it is more complex than the adjustments made by those with higher socio-economic backgrounds.

In the classroom, teachers only see the context they are familiar with so might not adjust their assessments to reflect life evidence instead of classroom evidence. Many students with lower socio-economic backgrounds see themselves as skillful in the Core Competencies and they can think of examples that match the descriptors. They think of themselves as good communicators and judge their proficiency by their social interactions. From my 25 years of experience working with adolescents from varied backgrounds, I have learned that school often provides significant cognitive dissonance for students from lower socio-economic backgrounds. Roeser, Eccles, and Sameroff (2000) cite research that indicates conditions “in some families. Schools, and communities do not afford adolescent developmentally appropriate opportunities for academic, social, and emotional growth (p. 446). Teachers see students replicating what they observe and experience in the time they are away from school and compare that to the profile descriptors with upper-middle class lenses (Brophy, 1983; Cate & Glock, 2018; Greenwald & Lai, 2020). The Core Competencies are designed to be life based not classroom based. Consequently, students will likely rate themselves higher than their teachers will; thus, socio-economic level predicts teacher assessments to a greater extent than do the student self-assessments.

People will do well if they can, and rarely understand why they cannot (Dunning, 2011; Greene, 2014). One predictor of lower teacher evaluations is students having a special education designation. Students with such designations have a myriad of challenges, most of which impair their success in communication, working with others, clarity of thought, and interpersonal skills. Students with these challenges often do not see themselves the same way as their teachers do, so



it is not surprising that having a designation is a more accurate predictor of teacher assessments than are student self-assessments (Dunning, 2011; Jansen, Rafferty, & Griffiths, 2018; Yan & Brown, 2017; Yan, Brown, Lee, & Qiu, 2020).

Notwithstanding gender, socio-economic background, or having a special education designation, student fundamental skill proficiency is the most powerful predictor of teacher assessments and when introduced to the regressions for analysis, accounted for the correlation of all three. For this study, fundamental skill proficiency was a measure of student proficiency in reading, writing, and numeracy. In many cases, the higher the fundamental skills proficiency, the more reflective and critical the student will be; however, teachers have a broader perspective, and see the skills the proficient exude and assess them from that perspective. Therefore, it is not surprising that student assessments will not predict teacher assessments as well as the fundamental skill proficiency of those students will.

The more proficient a student's fundamental skill development is, the better able to communicate they are. The more proficient a student's fundamental skill development is, the better able to serve the demands of different roles required for effective collaboration they will be. Teachers will see this and assess student development in these areas accordingly. Duckworth and Yeager (2015) are right that non-cognitive skills require significant cognition. When reading the descriptive profiles for the Core Competencies with this lens, it becomes clear that not having a strong relationship between fundamental skill proficiency and non-cognitive skill development would be impossible. Which begs the question: why assess non-cognitive skills if academic proficiency already provides an accurate measure of development?

Those in education recognize examples where the correlation between non-cognitive skills and academic proficiency do not exist. Students with weak academic skills quite often

have strong social skills and emotional competency. Often, I see students who struggle academically be the first to help peers, form strong relationships, and thrive in contexts not related to school. Many students who struggle with school are successful in other areas and the Core Competencies attempt to address this. This study shows that teacher assessments do not recognize this. The correlation between fundamental skill development and teacher assessment of student development of Core Competencies is a concern as it is insensitive to the strengths of those students anomalous to fundamental skill proficiency. Part of this relationship is also connected to the embedded nature of teaching the Core Competencies: as they are part of the Curricular Competencies teachers teach, one would expect a strong correlation between student academic success and Core Competency development as assessed by teachers.

Of equal concern is the minimal relationship between student self-assessment of non-cognitive skills and their academic proficiency as those with better academic proficiency are better able to articulate their development of non-cognitive skills, while those with lower proficiency levels are not as able to articulate their development. Neither teacher assessment nor student self-assessment provides a reliable or useful measure of student development of Core Competencies beyond the value of the assessment to the individual student through the self-assessment process. The lack of self-assessment training is likely a major factor in the lack of correlations one might expect. The British Columbia Ministry of Education has several publications available that offer suggestions about ways teachers can work with students from Kindergarten to Grade 12 on self-assessing their development in the Core Competencies; however, this is not happening systemically at this point of the curriculum rollout. When I asked students for good examples of ways to assess their development, very few could remember doing such in the past. This is not to say they have not, but they could not recall doing so.

***Research Question 3***

How do gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with student self-assessment of their development in each of the seven Core Competencies?

The only variable to have a correlation greater than  $r = 0.25$  with student self-assessments is teacher assessments of their development. The assessments between the different Core Competencies are moderately correlated, but nothing else is. The most highly correlated Core Competencies are Personal Awareness and Responsibility Core Competency and Social Awareness and Responsibility Core Competency with a correlation of  $r = 0.57$ . Student self-assessments of their development in the Personal Awareness and Responsibility Core Competency is similarly correlated to their assessment of development of collaboration skills.

The lack of meaningful correlation of any variable to student self-assessments could be indicative of many factors, all of which demonstrate the need for student self-assessment of Core Competencies and direction for improved practice. The most obvious explanation for the lack of correlation is the diverse and challenged understanding by students of the language used and the implications of the descriptors. The descriptors are necessarily general in nature, allowing for much interpretation and personalization; however, with limited experiences to draw from, students struggle to fully comprehend the breadth of meaning. As a 13-year-old, what are the points of reference one would use to define and understand “I can advocate and take action for my communities and the natural world. I expect to make a difference.”? This underscores the beauty and the challenge of using a single continuum for students from kindergarten through graduation. That descriptive statement, taken from Profile Five of the Social Awareness and Responsibility Core Competency, can be personalized and will evolve as students develop, but

likely will be used to define their development periodically through their K-12 journey.

However, to expect student self-assessment to be reliable undermines the value of a process that invites reflection and ownership. The more examples and situations a student can draw from, the more powerful their self-assessment will be (Yan & Brown, 2017).

The lack of correlation of variables to student self-assessments also speaks to the developmental level of the students in this study. Early adolescence is a tumultuous time with highly unpredictable influences. Development in all areas is asynchronous which also speaks to the value of using a consistent continuum of development. By working with the six profiles in each of the seven Core Competency from kindergarten through graduation throughout the school year, students are provided a consistent barometer to inform their development despite the vagaries experienced throughout their K-12 journey. However, it also underscores the importance of not using the assessments beyond informing students, and their support team, of current student reflection in the various domains.

Another explanation for the lack of correlation between the variables and student self-assessments is the power of inclusive pedagogy. One would naturally expect to see a correlation between having a special education designation and student self-assessments, as is seen in the teacher assessments; however, none exists. One would naturally expect to see a correlation between coming from a lower socio-economic background predictive of student self-assessments; however, none exists (Gould, 1996; Rothstein, 2006). Even lack of attendance, tardiness, and negative behaviour records are not correlated with student self-assessments. By having all students, in classes, working at their individual level with supports, removes the predictive nature of traditional influences. For students' assessments, even academic proficiency is not meaningfully correlated with student self-assessments. Based on earlier comments

connecting non-cognitive skill development with cognitive skill proficiency, this might be problematic; however, the inclusive classroom seems to mitigate for this, removing prejudice from the assessments. Levels of self-awareness are factors for student self-assessment and are very important for learning and success beyond school (Zlotnik & Toglia, 2018).

As mentioned above, asynchronous development impacts the linear consistency of student self-assessments; however, the process of self-assessment helps develop self-awareness (Pandro, Jonsson & Botella, 2017). By comparing themselves to their peers, which they do naturally, guided by descriptive profiles, students become more self-aware and as they mature gaining more experiences, their accuracy and depth of understanding will improve. Using this self-assessment process helps their sense of self evolve by challenging it in a way that external assessment cannot. Student self-reporting is a valuable tool to help inform students and to support their growth and development (Andrade, 2019; Duckworth, 2019; Ross, 2006). Duckworth (2019) says that understanding one's developmental level of non-cognitive skills helps guide one's growth. In the same article she explains the challenge that not having useful measurements presents to understanding. The descriptive profiles used in this study helps mitigate for that. Even "asking the questions may in some cases be as important as the measurement outcome, as the respondents see the desirable response whether they answer truthfully or not" (Frydenberg, Liang, & Muller, 2017, p. 75). The lack of correlation to other variables should not be a caution, or a challenge to value, rather it should be seen as a strength of the process.

Another reason for the lack of correlation between measured variables in this study and student self-assessment is the limited development of metacognitive skills. Like self-awareness, metacognition is key for learning and growth. Metacognitive skills (planning, monitoring, and

evaluating) interact with student motivation (beliefs, goals, and dispositions) to drive learning and growth (Zepeda, Richey, Ronevich, & Nokes-Malach, 2015). Students develop these skills and understandings over time and through experiences. These continue to develop throughout one's life, and given the right conditions, facilitate knowledge transfer and preparation for future learning. The students in this study demonstrated the asynchronous nature of this development through the lack of correlations to their self-assessments. However, as with self-awareness above, the process of consistently using the self-assessment methodology, guided by descriptive profiles, will improve a student's metacognitive skills allowing them to acquire both procedural and declarative knowledge (Zepeda, Richey, Ronevich, & Nokes-Malach, 2015).

Another correlation of note was the moderate correlation between student self-assessments across Core Competencies. Unlike teacher assessments which were strongly correlated across Core Competencies, as will be discussed below, student self-assessments were not. It makes sense that there would be some correlation across Core Competencies as good personal and social awareness will likely translate to good communication and collaboration skills; however, if the correlation is too high one must wonder if students understand the differences between competencies. They are discrete aptitudes and attitudes, and effective self-assessment will recognize this. The findings of this study support the differences of student self-assessments between the different Core Competencies. This could be an indicator that the students are able to differentiate the Core Competencies better than their teachers can.

#### ***Research Question 4***

How do student gender, ethnicity, socio-economic level, foundation skill proficiency, grade level, attendance, tardiness, or behaviour correlate with teacher assessments of student development in each of the seven Core Competencies?

The correlations between student socio-economic level ( $r = 0.37$ ) and teacher assessments, and the relationship between a special education designation ( $r = -0.38$ ) are moderately correlated; however, they are both overshadowed by the 0.69 correlation between student proficiency of fundamental skills and teacher assessments of student development of the Core Competencies. When the regressions were run, most of the covariance of socio-economic level and special education designations was picked up in the fundamental skill development variable.

Teacher assessments between Core Competencies were highly correlated. The strongest correlation was between teacher assessments of student development of the Personal Awareness and Responsibility Core Competency and the Social Awareness and Responsibility Core Competency ( $r = 0.82$ ). This was followed by the correlation between their assessments of the Personal Awareness and Responsibility Core Competency and their development of the Collaboration Core Competency with a 0.78 correlation. Of note, British Columbia has divided the seven Core Competencies into three related areas: Communication, Thinking, and Personal and Social. Fundamental skill proficiency levels are correlated more strongly with teacher assessments of student development of the Thinking Competencies and the Communication Competencies and are least correlated in the Personal and Social Competencies.

Ironically, this study provided more questions about the value of teacher assessments of student development of Core Competencies than it did about student self-assessments. While the high correlation of fundamental skill proficiency and development of Core Competencies can be explained by the significant cognition required for effective non-cognitive skill development, it begs the question of teacher ability to separate in-class learning from Core Competency development. The alignment can also be explained by the integration of Core Competency

instruction into all Curricular Competencies. However, does this create an echo-chamber that prevents teachers from accurately assessing student development of the individual Core Competencies? Teachers see their classrooms through their lenses and assess students accordingly, ignorant of evidence away from the class environment and structure. The results of this study might imply that teachers cannot see past those who “do school”; however, the lack of correlation of other variables undermines that interpretation. Factors such as attendance rates, tardiness, and discipline records would have shown up as correlated with teacher assessments if teacher bias toward those who “do school” was present, and they did not.

The very high correlation between fundamental skill proficiency and teacher assessments in the Communication and Thinking Core Competencies, as compared to the Personal and Social Core Competencies demonstrates the propensity of teachers to integrate different elements of the Core Competencies into their lessons. Communication and collaboration skills have been hallmarks of classrooms for decades. More recently, attention to creative, critical, and reflective thinking have been recognized and targeted. The evolution of social-emotional learning is a relatively recent phenomenon. The relatively lower correlation of fundamental skill development with Personal and Social Core Competencies is indicative of the lagging presence of these skills in curricular instruction. If teachers were integrating social-emotional learning into their curriculum like they do communication and collaboration skill development, one would expect to see a higher correlation between fundamental skill development and Personal and Social Core Competencies.

Another explanation for this lower correlation might be in the breadth of the descriptive profiles. The descriptions for Communication Core Competencies and Thinking Core Competencies are more finite and school focused than are those in the Personal and Social Core



Competencies. It is easier for teachers to see and find examples for the more finite descriptors in their classes than the more esoteric descriptors that require deeper, more personal knowledge of their students.

This study has shown that teacher assessment of student development of the Core Competencies is redundant with their curricular assessments and very, very minimally reflective of student self-assessments. Though a valuable measure in this study to assist in understanding the value of student self-assessment of Core Competencies and some of the challenges to that assessment, teacher assessments of student development of Core Competency skills, attitudes, and aptitudes are not helpful, useful, or relevant and should not be used as a measure for student development in these areas. This study has shown that student self-assessment of their development of non-cognitive skills is valuable and important to their growth and development and should not be collected to validate non-cognitive skills systemically.

### **Implications for Practice**

This study set out to understand the utility of student self-assessments of non-cognitive skills by using a middle school sample in British Columbia. Connected to this overarching goal was to understand how student self-assessments of the Core Competencies being used in British Columbia can inform systemic policy and decision making as development of all students in these seven areas is one of the five recognized educational outcomes of British Columbia's education system ("Enhancing Student Learning Reporting Order", 2020). Currently, the only measure of this educational outcome is the "[N]umber and percentage of students transitioning to Canadian post-secondary institutions within 1 and 3 years". This study found that student self-assessments are positively correlated with teacher assessments of the same non-cognitive skills, but only minimally. This study found that a far stronger predictor of student development in

non-cognitive skills was their academic proficiency level. This study also found that student academic proficiency levels had a minimal relationship to their self-assessment of non-cognitive skills. From these findings are several key implications for practice.

Self-assessment is a valuable tool for improving self-regulated learning and self-efficacy (Pandero, Jonsson & Botella, 2017); however, it poses many challenges for summative assessment (Brown, Andrade, & Chen, 2015; Brown & Harris, 2013; Gehbach & Hough, 2018). The two uses of self-assessment should be kept separate; however, they necessarily inform each other. The anchored profiles provided from the Ministry of Education provide students with a valuable guide for development of these non-cognitive skills; however, they need to be presented and used in a way that is age and development appropriate. Classroom teachers are skilled in this area and the work with the profiles is useful for their work and planning, as well as the value it offers their students. These tools could be easily converted for communication with parents, especially by having the students able to articulate where their current development is and how they plan to progress. The challenge becomes, how to increase the utility of self-assessment for use in broader communities. Measuring how many students go on to post-secondary education within one and three years is not a useful measure.

Considering the minimal correlation of student self-assessment and foundational academic skills and the high correlation of those skills and teacher assessments, more work needs to be done on the accessibility of the anchoring profiles for students. Not only is there a weak correlation, but student self-assessments are minimally correlated to any variable and often show high standard deviations and standard error levels. There are several factors that could be at play here, but the most likely cause is the lack of consistent and on-going use of the descriptive profiles and the language used in them. For example, even though they are well

instructed in different modes of communication, and practice changing communication for different audiences and purposes, few students could identify different forms of communication, or that they adjust in their communication for different purposes and with different audiences, without significant prompting.

The focus should be on developing the skills, knowledge, and understanding required for effective self-assessment throughout a student's schooling. This begins by making sure that the language used in descriptive profiles is clearly understood and relevant to each student. Some of the ways this can be done is through discussions, the provision of examples for students, and the collecting of examples by students. Broadening student experiences and applying those experiences to the Core Competencies will deepen student understanding and could push applications beyond the classroom. Using student reflections, with feedback, and encouraging connections to the Core Competencies from a myriad of sources will help develop the skills, knowledge, and understanding required for students to assess their ongoing development of non-cognitive skills more accurately and meaningfully.

Recognizing that student academic proficiency is the most significant predictor of teacher assessment of student development of non-cognitive skills has implications not only for assessing non-cognitive skills, but also for developing these skills. It could be argued that improving fundamental student skills will improve their development of non-cognitive skills, but that would be confusing correlation with causation; this study invites further research into this notion. This study found a strong correlation between student academic proficiency and teacher assessments when other variables were controlled for but found only a minimal correlation to student self-assessments. This finding should point practitioners to finding ways to improve student ability to accurately self-assess. Because academic proficiency levels were only

minimally correlated with student self-assessment of non-cognitive skills, it means students might not have a very realistic view of their own development and working with the descriptive profiles in a meaningful and on-going way will address this deficiency.

By being aware of these challenges, we can accept that the student self-assessments done this way are not reliable, so we need to be clear about what the purpose of the assessment tools are. If the purpose is for systemic assessment, student self-assessment is the wrong tool. If the purpose is, as the Ministry of Education claims, to promote “personalization, inclusion, diversity, and student ownership of learning” then the results need to be contextualized and assessments collected differently. The goal should not be to provide accurate and reliable assessments for external use; rather, the goal should be to help students engage in effective self-assessment by developing reflective language, metacognition, and self-awareness. The teacher’s role should be to facilitate, encourage, and support students developing these skills through the Core Competencies and if there is a gap in perspectives of student development, then a starting point for meaningful discussion and learning has been provided. It is important to approach this, not from a “right and wrong” approach, but from a learner’s stance.

If, however, systemic data are necessary, there are other mechanisms that can be used to collect them. Ultimately, the application of the self-assessment learning journey culminates in the capstone students complete as part of their Career Education program and graduation requirements (“Developing and Supporting K-12 Student Reflection and Self-Assessment of Core Competencies”, p. 4). As part of the Capstone Project, students are expected to reflect on “their growth as a learner by reviewing their collected demonstrations of learning and reflections about their growth in Core Competency development across the years” (“Career Education 10 – 12 Guide”, p. 16). Students are to support their self-assessment with relevant demonstrations

and articulate their thinking as part of their graduation requirements. These assessments could be collected and enumerated for systemic assessment.

Another source of data comes from student completion of the graduation program. Throughout the K-12 curricula, teachers have many opportunities to comment on and assess Core Competencies as they are embedded in the learning. By nature of their intended purpose, the creation of “the Educated Citizen”, the successful completion of high school could be used as another systemic measure of student development of the Core Competencies.

However, to truly assess the success of the K-12 system in achieving its fundamental goal other measures should be explored, such as student “success” three, five, ten, and fifteen years after graduation. Success would need to be defined, but there are many easy measures that can be used such as criminal record, social support required, employment record, to provide this “success” index. This would give the taxpayer and Ministry of Education a good measurement of how successful the redesigned curriculum is at developing Core Competencies.

If systemic measures are required for tracking development throughout the K-12 system, mechanisms already exist beyond teacher assessments. Currently all students in British Columbia in grades four, seven, and ten participate in a Student Learning Survey that asks numerous carefully constructed questions about their experiences in schools, about their lives, and about their development. Using the existing profiles as guides, two or three questions for each of the Core Competencies could be included in this survey of students to provide schools, school districts, and the Ministry of Education with data to support policy and decision making connected to these non-cognitive skills. This would be an efficient and effective way to get a snapshot of student development.

This study was designed to validate student self-assessment of non-cognitive skills for systemic evaluation. Instead, it demonstrated why the assessment plan established in British Columbia for non-cognitive skill development is appropriate and important. Mechanisms do exist, or could easily exist, for systemic evaluation, but student self-assessment is not an appropriate tool.

### **Study Limitations and Future Research**

There are several key limitations to this study. The most significant limitations are the age of the students. Students in grades six through nine are in early adolescence, a time of storm and stress for the teenage brain. This increases the variability of responses and reactions to external and internal stimuli which could impact the accuracy of self-assessments on any given day. It is also a time of asynchronous development which could have a bearing on the accuracy of teacher assessments when considered in context with peers.

One of the limitations considered during this study was the level of language used in the descriptive profiles for each of the Core Competencies. This potential liability was mitigated somewhat by how the questionnaires were administered. By having the researcher read each profile, while students read along if they wanted to, and answer any questions, the researcher was able to support understanding for those with lower literacy levels. Considering academic proficiency is minimally correlated with student self-assessments it is unlikely that the level of language used in the descriptions was much of a factor.

Another limitation of the study is the lack of accurate representation the sample presents for the broader community. While most sub-sets were reflective of the broader community, two were noticeably not. A high percentage (51%) of students in this study have low socio-economic profiles. Socio-economic level was very minimally correlated to assessed development;

however, it had more impact in the Core Competencies associated with social emotional learning. Another possible limitation of this study is the high percentage of Indigenous students in the sample, 31%, and the lack of ethnic diversity of other groups. This is not a common experience in many other educational jurisdictions, so needs to be considered when using the results of this study.

This study highlights some interesting areas for future research. The strong correlation between student academic development and teacher assessments of their development of non-cognitive skills leaves many questions unanswered. Future research should look at different elements of this relationship. An easy assumption would be to explain this correlation with teacher bias; however, teacher differences were controlled for in this study as was a traditionally more accurate source of teacher bias, student behaviour. To allow that, as Duckworth and Yeager (2015) present, that non-cognitive skills are dependent on cognitive abilities is one explanation for this relationship but what are the implications of this for education and the preparation of citizens? It is dangerous to assume causality in this relationship, as higher academic skills do not necessarily beget higher non-cognitive skills but exploring this relationship could prove fruitful.

One of the shortcomings of this study leads to a potentially useful area for future research. This study used means and aggregates to explore correlations; however, it did not address the students on the periphery, those students whose self-assessments were dramatically different to those of their teachers. Appendix D presents these comparisons. Using data in this study, Table 5.1 presents a comparison of student and teacher assessments of student development of the same Core Competencies. To arrive at these numbers the study subtracted student self-assessments from the assessments provided by their two teachers (averaged). As the table below shows, only two Core Competencies had a median different than 0.0 which would

represent a high correlation between assessments across the whole sample. However, the mean scores are skewed toward higher student self-assessments. From this one can deduce that while the number of students either side of the median is the same, students are far more inclined to exaggerate their development in their favour than the other way around. This table also shows the standard deviation of each Core Competency and demonstrates that compared to other Core Competencies, students underestimate their communication skills and development of personal awareness and responsibility and grossly overestimate their development of creative thinking skills.

**Table 5.1**

*Proximity of Individual Paired Assessments of Core Competencies*

Core Competency	Median	Mean	Standard Deviation	Within 1 Profile
Communication	0.0	-0.1605	1.3015	69.12%
Collaboration	0.0	-0.2809	1.2460	68.21%
Creative Thinking	-0.5	-0.5170	1.5076	58.03%
Critical and Reflective Thinking	0.0	-0.2978	1.2822	66.36%
Personal Awareness and Responsibility	0.0	-0.1698	1.4549	61.11%
Positive Personal and Cultural Identity	-0.5	-0.2912	1.5010	62.33%
Social Awareness and Responsibility	0.0	-0.3673	1.4897	59.47%
Total		-0.2978	0.1124	

From this, two future areas of study could prove valuable. What are the profiles of the outliers, i.e., those students with self-assessments vastly different than their teachers? What is it about creative thinking that causes students to over report their development? The examination of anomalies of significant difference in assessments levels could provide insight into some of the challenges to self-assessment for specific student profiles and/or domains.



## **Conclusion**

This research study explored the relationship between student self-assessment of non-cognitive skills and the assessments of development of those same skills by their teachers. Using data collected in March of 2021 from students in grades six through nine at a small middle school in British Columbia, results reveal that student self-assessments are positively correlated to the assessments provided by their teachers but there is minimal correlation, with student self-assessments being higher than those of their teachers. This relationship proved to be robust to teacher differences, student development, and to student behaviours, however, it was not robust to student academic proficiency. Few things were found to correlate with student self-assessments; however, student academic proficiency is highly correlated to teacher assessments of student non-cognitive skills. Student self-assessments showed more differentiation between the different Core Competencies and were less predictable than the assessments by their teachers. Student self-assessments can provide great learning opportunities for students and might hold the key to getting them to own their education, while teacher assessment of student development is far more homogenous making it redundant and less useful. Future research should explore the relationship between student academic proficiency and their development of non-cognitive skills to help better understand how to improve the viridity of student self-assessment of non-cognitive skills which will also help them improve their development of these skills.

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**Appendix A**

**Core Competency Accuracy and Reliability Study – Student Questionnaire**

The purpose of this study is to identify how accurately students can assess their development of the Core Competencies. All responses will be kept confidential with the researchers and will only be reported as statistics with no ability for readers to identify individuals or groups. All names will be converted to randomly assigned numbers but are necessary to match responses to those of your teachers.

Please complete this questionnaire as accurately as possible.

Your Name: \_\_\_\_\_

Your Grade: \_\_\_\_\_ Your Homeroom number: \_\_\_\_\_

With respect to gender, how do you most often identify:      Female      Male      Other

How do you rate your development in the following Core Competencies?

<b>Core Competency</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	<b>P5</b>	<b>P6</b>
Communicating						
Collaborating						
Creative Thinking						
Critical and Reflective Thinking						
Personal Awareness & Responsibility						
Positive Personal & Cultural Identity						
Social Awareness & Responsibility						



### Appendix C

Source: “BC’s New Curriculum Core Competencies”, n.d.

## Core Competency – Communicating

Communicating encompasses the set of abilities that people use to impart and exchange information, experiences, and ideas; to explore the world around them; and to understand and effectively use communication forms, strategies, and technologies. Communicating provides a bridge between peoples’ learning, their personal and social identity, and the world in which they interact.

People who communicate effectively use their skills and strategies intentionally to ensure understanding their audience. They communicate in an increasing variety of contexts, for a variety of purposes, and often with multiple audiences.

PROFILE	DESCRIPTION
PROFILE ONE	<p><b>In a safe and supported environment, I respond meaningfully to communication from peers and adults.</b></p> <p><b>In familiar settings, I communicate with peers and adults.</b></p>
PROFILE TWO	<p>I talk and listen to people I know. I can communicate for a purpose. I can understand and share basic information about topics that are important to me, and answer simple, direct questions about my activities and experiences.</p>
PROFILE THREE	<p><b>I communicate purposefully, using forms and strategies I have practiced.</b></p> <p>I participate in conversations for a variety of purposes (e.g., to connect, help, be friendly, learn and share). I listen and respond to others. I can consider my purpose when I am choosing a form and content. I can communicate clearly about topics I know and understand well, using forms and strategies I have practiced. I gather the basic information I need and present it.</p> <p><b>I communicate clearly and purposefully, using a variety of forms appropriately.</b></p>
PROFILE FOUR	<p>I share my ideas and try to connect them with others’ ideas. I am an active listener – I make connections and ask clarifying and extending questions when appropriate. I can plan ways to make my message clear and engaging for my audience and create communications that focus on a variety of purposes and audiences. I acquire the information I need for specific tasks and for my own interests and present it clearly.</p>

PROFILE FIVE

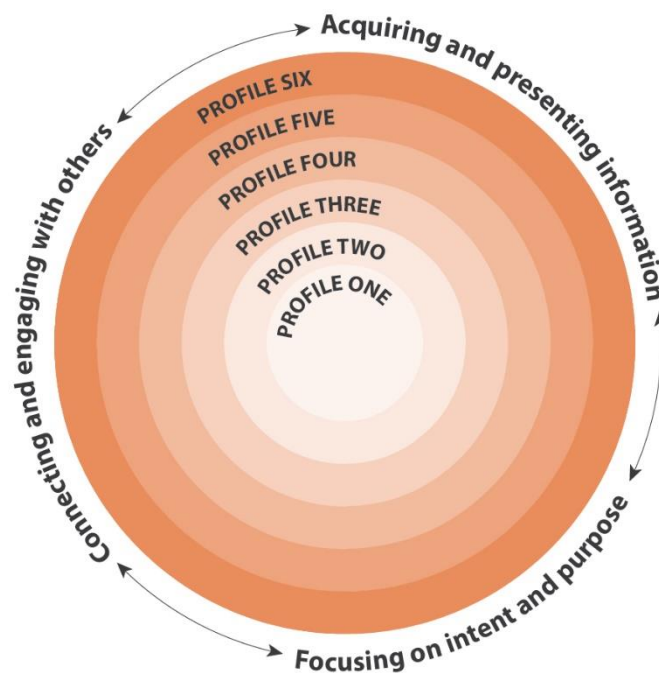
**I communicate confidently, using forms and strategies that show attention to my audience and purpose.**

In discussions and conversations, I am focused and help to build and extend understanding. I am an engaged listener; I ask thought-provoking questions when appropriate and integrate new information. I can create a wide range of effective communications that feature powerful images and words, and I identify ways to change my communications to make them effective for different audiences. I use my understanding of the role and impact of story to engage my audiences in making meaning. I acquire information about complex and specialized topics from various sources, synthesize it, and present it with thoughtful analysis.

PROFILE SIX

**I communicate with intentional impact, in well-constructed forms that are effective in terms of my audience and in relation to my purpose.**

I contribute purposefully to discussions and conversations. I synthesize, deepen, and transform my own and others' thinking. I can weave multiple messages into my communications; I understand that my audience will use their own knowledge and experiences in making meaning. I show understanding and control of the forms and technologies I use; I can assess audience response and draw on a repertoire of strategies to increase my intended impact. I can acquire, critically analyze, and integrate well-chosen information from a range of sources.



## Core Competency – Collaborating

Collaborating involves the skills, strategies, and dispositions that people use to work together to pursue common purposes and accomplish common goals.

People who collaborate effectively recognize how combining others' perspectives, strategies, and efforts with their own enhances collective understanding, use, and impact. They value the contributions of group members, interact supportively and effectively using inclusive practices, and strive for shared commitment and mutual benefit.

PROFILE	DESCRIPTION
PROFILE ONE	<p><b>In familiar situations, I can participate with others.</b></p> <p><b>In familiar situations, I cooperate with others for specific purposes.</b></p>
PROFILE TWO	<p>I contribute during group activities, cooperate with others, and listen respectfully to their ideas. I can work with others for a specific purpose.</p>
PROFILE THREE	<p><b>I contribute during group activities with peers and share roles and responsibilities to achieve goals.</b></p> <p>I take on different roles and tasks in the group and work respectfully and safely in our shared space. I express my ideas and help others feel comfortable to share theirs so that all voices are included. I work with others to achieve a common goal and can evaluate our group processes and results.</p> <p><b>I can confidently interact and build relationships with other group members to further shared goals.</b></p>
PROFILE FOUR	<p>I can identify and apply roles and strategies to facilitate groupwork. I draw on past experiences to negotiate and develop group processes. I am an active listener and speaker. I share my ideas and try to connect them with others' ideas, I ask clarifying questions and check for understanding when appropriate, and I test my ideas with others and consider their input. I help resolve conflicts and challenges as they arise. I recognize how my contributions and those of others complement each other. I can plan with others and adjust our plan according to the group's purpose.</p>



**I can facilitate group processes and encourage collective responsibility for our progress.**

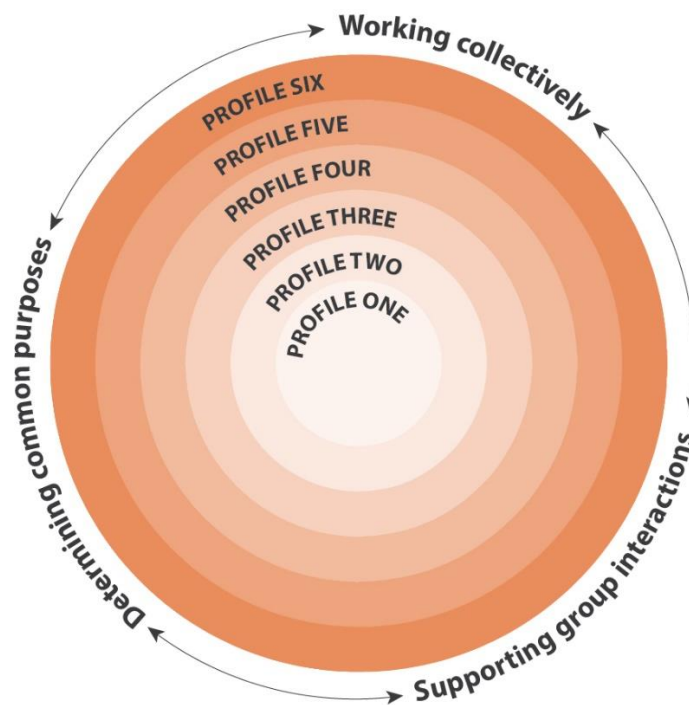
**PROFILE FIVE**

I play a role in collectively monitoring the progress of the group and adjust my contributions as needed. I recognize the interdependence of our roles and draw on these to move us forward. I ask thought-provoking questions, integrate new information and various perspectives from others, and think critically about whose voices are missing. I can disagree respectfully, and I anticipate potential conflicts and help manage them when they arise. I give, receive, and act on constructive feedback in support of our goals, and I can evaluate and revise plans with other group members.

**I can connect my group with other groups and broader networks for various purposes.**

**PROFILE SIX**

I can step outside of my comfort zone to develop working relationships with unfamiliar groups. I develop and coordinate networking partnerships beyond and in service of the group. I demonstrate my commitment to the group’s purpose by taking on different roles as needed. I acknowledge different perspectives and seek out and create space for missing or marginalized voices. I summarize key themes to identify commonalities and focus on deepening or transforming our collective thinking and actions. I recognize when wisdom and strategies from others are needed and access these to address complex goals. I help create connections with other groups or networks to further our common goals and our impact.



## Core Competency – Creative Thinking

Creative Thinking involves the generation of ideas and concepts that are novel and innovative in the context in which they are generated, reflection on their value to the individual or others, and the development of chosen ideas and concepts from thought to reality.

People who think creatively are curious and open-minded, have a sense of wonder and joy in learning, demonstrate a willingness to think divergently, and are comfortable with complexity. A creative thinker reflects on existing ideas and concepts; uses imagination, inventiveness, resourcefulness, and flexibility; and is willing to take risks to go beyond existing knowledge.

PROFILE	DESCRIPTION
PROFILE ONE	<p><b>I get ideas when I play.</b></p> <p>I get ideas when I use my senses to explore. My play ideas are fun for me and make me happy. I make my ideas work or I change what I am doing.</p>
PROFILE TWO	<p><b>I can get new ideas or build on or combine other people's ideas to create new things within the constraints of a form, a problem, or materials.</b></p> <p>I can get new ideas to create new things or solve straightforward problems. My ideas are fun, entertaining, or useful to me and my peers, and I have a sense of accomplishment. I can use my imagination to get new ideas of my own, or build on other's ideas, or combine other people's ideas in new ways. I can usually make my ideas work within the constraints of a given form, problem, or materials if I keep playing with them.</p>
PROFILE THREE	<p><b>I can get new ideas in areas in which I have an interest and build my skills to make them work.</b></p> <p>I generate new ideas as I pursue my interests. I deliberately learn a lot about something by doing research, talking to others, or practicing, so that I can generate new ideas about it; the ideas often seem to just pop into my head. I build the skills I need to make my ideas work, and I usually succeed, even if it takes a few tries.</p>

**I can get new ideas or reinterpret others' ideas in novel ways.**

PROFILE  
FOUR

I get ideas that are new to my peers. My creative ideas are often a form of self-expression for me. I have deliberate strategies for quieting my conscious mind (e.g., walking away for a while, doing something relaxing, being deliberately playful), so that I can be more creative. I use my experiences with various steps and attempts to direct my future work.

**I can think “outside the box” to get innovative ideas and persevere to develop them.**

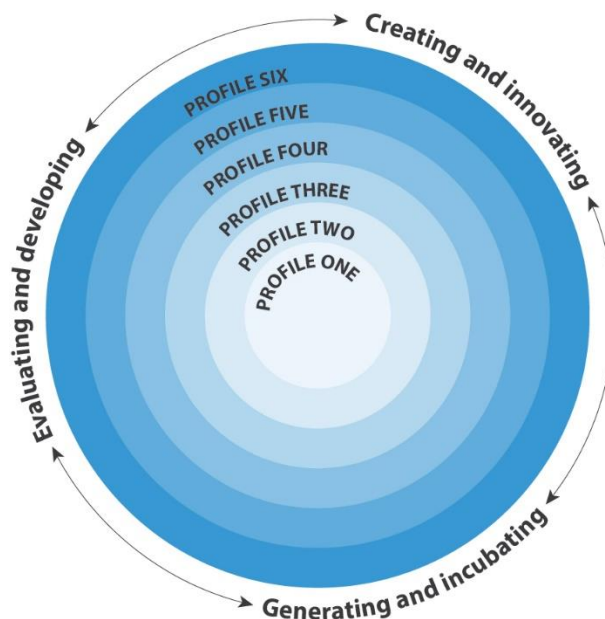
PROFILE  
FIVE

I can get new ideas that are innovative, may not have been seen before, and have an impact on my peers or in my community. I have interests and passions that I pursue over time. I look for new perspectives, new problems, or new approaches. I am willing to take significant risks in my thinking in order to generate lots of ideas. I am willing to accept ambiguity, setbacks, and failure, and I use them to advance the development of my ideas.

**I can develop a body of creative work over time in an area of interest or passion.**

PROFILE  
SIX

I can get ideas that are ground-breaking or disruptive and can develop them to form a body of work over time that has an impact in my community or beyond. I challenge assumptions as a matter of course and have deliberate strategies (e.g., free writing or sketching, meditation, thinking in metaphors and analogies) for getting new ideas intuitively. I have a strong commitment to a personal aesthetic and values, and the inner motivation to persevere over years if necessary, to develop my ideas.



## Core Competency – Critical & Reflective Thinking

Critical and Reflective Thinking encompasses a set of abilities that students use to examine their own thinking and that of others. This involves making judgments based on reasoning, where students consider options, analyze options using specific criteria, and draw conclusions.

People who think critically and reflectively are analytical and investigative, willing to question and challenge their own thoughts, ideas, and assumptions and challenge those of others. They reflect on the information they receive through observation, experience, and other forms of communication to solve problems, design products, understand events, and address issues. A critical thinker uses their ideas, experiences, and reflections to set goals, make judgments, and refine their thinking.

PROFILE	DESCRIPTION
PROFILE ONE	<p><b>I can explore.</b></p> <p>I can explore materials and actions. I can show whether I like something or not.</p>
PROFILE TWO	<p><b>I can use evidence to make simple judgments.</b></p> <p>I can ask questions, make predictions, and use my senses to gather information. I can explore with a purpose in mind and use what I learn. I can tell or show others something about my thinking. I can contribute to and use simple criteria. I can find some evidence and make judgments. I can reflect on my work and experiences and tell others about something I learned.</p>
PROFILE THREE	<p><b>I can ask questions and consider options. I can use my observations, experience, and imagination to draw conclusions and make judgments.</b></p> <p>I can ask open-ended questions, explore, and gather information. I experiment purposefully to develop options. I can contribute to and use criteria. I use observation, experience, and imagination to draw conclusions, make judgments, and ask new questions. I can describe my thinking and how it is changing. I can establish goals individually and with others. I can connect my learning with my experiences, efforts, and goals. I give and receive constructive feedback.</p>

**I can gather and combine new evidence with what I already know to develop reasoned conclusions, judgments, or plans.**

PROFILE  
FOUR

I can use what I know and observe to identify problems and ask questions. I explore and engage with materials and sources. I can develop or adapt criteria, check information, assess my thinking, and develop reasoned conclusions, judgments, or plans. I consider more than one way to proceed and make choices based on my reasoning and what I am trying to do. I can assess my own efforts and experiences and identify new goals. I give, receive, and act on constructive feedback.

**I can evaluate and use well-chosen evidence to develop interpretations; identify alternatives, perspectives, and implications; and make judgments. I can examine and adjust my thinking.**

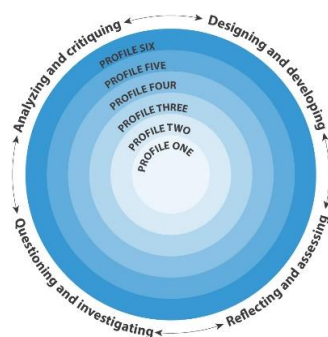
PROFILE  
FIVE

I can ask questions and offer judgments, conclusions, and interpretations supported by evidence I or others have gathered. I am flexible and open-minded; I can explain more than one perspective and consider implications. I can gather, select, evaluate, and synthesize information. I consider alternative approaches and make strategic choices. I take risks and recognize that I may not be immediately successful. I examine my thinking, seek feedback, reassess my work, and adjust. I represent my learning and my goals and connect these with my previous experiences. I accept constructive feedback and use it to move forward.

**I can examine evidence from various perspectives to analyze and make well-supported judgments about and interpretations of complex issues.**

PROFILE  
SIX

I can determine my own framework and criteria for tasks that involve critical thinking. I can compile evidence and draw reasoned conclusions. I consider perspectives that do not fit with my understandings. I am open-minded and patient, taking the time to explore, discover, and understand. I make choices that will help me create my intended impact on an audience or situation. I can place my work and that of others in a broader context. I can connect the results of my inquiries and analyses with action. I can articulate a keen awareness of my strengths, my aspirations and how my experiences and contexts affect my frameworks and criteria. I can offer detailed analysis, using specific terminology, of my progress, work, and goals.



## Core Competency – Personal Awareness & Responsibility

Personal Awareness and Responsibility involves understanding the connections between personal and social behaviour and well-being; it encourages people to make constructive and ethical decisions and act on them.

People who are personally aware and responsible demonstrate self-respect, persevere in difficult situations, and exercise responsibility. They understand that there are consequences for their decisions and actions. A personally aware and responsible individual takes steps to ensure their well-being, sets goals and monitors progress, regulates emotions and manages stress, and recognizes and advocates for their own rights.

PROFILE	DESCRIPTION
PROFILE ONE	<p><b>I can show a sense of accomplishment and joy, and express some wants, needs, and preferences. I can sometimes recognize my emotions.</b></p> <p><b>I can initiate actions that bring me joy and satisfaction and recognize that I play a role in my well-being.</b></p>
PROFILE TWO	<p>I can seek out experiences that make me feel happy and proud. I can express my wants and needs and celebrate my efforts and accomplishments. I have some strategies that help me recognize and manage my feelings and emotions. I recognize and can explain my role in learning activities and explorations, and I can give some evidence of my learning. I can describe how some specific choices can affect my well-being and participate in activities that support my well-being.</p>
PROFILE THREE	<p><b>I can make choices that help me meet my wants and needs and increase my feelings of well-being. I take responsibility for my actions.</b></p> <p>I can take action toward meeting my own wants and needs and finding joy and satisfaction, and work toward a goal or solving a problem. I can use strategies that increase my feeling of well-being and help me manage my feelings and emotions. I can connect my actions with both positive and negative consequences and try to make adjustments; I accept feedback. I make decisions about my activities and take some responsibility for my physical and emotional well-being.</p>

**I can recognize my strengths and take responsibility for using strategies to focus, manage stress, and accomplish my goals.**

PROFILE  
FOUR

I advocate for myself and my ideas; I accept myself. I am willing to engage with ideas or information that is challenging for me. I can be focused and determined. I can set realistic goals, use strategies to accomplish them, and persevere with challenging tasks. I can tell when I am becoming angry, upset, or frustrated, and I have strategies to calm myself. I can make choices that benefit my well-being and keep me safe in the communities I belong to.

**I recognize my value and advocate for my rights. I take responsibility for my choices, my actions, and my achievements.**

PROFILE  
FIVE

I have valuable ideas to share. I am willing to explore controversial issues, and I can imagine and work toward change in myself and in the world. I can set priorities; implement, monitor, and adjust a plan; and assess the results. I take responsibility for my learning, seeking help as I need it. I use strategies for working toward a healthy and balanced lifestyle, for dealing with emotional challenges, and for finding peace in stressful times. I know how to find the social support I need.

**I can identify my strengths and limits, find internal motivation, and act on opportunities for self-growth. I take responsibility for making ethical decisions.**

PROFILE  
SIX

I am aware of my personal journey and reflect on my experiences as a way of enhancing my well-being and dealing with challenges. I can advocate for myself in stressful situations. I can take the initiative to inform myself about controversial issues and take ethical positions. I take ownership of my goals, learning, and behaviour. I act on what is best, over time, in terms of my goals and aspirations. I recognize the implications of my choices and consult with others who may be affected by my decisions. I can identify my potential as a leader in the communities I belong to. I sustain a healthy and balanced lifestyle.



## Core Competency – Positive Personal & Cultural Identity

Positive Personal and Cultural Identity involves the awareness, understanding, and appreciation of the factors that contribute to a healthy sense of oneself; it includes knowledge of one’s family background, heritage(s), language(s), beliefs, and perspectives in a pluralistic society.

People who have a positive personal and cultural identity value their personal and cultural narratives and understand how these shape their identity. They exhibit a sense of self-worth, self-awareness, and positive identity to become confident individuals who take satisfaction in who they are and what they can do. They contribute to their own well-being and to the well-being of their family, community, and society.

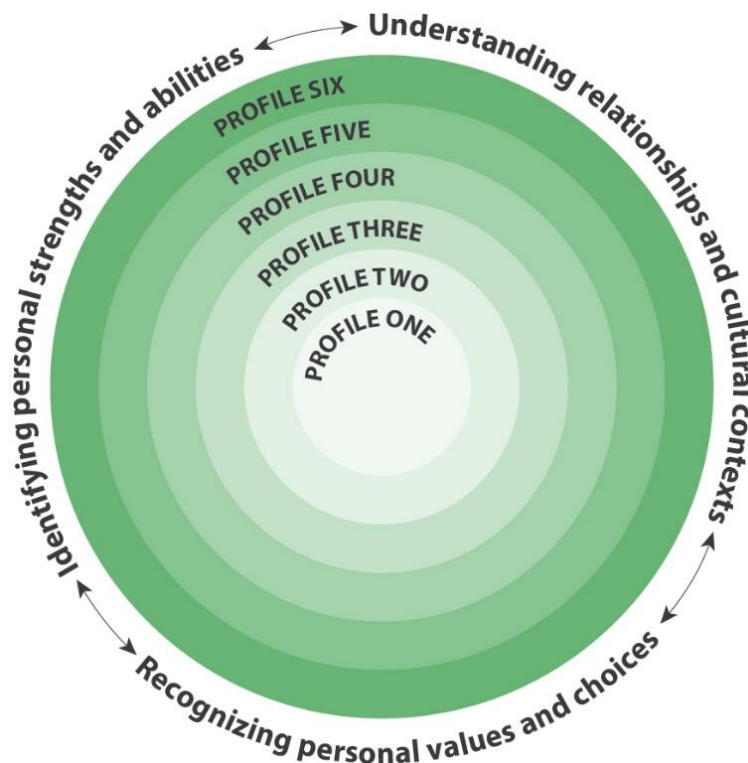
PROFILE	DESCRIPTION
PROFILE ONE	<p><b>I am aware of myself as different from others.</b></p> <p>I know my name. I am aware of some of my family and/or caregiver relationships.</p>
PROFILE TWO	<p><b>I am aware of different aspects of myself. I can identify people, places, and things that are important to me.</b></p> <p>With some help, I can identify some of my attributes. I can identify objects or images that represent things that are important to me and explain what I like and dislike. I can describe my family, home, and/or community (people and/or place).</p>
PROFILE THREE	<p><b>I can describe different aspects of my identity.</b></p> <p>I can identify my individual characteristics and explain what interests me. I can describe different groups that I belong to.</p>
PROFILE FOUR	<p><b>I have pride in who I am. I understand that I am a part of larger communities.</b></p> <p>I can describe and demonstrate pride in my positive qualities, characteristics, and/or skills. I can explain why I make specific choices. I am able to represent aspects of my cultural contexts (such as family, communities, school, peer groups) through words and/or images, and describe some ways that I participate in, or am connected to, a community.</p>



<p>PROFILE FIVE</p>	<p><b>I understand that my identity is influenced by many aspects of my life. I am aware that my values shape my choices and contribute to making me a unique individual.</b></p> <p>I understand that my characteristics, qualities, strengths, and challenges make me unique and are an important part of the communities I belong to (including people and places). I understand that what I value influences the choices I make and how I present myself in various contexts (including online). I can explain how I am able to use my strengths to contribute in my home and/or communities.</p>
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**I can identify how my life experiences have contributed to who I am; I recognize the continuous and evolving nature of my identity.**

<p>PROFILE SIX</p>	<p>I can identify ways in which my strengths can help me meet challenges, and how my challenges can be opportunities for growth. I understand that I will continue to develop new skills, abilities, and strengths. I can describe how aspects of my life experiences, family history, background, and where I live (or have lived) have influenced my values and choices. I understand that my learning is continuous, my concept of self and identity will continue to evolve, and my life experiences may lead me to identify with new communities of people and/or place.</p>
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## Core Competency – Social Awareness & Responsibility

Social Awareness and Responsibility involves the awareness, understanding, and appreciation of connections among people, including between people and the natural environment. Social Awareness and Responsibility focuses on interacting with others and the natural world in respectful and caring ways.

People who are socially aware and responsible contribute to the well-being of their social and physical environments. They support the development of welcoming and inclusive communities, where people feel safe and have a sense of belonging.

A socially aware and responsible individual contributes positively to their family, community, and environment; empathizes with others and appreciates their perspectives; resolves problems peacefully; and develops and sustains healthy relationships.

### PROFILE DESCRIPTION

PROFILE ONE	<p><b>I can be aware of others and my surroundings.</b></p> <p>I like to be with my family and friends. I can help and be kind. I can tell when someone is sad or angry and try to make them feel better. I am aware that other people can be different from me.</p>
PROFILE TWO	<p><b>In familiar settings, I can interact with others and my surroundings respectfully.</b></p> <p>I can build relationships and work and play cooperatively. I can participate in activities to care for and improve my social and physical surroundings. I use materials respectfully. I can solve some problems myself and ask for help when I need it. I listen to others' ideas and concerns. I can be part of a group and invite others to join. I can identify when something is unfair to me or to others.</p>
PROFILE THREE	<p><b>I can interact with others and the environment respectfully and thoughtfully.</b></p> <p>I can build and sustain relationships and share my feelings. I contribute to group activities that make my classroom, school, community, or natural world a better place. I can identify different perspectives on an issue, clarify problems, consider alternatives, and evaluate strategies. I can demonstrate respectful and inclusive behaviour with people I know. I can explain why something is fair or unfair.</p>
PROFILE FOUR	<p><b>I can take purposeful action to support others and the environment.</b></p> <p>I can build relationships and be a thoughtful and supportive friend. I can identify ways my actions and the actions of others affect my community and the natural</p>

environment. I look for ways to make my classroom, school, community, or natural world a better place and identify small things I can do that could make a difference. I demonstrate respectful and inclusive behaviour in a variety of settings, and I recognize that everyone has something to offer.

PROFILE FIVE

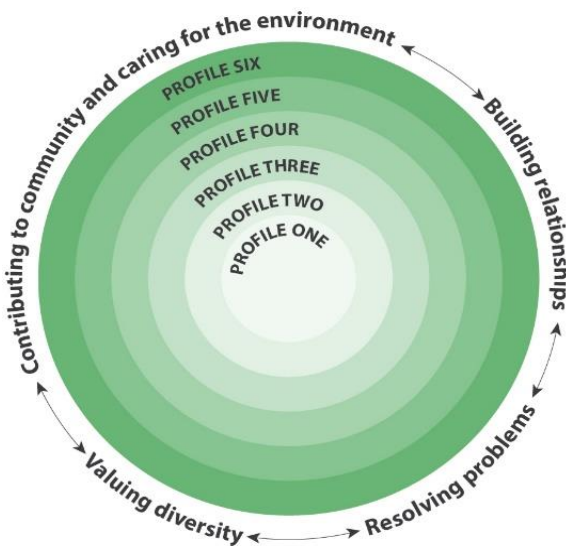
**I can advocate and take action for my communities and the natural world. I expect to make a difference.**

I am aware of how others may feel and take steps to help them feel included. I maintain relationships with people from different generations. I work to make positive change in the communities I belong to and the natural environment. I can clarify problems or issues, generate multiple strategies, weigh consequences, compromise to meet the needs of others, and evaluate actions. I value differences; I appreciate that each person has unique gifts. I use respectful and inclusive language and behaviour, including in social media. I can advocate for others.

PROFILE SIX

**I can initiate positive, sustainable change for others and the environment.**

I build and sustain positive relationships with diverse people, including people from different generations. I show empathy for others and adjust my behaviour to accommodate their needs. I advocate and take thoughtful actions to influence positive, sustainable change in my communities and in the natural world. I can analyze complex social or environmental issues from multiple perspectives and understand how I am situated in types of privilege. I act to support diversity and defend human rights and can identify how diversity is beneficial for the communities I belong to.



**Appendix D: Comparison of Teacher and Student Assessments**

**Communication Core Competency**

<b>Teacher</b>				<b>Student</b>				<b>Difference</b>			
Number:324				Number: 324				Number: 324			
Mean: 3.027778				Mean: 3.188272				Mean: -0.1604938			
tccomm	Freq.	Percent	Cum.	scomm	Freq.	Percent	Cum.	commdifx	Freq.	Percent	Cum.
1	12	3.70	3.70	1	16	4.94	4.94	-4	1	0.31	0.31
1.5	13	4.01	7.72	2	80	24.69	29.63	-3.5	3	0.93	1.23
2	43	13.27	20.99	3	99	30.56	60.19	-3	3	0.93	2.16
2.5	45	13.89	34.88	4	90	27.78	87.96	-2.5	11	3.40	5.56
3	85	26.23	61.11	5	34	10.49	98.46	-2	26	8.02	13.58
3.5	51	15.74	76.85	6	5	1.54	100.00	-1.5	16	4.94	18.52
4	50	15.43	92.28					-1	43	13.27	31.79
4.5	16	4.94	97.22	Total	324	100.00		-.5	41	12.65	44.44
5	8	2.47	99.69					0	63	19.44	63.89
5.5	1	0.31	100.00					.5	35	10.80	74.69
Total	324	100.00						1	42	12.96	87.65
								1.5	13	4.01	91.67
								2	18	5.56	97.22
								2.5	7	2.16	99.38
								3	2	0.62	100.00
								Total	324	100.00	

**Collaboration Core Competency**

<b>Teacher</b>				<b>Student</b>				<b>Difference</b>			
Number:324				Number: 324				Number: 324			
Mean: 2.839506				Mean: 3.12037				Mean: -0.2808642			
tccoll	Freq.	Percent	Cum.	scoll	Freq.	Percent	Cum.	colldifx	Freq.	Percent	Cum.
1	15	4.63	4.63	1	27	8.33	8.33	-4	1	0.31	0.31
1.5	23	7.10	11.73	2	67	20.68	29.01	-3.5	1	0.31	0.62
2	54	16.67	28.40	3	114	35.19	64.20	-3	6	1.85	2.47
2.5	56	17.28	45.68	4	83	25.62	89.81	-2.5	9	2.78	5.25
3	68	20.99	66.67	5	22	6.79	96.60	-2	26	8.02	13.27
3.5	48	14.81	81.48	6	11	3.40	100.00	-1.5	29	8.95	22.22
4	43	13.27	94.75					-1	41	12.65	34.88
4.5	13	4.01	98.77	Total	324	100.00		-.5	44	13.58	48.46
5	4	1.23	100.00					0	61	18.83	67.28
Total	324	100.00						.5	36	11.11	78.40
								1	39	12.04	90.43
								1.5	17	5.25	95.68
								2	8	2.47	98.15
								2.5	3	0.93	99.07
								3	2	0.62	99.69
								3.5	1	0.31	100.00
								Total	324	100.00	

**Creative Thinking Core Competency**

<b>Teacher</b>				<b>Student</b>				<b>Difference</b>			
Number:324				Number: 324				Number: 324			
Mean: 2.884259				Mean: 3.401235				Mean: -0.5169753			
tccreate	Freq.	Percent	Cum.	screate	Freq.	Percent	Cum.	createdifx	Freq.	Percent	Cum.
1	8	2.47	2.47	1	31	9.57	9.57	-5	1	0.31	0.31
1.5	15	4.63	7.10	2	56	17.28	26.85	-4.5	2	0.62	0.93
2	59	18.21	25.31	3	91	28.09	54.94	-4	2	0.62	1.54
2.5	63	19.44	44.75	4	70	21.60	76.54	-3.5	7	2.16	3.70
3	76	23.46	68.21	5	50	15.43	91.98	-3	14	4.32	8.02
3.5	53	16.36	84.57	6	26	8.02	100.00	-2.5	11	3.40	11.42
4	30	9.26	93.83					-2	33	10.19	21.60
4.5	11	3.40	97.22	Total	324	100.00		-1.5	28	8.64	30.25
5	8	2.47	99.69					-1	45	13.89	44.14
5.5	1	0.31	100.00					-.5	40	12.35	56.48
								0	40	12.35	68.83
Total	324	100.00						.5	29	8.95	77.78
								1	34	10.49	88.27
								1.5	20	6.17	94.44
								2	9	2.78	97.22
								2.5	5	1.54	98.77
								3	3	0.93	99.69
								3.5	1	0.31	100.00
								Total	324	100.00	

**Critical and Reflective Thinking Core Competency**

<b>Teacher</b>				<b>Student</b>				<b>Difference</b>			
Number:324				Number: 323				Number: 324			
Mean: 2.865741				Mean: 3.173375				Mean: -0.2978395			
tcritic	Freq.	Percent	Cum.	scritic	Freq.	Percent	Cum.	criticdifx	Freq.	Percent	Cum.
1	6	1.85	1.85	1	29	8.98	8.98	-3.5	1	0.31	0.31
1.5	15	4.63	6.48	2	66	20.43	29.41	-3	9	2.78	3.09
2	59	18.21	24.69	3	102	31.58	60.99	-2.5	9	2.78	5.86
2.5	65	20.06	44.75	4	79	24.46	85.45	-2	25	7.72	13.58
3	73	22.53	67.28	5	40	12.38	97.83	-1.5	31	9.57	23.15
3.5	56	17.28	84.57	6	7	2.17	100.00	-1	47	14.51	37.65
4	44	13.58	98.15	-----+-----				-0.5	37	11.42	49.07
4.5	3	0.93	99.07	Total	323	100.00		0	58	17.90	66.98
5	3	0.93	100.00	-----+-----				.5	44	13.58	80.56
-----+-----				-----+-----				1	29	8.95	89.51
Total	324	100.00		-----+-----				1.5	13	4.01	93.52
-----+-----				-----+-----				2	14	4.32	97.84
-----+-----				-----+-----				2.5	4	1.23	99.07
-----+-----				-----+-----				3	2	0.62	99.69
-----+-----				-----+-----				4	1	0.31	100.00
-----+-----				-----+-----				-----+-----			
-----+-----				-----+-----				Total	324	100.00	

**Personal Awareness and Responsibility Core Competency**

<b>Teacher</b>				<b>Student</b>				<b>Difference</b>			
Number:324				Number: 321				Number: 324			
Mean: 2.932099				Mean: 3.130841				Mean: -0.1697531			
tcpair	Freq.	Percent	Cum.	spar	Freq.	Percent	Cum.	pardifx	Freq.	Percent	Cum.
1	11	3.40	3.40	1	37	11.53	11.53	-4	2	0.62	0.62
1.5	13	4.01	7.41	2	65	20.25	31.78	-3.5	5	1.54	2.16
2	53	16.36	23.77	3	99	30.84	62.62	-3	10	3.09	5.25
2.5	51	15.74	39.51	4	70	21.81	84.42	-2.5	8	2.47	7.72
3	81	25.00	64.51	5	39	12.15	96.57	-2	20	6.17	13.89
3.5	48	14.81	79.32	6	11	3.43	100.00	-1.5	27	8.33	22.22
4	54	16.67	95.99	-----+-----				-1	49	15.12	37.35
4.5	12	3.70	99.69	Total	321	100.00		-.5	22	6.79	44.14
5	1	0.31	100.00	-----+-----				0	54	16.67	60.80
-----+-----								.5	32	9.88	70.68
Total	324	100.00						1	41	12.65	83.33
								1.5	25	7.72	91.05
								2	19	5.86	96.91
								2.5	5	1.54	98.46
								3	4	1.23	99.69
								4	1	0.31	100.00
								-----+-----			
								Total	324	100.00	



**Positive Personal and Cultural Identity Core Competency**

<b>Teacher</b>				<b>Student</b>				<b>Difference</b>			
Number:324				Number: 321				Number: 324			
Mean: 3.351852				Mean: 3.676012				Mean: -0.2901235			
tcppci	Freq.	Percent	Cum.	sppci	Freq.	Percent	Cum.	ppcidifx	Freq.	Percent	Cum.
1	2	0.62	0.62	1	23	7.17	7.17	-4	4	1.23	1.23
1.5	2	0.62	1.23	2	45	14.02	21.18	-3.5	4	1.23	2.47
2	26	8.02	9.26	3	68	21.18	42.37	-3	9	2.78	5.25
2.5	42	12.96	22.22	4	96	29.91	72.27	-2.5	15	4.63	9.88
3	66	20.37	42.59	5	55	17.13	89.41	-2	24	7.41	17.28
3.5	75	23.15	65.74	6	34	10.59	100.00	-1.5	24	7.41	24.69
4	86	26.54	92.28					-1	43	13.27	37.96
4.5	13	4.01	96.30	Total	321	100.00		-.5	41	12.65	50.62
5	11	3.40	99.69					0	48	14.81	65.43
6	1	0.31	100.00					.5	26	8.02	73.46
Total	324	100.00						1	44	13.58	87.04
								1.5	12	3.70	90.74
								2	15	4.63	95.37
								2.5	8	2.47	97.84
								3	4	1.23	99.07
								3.5	2	0.62	99.69
								4	1	0.31	100.00
								Total	324	100.00	

**Social Awareness and Responsibility Core Competency**

<b>Teacher</b>				<b>Student</b>				<b>Difference</b>			
Number:324				Number: 321				Number: 324			
Mean: 2.941358				Mean: 3.339564				Mean: -0.367284			
tcsar	Freq.	Percent	Cum.	ssar	Freq.	Percent	Cum.	sardifx	Freq.	Percent	Cum.
1	9	2.78	2.78	1	32	9.97	9.97	-4	2	0.62	0.62
1.5	9	2.78	5.56	2	56	17.45	27.41	-3.5	3	0.93	1.54
2	50	15.43	20.99	3	92	28.66	56.07	-3	17	5.25	6.79
2.5	53	16.36	37.35	4	72	22.43	78.50	-2.5	12	3.70	10.49
3	103	31.79	69.14	5	50	15.58	94.08	-2	33	10.19	20.68
3.5	40	12.35	81.48	6	19	5.92	100.00	-1.5	19	5.86	26.54
4	43	13.27	94.75	Total   321 100.00				-1	46	14.20	40.74
4.5	16	4.94	99.69					-.5	29	8.95	49.69
5	1	0.31	100.00					0	58	17.90	67.59
Total   324 100.00								.5	31	9.57	77.16
								1	29	8.95	86.11
								1.5	18	5.56	91.67
								2	15	4.63	96.30
								2.5	6	1.85	98.15
								3	5	1.54	99.69
								4	1	0.31	100.00
								Total   324 100.00			

