Measuring Students' Socio-Emotional Well-being to Optimize Learning: Looking beyond Academic Performance and Grades

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Research Partnerships Program

Final Research Report

Abstract

Socio-emotional variables, like engagement, motivation, and collaboration, are profoundly involved in the learning process. Targeting those variables in designing instructional activities may increase the potential of students' academic success (e.g., stronger school performance and more persistence during post-secondary education) and social success (e.g., better employment status and higher earnings). To better understand how these variables are involved in student learning, we developed The Student Voice Survey to measure students' levels of socio-emotional variables in Calgary Catholic School District (CCSD) schools. This survey includes seven socio-emotional variables: Championing, Instructional Practice, Student Success, Student Wellness, Empowerment and Resilience, Social Competence, and Emotional/Physical Safe Environment. Our analyses showed that the survey is psychometrically strong and provided evidence for reliability, construct validity, face validity and content validity, thus overall demonstrating reliability and trustworthiness of survey findings. Student Success (*M* = 3.24, *SD* = 0.53) and Social Competence (*M* = 3.22, *SD* = 0.53) were rated the highest, while Student Wellness was rated the lowest (*M* =2.27, *SD* = 0.81) socio-emotional variable by students, and thus has the greatest room for improvement in our educational systems. Some differences in the levels of socio-emotional variables were consistent across school regions, yet further research is required in this area for more definite findings. Overall, the outcome of this study will help inform schools on how to develop and improve programs that enhance students' learning experiences and promote their future success.

Keywords: socio-emotional learning; student success; psychometric analysis; Catholic education; mixed method study

Classification: Protected A

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Introduction

Rationale for the Research

A strong understanding of students' non-cognitive skills including personal and social dimensions (e.g., motivation, engagement, motivation, and collaboration) could help teachers and school-based professionals to develop instructional strategies that not only enhance students' learning experiences but also improve their future success. To measure non-cognitive skills accurately, school districts need to build the capacity to develop and administer their own instruments of non-cognitive constructs so that they may continue to collect information regarding students' socio-emotional wellbeing and its impact on student success both academically and socially. The purpose of this study was to develop and implement a psychometrically- sound, high-quality instrument—called Student Voice Survey—that measures students' non-cognitive skills and informs school-based professionals regarding students' socio-emotional well-being.

Project Background

Learning is primarily an emotional process, but it is often discussed solely from a cognitive perspective (Damasio, 2001; 2007). Aspects of cognition, like reasoning, attention, memory, problem-solving, and language, have been most heavily focused on in schools and educational research (Glaser, 1991; Greeno et al., 1996; Salomon, 1997). However, cultivating life-long learning habits in students for acquiring new knowledge and skills involves more than a focus on cognitive skills. Life-long learning habits develop within a context of social and emotional interactions; for example, a safe and supportive context of student-to-teacher relationships (see Pianta, 1999). In 2003, the United Nations Educational, Scientific and Cultural

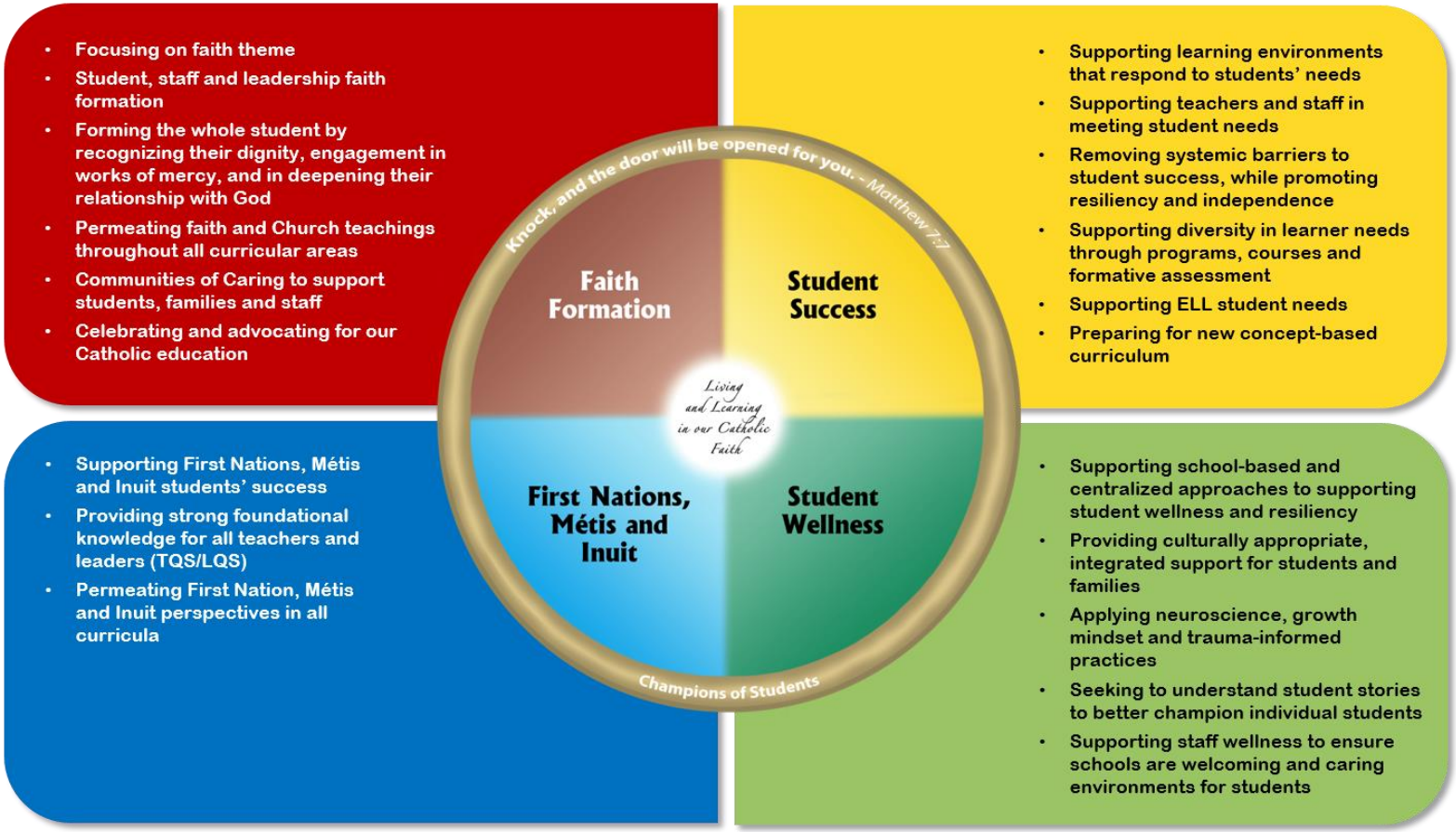
Organization spearheaded a global effort to promote the growing empirical research that supports the use of social and emotional attributes in academic learning endeavors (Durlak et al., 2011, 2015; Elias, 2003; Greenberg, et al., 2003; Hoffman, 2009; Pellegrino & Hilton, 2012; Zins, et al., 2004). Over the past decade, there has been an increasing number of studies that have shown that socio-emotional attributes (e.g., engagement, motivation, and collaboration) are important in education because they have a more profound and lasting impact on student success, both academically (e.g., stronger school performance and more persistence during post-secondary education) and socially (e.g., better employment status and higher earnings; Kyllonen, 2016; Lee & Shute, 2009).

Prior Research

The Champions of Students framework, shown in Figure 1, guides the Calgary Catholic School District (CCSD)'s initiative that "Every child deserves a champion: An adult who will never give up on them, who understands the power of connection and insists they become the best they can possibly be" (CCSD, 2017, para. 1). This initiative encourages every student to connect with a champion. The term champion is most often referred to as teachers, administrators, caretakers, support staff, mentors, or coaches. These roles describe a positive and stable caring relationship between a student and an adult. In addition to helping each student find a champion in their school, another goal of this initiative is to develop champion qualities in both students and staff. CCSD defined four priorities for students and staff to focus on developing: faith formation; student success; First Nations, Métis, and Inuit; and student wellness. These priorities form the four main sub-scales of the social-emotional instrument designed for CCSD.

Figure 1

Calgary Catholic School District's "Champion of Students" Framework



Faith formation is at the heart of living a Christian life. Spirit and Truth Publishing (an independent faith formation publishing company) defined faith formation as actions, experiences, and/or relationships that nurture a transformative relationship of trust with God and shapes the way one interacts with God's world. They added that faith formation is the process by which one's faith grows and one's life is shaped by God's love. In their latest book, *Generations Together: Caring, Praying, Learning, Celebrating, and Serving Faithfully*, Amidei and colleagues (2014) affirmed that a person is informed and transformed by faith formation. They further indicated that faith formation influences the whole person: the head, the heart, and the hands. Faith formation is acknowledged by clergy and laypeople to be an essential component in the development of faith in children. The research confirmed that there are both religious rituals and human relationships that can positively influence the faith formation of youth (Bengtson et al., 2017; Friedman & Roehlkepartain, 2010).

Participation in religious rituals can play a significant role in the faith formation of youth (Amidei et al., 2014). Prayer is a religious ritual that has the potential to strengthen a child's relationship with God (Neifert, 2011) as interpersonal communication strengthens friendships and family relationships. Prayers provide a continual reminder to children of the presence of God in their lives. For example, starting the school day with a prayer acknowledges God's presence in their learning environment. Saying grace at meals teaches children to acknowledge God as a source of their daily provisions. Bedtime prayers provide a routine for praising God and thanking Him for their daily blessings. Having children participate in liturgies and other means of formal worship also have a positive influence on children's faith formation (Martinson et al., 2010). These experiences present children with opportunities to participate alongside

their families who model the love of God. They experience familiar rituals associated with faith tradition. Initially, young children do not understand what is said at a worship service. However, by participating in these rituals they acquire attitudes and learn about their faith. Seeing the symbols of their faith, hearing worship music, and reciting the responses add to the children's faith formation (Friedman & Roehlkepartain, 2010). Friedman and Roehlkepartain (2010) added that teachers have the potential to serve as a living commentary on the Scriptures, and family activities, suppers, and music performances sponsored by the children's place of worship create positive attitudes about their faith.

Teaching children to be kind to others connects them to God who loves and cares for all. When children learn to be generous, compassionate, and kind to others, they also gain a good understanding of and experience a connection with God (Friedman & Roehlkepartain, 2010). A study conducted by Amidei et al. (2014) indicated that of the human influences on the faith formation of youth, parents have the greatest influence. Both protestant pastors and Catholic priests universally agree that faith formation starts with parents. In addition, they also generally agree that the church is the second most influential factor, the Christian community (outside of the church) is third in the line of influence, the school is fourth, and the government/society is ranked fifth. Although most church leaders rank these top five influences in the same order, Catholic priests believe that the schools play a significant role in the formation and development of children's faith. A strong foundation in the faith formation of youth leads to a strong faith formation in adults. Parents are the most influential in shaping the faith formation of their children. The faith practices of family, devotions, prayers, rituals, and participation in religious celebrations all influence the faith formation of children (Smith & Snell, 2010). Catholic

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schools can play a significant role by involving children in caring conversations, participation in prayers and rituals, and assisting the church in sacramental preparation. Thus, all stakeholders namely, parents, schools, and parish are presented with an exciting opportunity to work together to form faith-filled citizens of tomorrow.

Other important parts of CCSD's Champions of Students framework are students' success and wellbeing. The development of social-emotional competence is an important foundation for student success and well-being. Children need a balanced set of cognitive, social, and emotional skills to achieve positive outcomes in school and life in general (Goldberg et al., 2019; OECD, 2015). The key social-emotional skills essential for young children as they enter school include the capacity to develop positive relationships with peers and adults, the ability to concentrate and persist on challenging tasks, effectively communicating emotions, listening to instructions, and being attentive, in addition to self-confidence and skills in solving social problems (Shonkoff & Philips, 2000). Social and emotional skills (e.g., social competence, emotional regulation, and responsible decision making) have a positive impact on overall health and wellbeing (Goldberg et. al, 2019; Goodman et al., 2015). The development of these social-emotional skills helps young children feel more confident and competent in building strong relationships and friendships, resolving conflicts, persisting when faced with challenges, coping with anger and frustrations, and managing emotions (Parlakian, 2003).

Many research studies have also tied social-emotional competence along with cognitive competence to academic achievement. Non-cognitive skills like collaboration and motivation and cognitive skills like reading, writing, and critical thinking could be important predictors of students' academic achievement (e.g., DiPerna et al., 2002). For example, Bernard (2004) found

that social-emotional competence can be a strong predictor of children's early literacy skills. The author also indicated that children considered at-risk for academic difficulties displayed significantly lower levels of competence in the areas of confidence, persistence, and organization (Bernard, 2004). Collectively, the results of the study supported the view that social-emotional competence is foundational for the achievement and well-being of young children. These findings are in line with the previous studies that also highlighted the important role of promoting social-emotional competence to improve both social-emotional attributes and achievement (e.g., Ashdown & Bernard, 2012; Nelson et al., 2003; Payton et al., 2008).

In an early study, Wentzel (1991) proposed that promoting social responsibility within the classroom can promote positive interactions with teachers and peers through motivation and empowerment, and thus, facilitate learning and performance outcomes. Student empowerment particularly is frequently equated with increased student participation in the learning process (Dimick, 2012). Empowered learners are more likely to engage in meaningful learning processes by completing learning tasks with higher motivation and competency (Houser & Frymier, 2009). This finding also indicates the importance of school systems focusing on the empowerment of students for better achievement. Bryan and Henry (2008) also supported the idea of school systems supporting student empowerment but they emphasized that school counselors, families, and community members also need to come together in partnership and collaborate to "implement classroom, schoolwide, and community-based programs and interventions that support and empower children and families" (p. 149). These partnerships should aim to create environments that are strength-enhancing, promote caring

and positive adult-child relationships and social support networks, foster academic success, and empower children with a sense of purpose (Bryan & Henry, 2008).

With increasing attention on non-cognitive skills and socio-emotional well-being, there has been more research demonstrating the significance of social and emotional learning (SEL). SEL aims to teach students the social and emotional skills that contribute to higher academic achievement (Brackett et al., 2012; Salovey & Sluyter, 1997; Zins et al., 2004). A meta-analysis of 207 studies by Durlak et al. (2011) examined the effects of SEL programs on academic achievement and revealed that students enrolled in SEL programs perform significantly better in school and on standardized tests compared to their non-participating peers. In addition to academic performance, SEL participants also demonstrated significantly improved social and emotional skills, attitudes, and behavior compared to controls. Like many others, this study showed the positive impact of SEL and highlighted the importance of supporting and incorporating SEL programs in educational practice to contribute to the healthy development of children. Economists are thus calling for a greater focus on these non-cognitive skills, because it has been shown that the greatest returns on education investments are “from nurturing children's non-cognitive skills, giving them social, emotional and behavioral benefits that lead to success later in life…” (Committee for Economic Development, 2004). In fact, among the factors that have been reported to increase academic success were improved quality of interpersonal relationships between teachers and students, and a decrease in problem behavior, thus overall, promoting SEL (Brackett, 2012; Elias et al., 1997).

A balance between cognitive, social, and emotional skills is thus essential and can be established through instructional practices focusing on all of these skills. Notably, research

indicated that social and emotional skills are malleable, and suggested that they can be effectively taught using a variety of approaches including classroom-based and whole-school approaches (Goldberg et al., 2019; Jones & Bouffard, 2012). Extensive research has studied specific instructional practices to find what works best for students and what research-informed instructional practices include. For example, some of the instructional practices shown to be effective by Brophy (1986) included the teacher emphasizing academic objectives in establishing expectations and allocating time, using effective time management strategies, pacing students through the curriculum rapidly but in small steps, and adapt curriculum materials based on teachers' knowledge of their students' characteristics (Brophy, 1986).

Student engagement is one of the indicators of student success (Zepke & Leach, 2010). Pekrun and Linnenbrink-Garcia (2012) distinguished five types of engagement: cognitive, motivational, behavioral, cognitive-behavioral, and social-behavioral engagement, all of which are dependent on the learning environment that fosters positive and encouraging interactions, positive academic emotions, and achievement. Students with higher behavioral and cognitive engagement have shown higher grades and aspire to higher education (Wang & Eccles, 2012a). Wang and Degol (2014) stated that "when students are engaged with learning, they can focus attention and energy on mastering the task, persist when difficulties arise, build supportive relationships with adults and peers, and connect to their school (Wang & Eccles, 2012a, 2012b)" (p. 137). Engagement is thus central to student success, resilience, and social and emotional wellbeing.

Classrooms and schools are the ideal environments not only for learning but also for social interactions. Fitting into that environment and interacting with teachers and peers may

come easier to some students than others. Juvonen (2006) addressed the question of whether social success in forming and maintaining positive relationships is associated with students' school engagement and academic performance. She reviewed a variety of evidence on the links among sense of belonging, school-based social bonds, and school functioning, and found that strong relationships with adult supporters at the school (e.g., champions) may be considered one of the ways through which students may feel a stronger sense of belonging at their schools, and therefore may be more engaged and maintain motivated social behaviours, and gain better achievement.

Research Questions

The aims of this study were twofold: (1) to develop a high-quality instrument to measure students' levels of non-cognitive skills and (2) to investigate how these skills could optimize learning for all students. The specific research questions that guided these two aims were:

For the first goal:

- Did the instrument exhibit strong psychometric properties for each subscale and as a whole? Psychometric properties that were investigated in this study included reliability and validity (i.e., construct, criterion, face, and content) of the instrument.

For the second goal:

- Which non-cognitive skills were rated the lowest or had the greatest room for improvement?
- Were non-cognitive skills different among the different regions of Calgary (NW, NE, SW, SE) and outside the city (Airdrie, Chestermere, Cochrane)?

- Which non-cognitive variables best predicted optimum learning for all students?

Practitioner – Researcher Collaboration

Our research team included members from three universities in Alberta and a school district in a large urban area of Calgary. The approach taken to create and conduct this research project was highly collaborative. Through this project, we have learned a great deal about running a large partnership project consisting of multiple members from various organizations. The following sections summarize how our research team has made a collective effort to complete our partnership project.

Research Partnership Overview

This research collaboration was formed when Drs. Okan Bulut and Man-Wai Chu had an initial conversation about the need for developing a new SEL instrument for CCSD. Through a research organization, CCSD has been administering an SEL measure to students annually and used the results to inform instructional practices. However, CCSD needed a comprehensive instrument aligned with their “Champion of Students” framework. Therefore, Drs. Bulut and Chu decided to collaborate with CCSD to develop a new SEL instrument. With the announcement of a new RPP call, Dr. Bulut (University of Alberta) and Dr. Chu (University of Calgary) began to form a research team that included Dr. Paolina Seitz from St. Mary’s University and several partners from the CCSD team. Both Dr. Chu and Dr. Seitz are alumni of the Measurement, Evaluation, and Data Science (formerly, Measurement, Evaluation, and Cognition) program at the University of Alberta. Furthermore, Dr. Chu has already established a good relationship with CCSD and other school districts in the Calgary area. These connections

and relationships have helped us build a strong partnership between multiple organizations in this project.

During our project, our partnership has evolved as we expanded our research team to include two graduate students. Maryam Hachem is a doctoral student at the University of Calgary, Department of Educational Research. Based on Maryam's previous work with Dr. Chu focusing on socio-emotional development, she was the ideal candidate to join the team to provide content and technical support regarding the SEL measures. Guher Gorgun is a doctoral student at the University of Alberta, Department of Educational Psychology. Guher, who is supervised by Dr. Bulut in the Measurement, Evaluation, and Data Science program, has the psychometric and statistical expertise to develop instruments measuring non-cognitive skills. Guher has assisted our research team with a variety of tasks, such as data management, data analysis, and report writing. Throughout the project, Guher has worked closely with Maryam in completing the required tasks of our project, which was another outcome of our strong collaboration.

Celebrations

Through this Practitioner-Researcher collaboration, we learned a great deal about the research approval process at each of our collaborating institutions. First, we had to obtain ethics approval from both the University of Alberta and the University of Calgary to initiate the project. Furthermore, data collection from schools could not begin until CCSD approved the research team's application to conduct research. Our research team managed to complete these applications in a timely manner and started the data collection process.

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Since the beginning of this project, our research team has engaged in regular meetings, which included both face-to-face and online meetings, to discuss the research process, goals, and outcomes. Because a portion of our research team was in Edmonton, they participated in the in-person meetings held in Calgary through Zoom. We also had regular e-mail discussions for our project. Our healthy communication was highlighted during each of our data collection days as the members of both the academic and CCSD communities worked collaboratively to schedule and discuss the logistics of our data collection days. Each of our data collection sessions also went very smoothly, which also indicated our team cohesiveness to achieve the goals of our project. The CCSD team members actively contributed to instrument development and literature review and facilitated the school-level implementation process of the instrument and the interviews.

The entire research team is also collaborating in presenting the findings of the study through conferences and publications. Due to the COVID-19 pandemic, our team could not attend several knowledge-mobilization events across the province. However, the members of our research team, including our partners from CCSD, are still planning to jointly present the findings at ULead, College of Alberta School Superintendents (CASS), and the IDEAS conferences within the next 12 months. The partner organizations and collaborators are also participating in creating technical reports that are required by their organizations.

Another celebration for our research team was the opportunity to work with two graduate students. Through the RPP grant funds, we were able to hire Maryam and Guher and to provide them mentorship in conducting educational research. Both students have played a significant role in data collection, data analysis, and knowledge mobilization processes by

getting involved with the preparation of conference proposals, technical reports, and research manuscripts along with the other team members.

Challenges

In addition to celebrations, our research team has also faced several challenges throughout the project. For example, although our partners in CCSD were very helpful in reaching out to the students for our pilot study, we were not able to obtain parental consent forms from a large group of students in time. We administered the pilot survey to over 1000 students, but only received consents from 382 students. However, we managed to collect enough data to achieve the goals of our pilot study in the end.

Another challenge was the impact of the COVID-19 pandemic on our knowledge and mobilization plans. Although our team was able to complete the data collection successfully before school closures due to the pandemic, the social distancing measures prevented us from presenting the results of our project at various conferences. Specifically, our research team was accepted to present our findings in front of the College of Alberta School Superintendents (CASS) and the annual meeting of uLead. However, both meetings were postponed for one year; as such, we will be presenting our project findings at these meetings during 2021.

RPP Cohort

This research partnership project was a part of the third cohort of studies funded through Alberta Education's Research Partnerships Program (RPP). Members of our research team regularly participated in cohort events including the Alberta Education hosted meetings. For each of the face-to-face cohort meetings in Edmonton, at least two participants of our team (one representing the university partners and another representing CCSD) attended and

informed other grant recipients about our progress. Other cohort supports that the Research Branch of Alberta Education provided us included an interim report template that grant recipients had the opportunity to provide input on and a detailed guideline on the required elements of the final report. RPP grant recipients were also provided the opportunity to participate in the fall 2019 Alberta Research Network meeting and profile their studies in a break-out session.

Celebrations

Being a part of a cohort was very helpful in terms of knowing what other research teams were investigating within the province and to build upon each other's research findings. The cohort meetings hosted by the Research Branch of Alberta Education also allowed our team to get to meet in person and network with other researchers around the province. Providing Alberta Education with the interim and final reports were also helpful for keeping our team on track in terms of maintaining our timelines.

Challenges

One of the challenges with being in a cohort was the use of the interim and final report template which was designed to be used by all research teams in the cohort. However, with a general template, some of the headings and sections did not necessarily work for our specific research project. As such, we had to modify some of the template headings to fit the needs of our study. Future reports may want to use the report template headings as a guideline, with the flexibility of modifying them based on the content of each project. Another challenge was to complete and submit a research activity update monthly. Because our project did not necessarily produce significant outcomes for each month, we did not have any major item to

report in the research activity update for some months. For future RPP cohorts, the Research Branch may consider asking each research team to determine a list of pre-determined dates to submit their research activity reports.

Lessons Learned

Overall, the research partnership project was a positive experience for all of our team members. First of all, it brought together researchers from different institutions across Alberta. Despite living in a digital world, it is not always easy to work with other researchers remotely. In this project, we learned how to build the foundation for successful team dynamics. Working with each other while managing all the tasks planned for our project helped us understand how we can build successful collaboration. In future projects, we hope to maintain the same level of collaboration among all partners in order to achieve our research goals.

Through this project, we also learned how to manage the project budget with partners from several organizations. Because Dr. Bulut was the principal investigator on the project, the grant funds were held and managed at the University of Alberta. However, our research team was able to use the budget for data collection activities in Calgary, mileage reimbursement for partners who traveled to Edmonton for the face-to-face cohort events, and hiring a graduate student from the University of Calgary. Our research team will benefit from these experiences when developing future projects.

Suggested Next Steps

Although we have completed the research component of the project, including data collection, descriptive and psychometric analysis of data, and report writing, we are looking forward to disseminating the results of our project to a wider audience through presentations

and publications. Currently, two publications are in progress: a psychometrics-focused paper on developing an SEL instrument and a theoretical paper about social-emotional learning. We will submit the publications to high-impact journals to advance the field of education. Open-access venues have been prioritized so the results and impact of the findings can be available to the public. Furthermore, we have already got accepted to present at the uLead Conference that will be held in April 2021, and our submission to CASS and IDEAS conference is pending the new conference dates after the original ones have been postponed due to COVID-19.

The next steps for our research team, and other research teams in future cohorts, would be to view these RPP grants as *seed funding* that helps us strengthen our proposals for future grant funding opportunities with national organizations such as the Social Sciences and Humanities Research Council (SSHRC). For our study, now that we have a psychometrically-sound instrument to measure students' socio-emotional skills, we hope to continue our work by monitoring students' self-reported levels of these important skills longitudinally. An interesting future study for our research team would be to track and investigate students' self-reported levels of socio-emotional skills during this time when COVID-19 may be impacting students not just academically, but also their socio-emotional well-being.

Lastly, there are also suggested next steps for the Research Branch regarding the implementation of RPP projects. Due to the COVID-19 pandemic, the Research Branch had to create online events, instead of face-to-face meetings, where the research teams had the opportunity to share their findings with a large group of participants. We believe that online webinars allow both researchers and practitioners to participate in such events and benefit from the results of our research. Therefore, the Research Branch may consider continuing

webinars and other online events after Alberta ends social distancing measures related to the pandemic. Also, the Research Branch may consider allowing the future cohorts to create pre-recorded webinars/videos and share them on a publicly-accessible website maintained by Alberta Education.

Research Design

Framework and Design

This research project included the development of an instrument to measure students' socio-emotional wellbeing. The aims of this study were twofold: (1) to develop an instrument to measure students' levels of several non-cognitive skills and (2) to investigate how these skills optimize learning for all students. As such the research design included a pilot study and the main study.

Pilot Study

To investigate the development and psychometric properties of the survey, a mixed-methods approach was followed (Creswell & Poth, 2017). The ethics board at the University of Alberta and CCSD approved this study before the start of the data collection in schools.

Research Questions. The pilot study was designed to address the following research: RQ1: Did the instrument exhibit strong psychometric properties for each subscale and overall when measuring the target non-cognitive skills?

Research Sites. Four schools were selected by the school district administrator, who was a part of the research team, to provide our research team with a balanced spread of students that ranged from Grades 4 to 12 (i.e., the intended audience of this instrument) and with a balanced spread of schools from different locations within the city so that a representative sample of the CCSD student population could be obtained.

Participants. Students enrolled in these four schools were approached by the research team in person during class times and invited to provide us permission to use their responses to the instrument developed for our study. While the student agency was honoured by providing

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them the opportunity to assent, formal consent was requested from their parents or guardians. All students were administered the Student Voice Survey and it was completed by 1012, but only those who returned their parental consent form and also signed their student assent form, confirming the research team could use their data for the study, had their responses compiled for data analysis. In total, responses from a total of 382 students were used. Hence, our sample was much smaller than initially planned.

Most of the students self-identified to be female (*n* = 206; 54%), some self-identified as male (*n* = 160; 42%), and a few (*n* = 15; 4%) chose not to identify their gender. Most of the students were enrolled in Grades 4-6 (*n* = 217; 57%) and only a few enrolled in Grades 10-12 (*n* = 38; 10%) although we used a sampling strategy to obtain a balanced sample with regard to grade levels for the pilot study. Most of them indicated they were born in Canada (*n* = 272; 71%), but had no First Nations, Métis, or Inuit heritage (*n* = 322; 84%). Most of the students (*n* = 348; 91%) spoke English or English with an additional language at home (Table 1).

Student Voice Survey. The Student Voice items were designed to measure the following aspects of socio-emotional well-being: Faith Formation, Championing, Instructional Practice, Student Success, Engagement, Student Wellness, Commitment to Learning, Outlook and Resilience, Social Competence, Emotional/Physical Safe Environment, Empowerment, and Family/Community Support. Two versions of the instrument were used, one for elementary students and one for secondary students, given different socio-emotional contexts for these grade levels. The elementary instrument contained 62 questions and the secondary instrument contained 65 questions. Most questions on both versions of the instrument were the same. The

Student Voice items were administered using a 4-point Likert scale (i.e., 1=*strongly disagree*, 2=*disagree*, 3=*agree*, and 4=*strongly agree*).

***Data Collection*.** The pilot Student Voice survey (see Appendix A) was administered in May-June 2019 to over 1000 students enrolled in four different schools. The researchers provided students with the website address of the Student Voice survey, and with the help of teachers, asked them to use school computers to access the instrument and complete it online, without any time limitation.

***Data Analysis*.** Data analysis was performed through the SPSS software program to obtain descriptive statistics for individual items and reliability statistics for the subscales of the Student Voice survey. Analyzing pilot data allowed us to revise the existing items that did not function properly and eliminate the items that could not differentiate students' responses (i.e., most students selected the same response option).

Student Interviews. Additionally, a subset of the students who had parental consent forms indicating their data could be used for the study was interviewed to better understand their views of the Student Voice survey. The students who participated in the interviews were recommended by school administrators and teachers as students who were articulate and were able to communicate with researchers in English. Eight students were invited to an individual, face-to-face interview; two students from each of the four schools that had participated in the pilot study. All eight students accepted to participate in the interviews. Through this interview process, the students shared their thoughts about the Student Voice survey.

Data Collection. Student interviews were structured and facilitated by a member of our research team. The interviews took place with the participating students in their schools after

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they completed the Student Voice survey. The interview questions were designed to help improve the initial version of the instrument so that it could be revised and used in the main study. The goal of this practice was to make the survey more representative of students' socio-emotional wellbeing to help provide us with more useful findings. These interviews were structured, asking specifically about students' opinions regarding the items on the instrument. The following was the list of questions that students answered:

- What are your thoughts about the Student Voice survey?
- Do you think that the questions were good enough to represent your social and emotional learning experiences?
- How would you define student engagement?
- As a student, when do you feel empowered?
- What kind of support do you think students should receive from their families? Their teachers and schools?
- Can you name a few things that affect your mental wellness?

Do you have any suggestions or ideas that you believe are important regarding your well-being that we might have missed in the Student Voice survey?

***Data Analysis*.** Audio-recorded interviews were transcribed by the research assistant on the team. Transcripts were imported into the NVivo software program, which was used to code the interviews through inductive coding. Emerging codes were classified into different categories of description.

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Table 1

Demographics of the Pilot Student Voice Survey

General (*n* = 382)	Frequency (%)
1. What is your gender?	
Male	160 (42%)
Female	206 (54%)
Choose not to answer	15 (4%)
2. What is your age range?	
8-10	140 (37%)
11-13	145 (38%)
14-16	82 (21%)
17-20	15 (4%)
3. What is your grade level?	
Grade 4	97 (25%)
Grade 5	64 (17%)
Grade 6	56 (15%)
Grade 7	38 (10%)
Grade 8	59 (15%)
Grade 9	30 (8%)
Grade 10	17 (5%)
Grade 11	13 (3%)
Grade 12	8 (2%)
4. Were you born in Canada?	
Yes	272 (71%)
No	110 (29%)
5. What languages are spoken in your home?	
English	191 (50%)
French	0 (0%)
Both English and French	9 (2%)
English and another language	139 (36%)
French and another language	1 (1%)
English, French and another language	10 (3%)
Other	32 (8%)
6. Does your background include First Nations, Métis or Inuit heritage?	
Yes	35 (9%)
No	322 (84%)
Choose not to answer	25 (7%)

Main Study

Our research team used both qualitative data (i.e., interviews) and quantitative data (i.e., psychometric features and descriptive statistics on the items) to revise the items on the Student Voice survey. Then, the revised instrument (see Appendix B) was administered to students between October and December of 2019. Statistical analysis was performed using the new data and the questions related to the objectives of the study were investigated.

Research Questions. The original research questions that we aimed to address in the main study of our project were:

- RQ 2: Which non-cognitive skills were rated the lowest or had the greatest room for improvement?
- RQ 3: Were non-cognitive skills different among the different regions of Calgary (NW, NE, SW, SE) and outside the city (Airdrie, Chestermere, Cochrane)?
- RQ 4: Which non-cognitive variables best predicted optimum learning for all students?

Due to some changes in the study, the last research question (i.e., RQ 4) could not be addressed. More specifically, due to the COVID-19 pandemic and the cancelation of the PAT tests, we were not able to collect student achievement levels across schools. Also, our CCSD partners strongly recommended refraining from linking student responses to the Student Voice survey with achievement data, which would have prevented anonymous data collection from students. However, knowing that responses would not be anonymous might have changed how students responded to the Student Voice survey. Therefore, our research team decided not to link any achievement data to the data collected via the Student Voice survey.

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Research Sites. The revised Student Voice survey was administered in 114 schools in a large urban school district of Calgary.

Participants. In total, 29,384 students responded to the revised Student Voice survey. An equal proportion of students self-identified as male (*n* = 14,183; 48%) and as female (*n* = 14,005; 48%). A few (*n* = 1,196; 4%) chose not to identify their gender. A similar number of the students were enrolled in Grades 4-6 (*n* = 11,790; 39%) and in Grades 7-9 (*n* = 10592; 36%), while fewer students were enrolled in Grades 10-12 (*n* = 7,002; 25%). Most students indicated they were born in Canada (*n* = 19,697; 67%), and had no First Nations, Métis or Inuit heritage (*n* = 25,415; 86%). Most of the students (*n* = 26,657; 92%) spoke English and/or English with another language at home. These statistics are found in Table 5 of the Findings section.

Student Voice Survey. For the main study, our research team worked collaboratively to update the items based on the analysis of the pilot data, including both statistical analysis and interview analysis. Our primary goal in these revisions was to make the items and subscales shorter and clearer throughout the survey, and items that were shown to overlap with other subscales were removed from the final version of the Student Voice survey. Like the pilot study, two versions of the revised Student Voice survey were administered to students, one for elementary students and another for secondary students. The latter instrument included two additional items that were more relevant to secondary students: “When I finish high school, I am planning to attend college or university,” and “When I finish high school, I am planning to attend a technical school to obtain a trade or apprenticeship.” The rest of the instrument was identical in both versions. The revised instrument was designed to measure the following aspects of SEL: Faith Formation, Championing, Instructional Practice, Student Success,

Engagement, Student Wellness, Commitment to Learning, Empowerment and Resilience, Social Competence, Emotional/Physical Safe Environment. Faith formation items were administered using a dichotomous scale (1=Yes, 2=No), while the remaining items were administered using a 4-point Likert-scale (1=*strongly disagree*, 2=*disagree*, 3=*agree*, and 4=*strongly agree*).

Data Collection. The revised Student Voice survey was administered to 29,384 students during October and December of 2019. The survey was administered by CCSD in 114 elementary and secondary schools. Both administrators and teachers administered the instrument in the schools by providing students with the link to the online Student Voice survey and asking them to complete it using school computers. They also guided students when students were confused about what a question was asking.

Data Analysis. Upon completion of the data collection phase, our research team received an anonymized version of the data excluding all identifying information. Next, we initiated statistical analysis of the data (i.e., descriptive analysis, reliability, factor analysis, multivariate analyses, and regression analyses) through the SPSS and R software programs. Several team meetings were held throughout the process of data analysis to get feedback from all team members and to ensure the most appropriate statistical analyses were being done. Table 2 presents a summary of the data analysis methods that we used for addressing the three research questions of our project.

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Table 2

Data Analysis Methods Used for Addressing the Research Questions

Research Question	Data Analyses
1. Does the survey exhibit strong psychometric properties for each subscale and as a whole instrument?	
Reliability	Cronbach alpha values
Construct Validity	Exploratory and confirmatory factor analyses as well as item response theory analyses
Face Validity and Content Validity	Thematic analyses of transcripts
2. Which non-cognitive variables are rated the lowest or have the greatest room for improvement?	Descriptive statistics
3. Are non-cognitive skills different among the different regions of Calgary and outside the city?	Multivariate analyses of variance and item response theory analyses

Trustworthiness and Reliability

We examined the reliability (i.e., internal consistency) of the Student Voice Survey using coefficient alpha (also known as Cronbach's alpha). Internal consistency indicates whether the items presented within the same subscale consistently measure the target construct. Furthermore, we sought the trustworthiness of the qualitative data (the interviews) primarily through triangulation. Triangulation is the process of using multiple methods and data sources in the execution of a study to ensure that a rich, robust, comprehensive, and well-developed account is produced (Mathison, 1988). In the aim of assessing the validity of our pilot survey and to make it representative of students' social and emotional skills and needs, we used both surveys and interviews together to overcome the weaknesses and biases of each method. We based our changes to the survey on the reliability of survey items and the ideas that students voiced to us in the interviews. To attain confirmability, that is, a degree of neutrality, or the

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extent to which the findings of the study are shaped by the respondents and not the researcher's bias (Cohen & Crabtree, 2006), the transcribed interviews were analyzed through NVivo and participant ideas were classified into themes. Emerging themes across transcripts were used to update our survey.

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Findings

The results presented in this section were guided by the three research questions presented in Table 2.

RQ1: Does the Student Voice survey exhibit strong psychometric properties for each subscale and as a whole instrument?

To answer this question, we investigated the following psychometric properties using the data collected on the pilot version of the Student Voice survey: reliability, construct validity, and face and content validity. To assess reliability, we computed a coefficient alpha value for each subscale. Within a range of 0 to 1, coefficient alpha provides an overall assessment of a measure's internal consistency. Coefficient alpha values closer to 1 indicate that the items within each subscale are closely related to each other, suggesting that they can measure the target construct consistently (Gravetter & Wallnau, 2008). The coefficient alpha values from the Student Voice survey ranged between 0.50 and 0.85, indicating good reliability for most of the subscales while some scales did not indicate sufficient internal consistency.

To assess construct validity, we performed exploratory factor analysis (EFA) with an oblique rotation, confirmatory factor analysis (CFA), and item response theory (IRT) analyses. First, we conducted EFA for elementary and secondary school students using half of each school sample. EFA is a multivariate statistical technique used to investigate the underlying factor structure and the relation between the observed variables and latent constructs, i.e., factors. EFA is typically considered as a data-reduction technique. As a data-driven approach, EFA helps disentangle the shared and unique variances among the observed variables and factors, and test the dimensionality of the scales (Bryant & Yarnold, 1995). We evaluated factor loadings

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and fit indices to determine whether the subscales derived from the Student Voice survey were unidimensional (i.e., measuring a single construct), and whether they were congruent with our theoretical understanding of the SEL constructs measured by the instrument. We revised the subscales based on fit indices, coefficient alpha, dimensionality, and factor loadings. Also, we removed the items that did not seem to contribute to any of the subscales. In addition, we removed one item ("I accept people who are different from me") from the Social Competence subscale because the item did not contribute to the subscale specifically designed for secondary school students. The subscales of the Student Voice survey were identified based on statistical properties and theoretical relationships between the items and target constructs. The items that were not retained following EFA could not be grouped within the other subscales or grouped, and thus, could only be analysed individually.

Following EFA, we ran CFA on the second half of the data to evaluate and confirm the psychometric properties of the subscales and gather construct validity evidence (see Table 3). One piece of evidence for the construct validity is to examine relationships among the factors. The purpose of CFA is to evaluate whether the factor structure identified in EFA works in a new sample (Harrington, 2009). We used the other split of the samples (i.e., split-half samples) of elementary and secondary students because it is important to conduct EFA on one dataset and confirm the model (i.e., CFA) using another set of data. We investigated whether the theoretical relationships between the factors were consistent with the statistical and empirical findings. Together, EFA and CFA, provided validity evidence to support construct validity of our survey, with all four model fit indices, standardized root mean residual (SRMR), root mean square error of approximation (RMSEA), Tucker-Lewis Index (TLI), Confirmatory Fit Index (CFI)

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within the acceptable range, thus indicating good model fit. In that respect, CFI and TLI values greater than .90 as well as SRMR and RMSEA values smaller than .08 indicated acceptable model fit (Kline, 1998).

Table 3

Model-Data Fit of Whole Model and Subscales following Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA)

	Elementary (*n* = 5948)				Secondary (*n* = 8872)			
	SRMR	RMSEA	TLI	CFI	SRMR	RMSEA	TLI	CFI
Whole Model	**0.03**	**0.02**	**0.99**	**0.99**	**0.04**	**0.03**	**0.98**	**0.98**
Championing	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Instructional Practice	0.01	0.00	1.00	1.00	0.02	0.02	1.00	1.00
Student Success	0.01	0.00	1.00	1.00	0.01	0.02	1.00	1.00
Student Wellness	0.01	0.02	1.00	1.00	0.02	0.04	0.99	1.00
Empowerment and Resilience	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Social Competence	0.03	0.03	0.98	0.99	0.03	0.04	0.98	0.99
Emotional/Physical Safe Environment	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00

Note. SRMR = Standardized root mean residual, RMSEA = root mean square error of approximation, TLI = Tucker-Lewis Index, CFI = Confirmatory Fit Index.

Finally, IRT was used to help explain the relationship between latent constructs and observed responses for each subscale. The IRT framework allows researchers to link individual performance or ability levels to each item on a scale by placing them on the same latent trait continuum. The main purpose of IRT is to establish each individual's and item's position with regard to the target construct. IRT allowed us to evaluate the performance of each item and the subscales derived from the Student Voice survey (Reise et al., 2005). The items in each subscale were analyzed separately to evaluate whether they contributed to the subscale sufficiently. IRT analyses indicated that all items in each subscale worked well and contributed to an acceptable

range of RMSEA. IRT graphs per subscale for both elementary and secondary groups can be found in Appendix C.

Face and content validity were studied through the thematic analysis of the interview transcripts that were performed during the pilot study. After creating our survey items based on the literature review, the interviews with the students provided us with a better understanding of students' perceptions and perspectives on the survey, and their thoughts and perspectives regarding what should be asked under each subscale of the survey. Content validity was confirmed through the literature review which supports the subscales we had chosen to represent the non-cognitive variables. Furthermore, the investigation of construct validity through CFA provided us with the best subscales to use and their respective items, aligning with the literature.

To assess face validity, interview transcripts were analyzed in the NVivo software program to examine emerging themes across the data. When asked whether the Student Voice survey captured their view of the non-cognitive skills, most students agreed that the instrument captured the important aspects of socio-emotional well-being. We also asked students specific questions about how they would define the non-cognitive skills of interest, and their answers indicated that we had successfully defined and reflected on those variables in terms that were understandable to students. For example, the themes that emerged from students' definitions of empowerment and engagement are displayed in Table 4. Based on students' input, being acknowledged as one of the main motives for them to feel empowered. As such, we added an item to represent this aspect in the survey.

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Table 4

Emerging Themes from Students' Definitions of Engagement and Empowerment

Empowerment	Engagement
Belonging/fitting in	Attendance
Feeling good	Being focused
Focusing on self strengths	Being interested
Helping others	Based on how teachers teach
Learning well	Learning well
Recognition	Listening
Social activities/group work	More doing than reading
	Participation

RQ2: Which non-cognitive skills were rated the lowest or have the greatest room for improvement?

After removing the item that EFA showed to be problematic, we ran the descriptive analysis, including frequency, mean and standard deviation for the remaining survey items. Results are presented in Table 5. The 4-point Likert-scale used for the items was: 1=*strongly disagree*, 2=*disagree*, 3=*agree,* and 4=*strongly agree*. Some items were reverse-coded (indicated in the table), meaning that agreeing with these statements indicated a lower rating of the non-cognitive skill represented by that item on the scale. The "other" section in the table includes items that were not retained after the EFA, and thus were to be individually reported descriptively.

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Table 5

Reliability and Descriptive Statistics of the Student Voice Survey (New Data)

General (*N* = 29,384)	Frequency (%)
1. What is your gender?	
Male	14183 (48%)
Female	14005 (48%)
Choose not to answer	1196 (4%)
2. What is your age range?	
8-10	7992 (27%)
11-13	11234 (38%)
14-16	7900 (27%)
17-20	2258 (8%)
3. What is your grade level?	
Grade 4	3880 (13%)
Grade 5	3958 (13%)
Grade 6	3952 (13%)
Grade 7	3833 (13%)
Grade 8	3607 (12%)
Grade 9	3152 (11%)
Grade 10	2517 (9%)
Grade 11	2249 (8%)
Grade 12	2236 (8%)
4. Were you born in Canada?	
Yes	19697 (67%)
No	9687 (33%)
5. What languages are spoken in your home?	
English	14300 (49%)
French	67 (0%)
Both English and French	734 (3%)
English and another language	11101 (38%)
French and another language	64 (0%)
English, French and another language	522 (2%)
Other	2596 (8%)
6. Does your background include First Nations, Métis or Inuit heritage?	
Yes	1713 (6%)
No	25415 (86%)
Choose not to answer	2256 (8%)

Table 5 (Cont.)

Reliability and Descriptive Statistics of the Student Voice Survey (New Data)

	Coefficient Alpha	Frequency (%)	
Faith Formation (*N* = 29384)	**0.57**	**Selected**	**Not selected**
7. I feel closer to God at school when I participate in (please select all that apply):			
Prayer/Liturgies		16197 (55%)	13187 (45%)
Religion class		13784 (47%)	15600 (53%)
Retreats		5660 (19%)	23724 (81%)
Serving/helping others		11477 (39%)	17907 (61%)
Talking with caring adults		5393 (18%)	23991 (82%)
8. I learn and grow in my faith from (please select all that apply):			
Religion class		16655 (57%)	12729 (43%)
Projects to serve/help others		9334 (32%)	20050 (68%)
Talking with teachers		4744 (16%)	24640 (84%)
Talking with friends		8396 (29%)	20988 (71%)
Going to church		14944 (51%)	14440 (49%)
	Coefficient Alpha	**Mean**	**Standard Deviation**
Championing (*N* = 29384)	**0.79**	**3.07**	**0.78**
9. There is at least one adult at my school who listens to me when I need to talk to someone.		3.12	0.89
10. There is at least one adult at my school who really cares about me.		3.11	0.89
11. There is at least one adult at my school whom I consider to be my champion.		2.98	1.00
Instructional Practice (*N* = 29384)	**0.82**	**3.14**	**0.62**
12. At the beginning of a lesson, my teachers clearly explain what I will be learning.		3.24	0.78
13. My teachers review what I learned in the previous lesson.		3.08	0.80
14. My teachers provide me with examples of what my work should look like.		3.18	0.81
15. My teachers give me regular feedback on my work.		3.06	0.81
16. Our teachers make sure we understand a topic before starting a new one.		3.11	0.88
Student Success (*N* = 29384)	**0.69**	**3.24**	**0.53**
17. I understand how I learn best.		3.23	0.80
18. I like working on class projects.		3.22	0.89
19. I continue working on tasks until I feel that I have completed it to the best of my ability.		3.19	0.76
20. I look for interesting things to learn about.		3.21	0.80
21. I mostly go to class prepared.		3.34	0.74

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Table 5 (Cont.)

Reliability and Descriptive Statistics of the Student Voice Survey (New Data)

	Coefficient Alpha	Mean	Standard Deviation
Student Wellness (*N* = 29384)	**0.77**	**2.27**	**0.81**
22. Often times I feel stressed, nervous, scared, panicked or like something bad is going to happen. (R)		2.32	1.04
23. I often worry that other students will think I am not good enough. (R)		2.43	1.10
24. I often worry that I will get poor grades at school. (R)		2.05	1.04
25. I feel completely overwhelmed when I don't know how to solve a problem at school. (R)		2.28	1.00
Empowerment and Resilience (*N* = 29384)	**0.71**	**2.89**	**0.72**
26. I feel good about myself.		3.00	0.96
27. I can deal with disappointment in healthy ways.		2.88	0.89
28. If something doesn't go as planned, I get over it quickly.		2.79	0.88
Social Competence (*N* = 29384)	**0.74**	**3.22**	**0.53**
29. I have friends at school who I feel I can trust.		3.43	0.83
30. I express my feelings in healthy ways.		3.00	0.84
31. I stay away from the negative influences of my peers and the environment.		3.11	0.85
32. I accept people who are different from me.		3.59	0.65
33. I enjoy cooperating and collaborating with peers/classmates.		3.24	0.81
34. At my school, people care about one another.		2.96	0.87
Emotional/Physical Safe Environment (*N* = 29384)	**0.81**	**3.06**	**0.80**
35. I feel accepted just as I am at my school.		3.08	0.87
36. I usually feel accepted by other students.		3.04	0.86

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Table 5 (Cont.)

Reliability and Descriptive Statistics of the Student Voice Survey (New Data)

Other (*N* = 29384)	**Coefficient Alpha**	**Mean**	**Standard Deviation**
37. My teacher gives me opportunities to redo tests, quizzes and assignments.	-	2.84	0.96
38. I am able to use my gifts and talents to the best of my abilities.	-	3.12	0.86
39. At my school, I am able to choose how I want to show my learning.	-	2.87	0.89
40. When I need help, I ask for it from my peers or teachers at school.	-	3.23	0.82
41. I participate in class discussions.	-		
42. I participate in extra-curricular activities in my school	-	3.03	0.84
43. I often have sleep difficulties (e.g., being awake at night, wanting to sleep during the day, and difficulty falling asleep or staying asleep). (R)	-	2.33	1.11
44. During this school year, I have been bullied in person or online through social media, e-mail, chat rooms, instant messaging, websites or texting. (R)	-	3.30	0.98
45. During this school year, I have mistreated a friend or another student. (R)	-	3.08	0.95
46. I spend many hours studying or doing homework outside of school.	-	2.68	0.92
47. Things I learn at school are useful.	-	3.00	0.93
48. When I finish high school, I am planning to attend college or university.[+] **(*n* = 7370)**	-	3.54	0.78
49. When I finish high school, I am planning to attend a technical school to obtain a trade or apprenticeship.[+] **(*n* = 7370)**	-	2.22	0.97
50. I get acknowledged for my good work in class.	-	2.81	0.89
51. I am sensitive to the needs and feelings of others.	-	3.05	0.87

(R) These items were reverse-coded to match our scale

[+] These items were only administered to students in Grades 7-12 (i.e., secondary students)

With respect to the Faith Formation items, students were asked whether they agree or disagree with each item. The highest percentage of students indicated feeling closer to God when participating in Prayer (55%), while the majority did not choose Retreats (19%) or Talking with Caring Adults (18%) as ways of helping them feel closer to God. In addition, the highest percentage of students indicated that they learn and grow in their faith from Religion Class (57%), while the majority of them (84%) did not think talking with teachers helped them learn and grow in their faith (see Figure 2).

In the other sections of the instrument, the highest average of responses was shown for Student Success and Social Competence, representing agreement with the items, whereas the lowest average was that of Student Wellness indicating responses closer to *disagree* on the Likert scale (see Figure 3). Students' mental wellness had the greatest room for improvement. It is interesting to note that among all items in the survey, the item that scored the lowest was "I often worry that I will get poor grades at school". This item along with other items that represent students' mental wellness, like: "I feel completely overwhelmed when I don't know how to solve a problem at school", "Often times I feel stressed, nervous, scared, panicked or like something bad is going to happen", and "I often have sleep difficulties (e.g., being awake at night, wanting to sleep during the day, and difficulty falling asleep or staying asleep)", were among the lowest-rated items in the survey. This is an important area to improve on.

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Figure 2

Bar Graph Displaying Results of Faith Formation Items in the Student Voice Survey (N = 29,384)

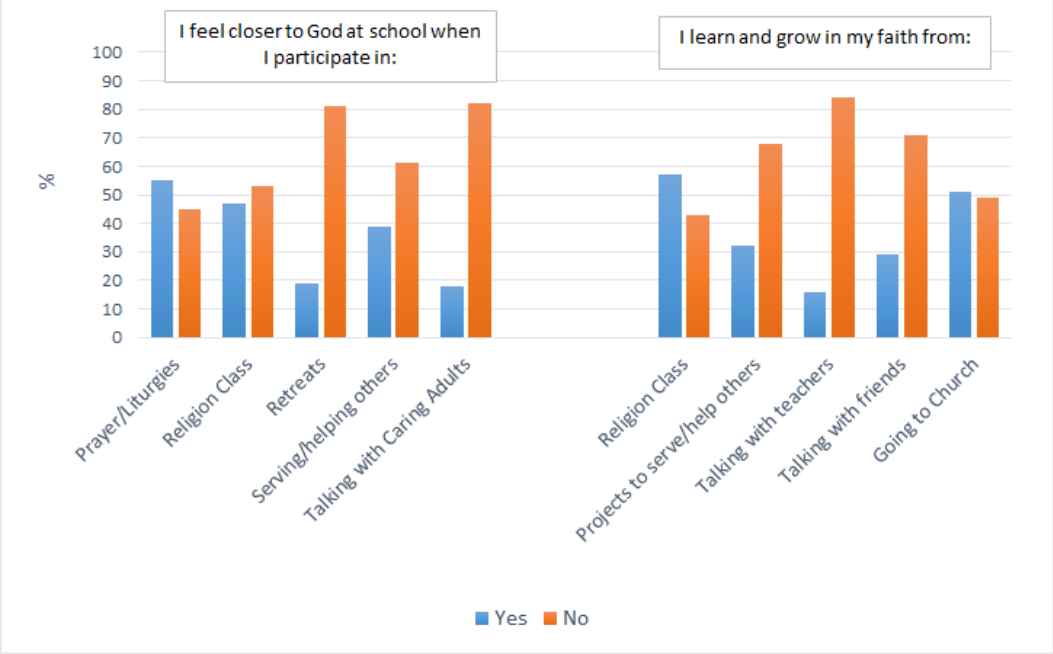
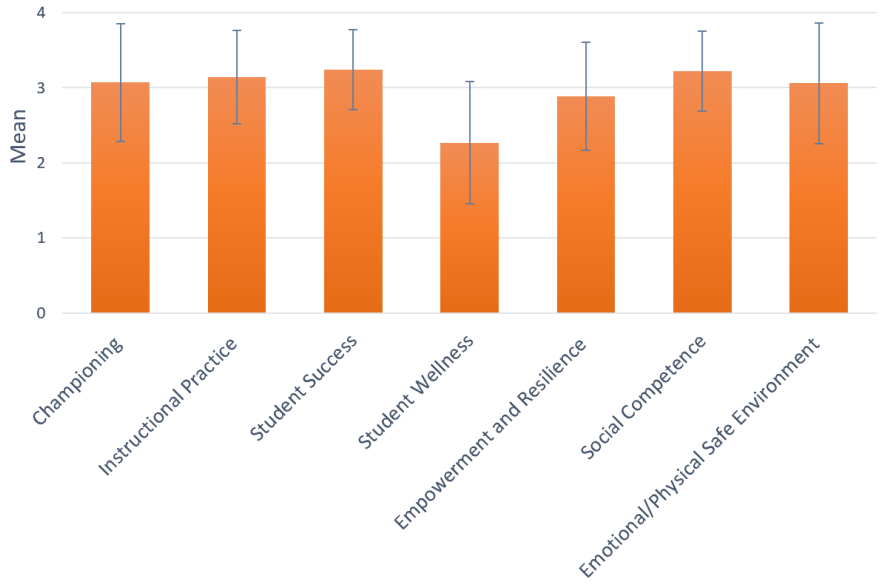


Figure 3

Bar Graph Displaying Results of Item Categories of the Student Voice Survey (N = 29,384)



RQ3: Are non-cognitive variables different among the different regions of Calgary and outside the city?

To test the difference between non-cognitive variables across different regions of Calgary (NE, NW, SE, SW) and outside the city regions (Airdrie, Chestermere, Cochrane), we performed a multivariate analysis of variance (MANOVA). These results are presented in Table 6. Results indicated a significant difference among school regions based on non-cognitive variables (i.e. survey subscale), $F(28, 117486) = 14.45$, $p < 0.05$[1] (Hotelling's Trace test). However, the partial eta-squared ($\eta^2 = 0.004$) indicates a small effect size.

Table 6

MANOVA Results Between School Region and Non-Cognitive Variables

	df	*F*
Championing	4	14.19*
Instructional Practice	4	21.89*
Student Success	4	16.32*
Student Wellness	4	6.03*
Empowerment and Resilience	4	8.24*
Social Competence	4	17.77*
Emotional/Physical Safe Environment	4	15.51*

*Statistically significant based on $p < .05$

Post-hoc testing was performed to determine exactly which mean differences were significant and which were not. The Scheffé post-hoc test was used as it is customarily used with unequal sample sizes, which was the case for the groups we were comparing. The results

[1]All 4 multivariate tests: Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root indicated the same result; however, the Hotelling's Trace test is the one reported here.

of the post-hoc test indicated the following (only statistically significantly different results reported):

- Based on the Championing subscale:
    - NW region is statistically significantly different from each of NE, SW, SE, and Airdrie/Chestermere/Cochrane regions ($p < .05$).
- Based on the Instructional Practice subscale:
    - NE region is statistically significantly different from each of NW, SW, SE, and Airdrie/Chestermere/Cochrane regions ($p < .05$).
    - NW and SE regions are statistically significantly different ($p < .05$).
- Based on Student Success subscale:
    - NW region is statistically significantly different from each of NE, SW, SE, and Airdrie/Chestermere/Cochrane regions ($p < .05$).
    - SW and Airdrie/Chestermere/Cochrane regions are statistically significantly different ($p<0.05$).
- Based on Student Wellness subscale:
    - NE region is statistically significantly different from both NW and SE regions ($p < .05$).
- Based on the Empowerment and Resilience subscale:
    - Airdrie/Chestermere/Cochrane regions are statistically significantly different from each of NE, NW, SE, and SW regions ($p<0.05$).
    - NW region is statistically significantly different from both NE and SE regions ($p < .05$).

- Based on the Social Competence subscale:
    - Airdrie/Chestermere/Cochrane regions are statistically significantly different from each of NE, NW, SE, and SW regions (p<0.05).
    - NE region is statistically significantly different from both NW and SW regions (p < .05).
    - NW region is statistically significantly different from SE regions (p < .05).
- Based on the Emotional/Physical Safe Environment subscale:
    - Airdrie/Chestermere/Cochrane regions are statistically significantly different from each of NE, NW, SE, and SW regions (p < .05).
    - SW region is statistically significantly different from each of NE, NW, SE, and Airdrie/Chestermere/Cochrane regions (p < .05).

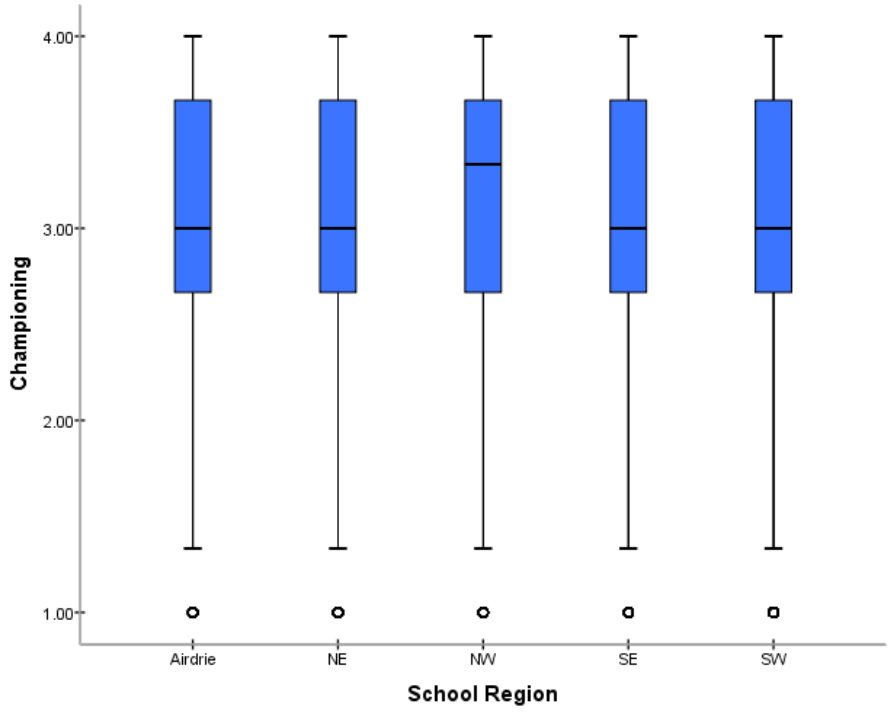
The boxplots showing the distribution of each subscale for the school regions are presented in Figures 4 to 10. The line in the middle of the box in each boxplot represents the median or the 50th percentile of the responses. As can be seen in Figure 4, the median value was larger for the NW region compared with the other four regions. The line at the bottom of the box of the boxplot represents the 25th percentile or the first quartile of the responses and the line at the top of the box of the boxplot represents the 75th percentile or the third quartile of the responses. The range between the 25th percentile and the 75th percentile of the boxplot is the interquartile range. The height of the boxplot shows the maximum and minimum values. Furthermore, the dots show mild outliers (i.e., data points lying between 1.5 times and 3 times

the interquartile range) whereas asterisks show extreme outliers (i.e., data points lying more than three times the interquartile range).

In Figure 4, the height of the five boxplots for the Championing subscale and their interquartile ranges were relatively similar across the five school regions. Interestingly, the median line for the NW region was higher than in the other four regions. This finding indicates that students in the NW region rated championing higher on the scale than the rest of the regions.

Figure 4

The Comparison of the School Regions on the Championing Subscale

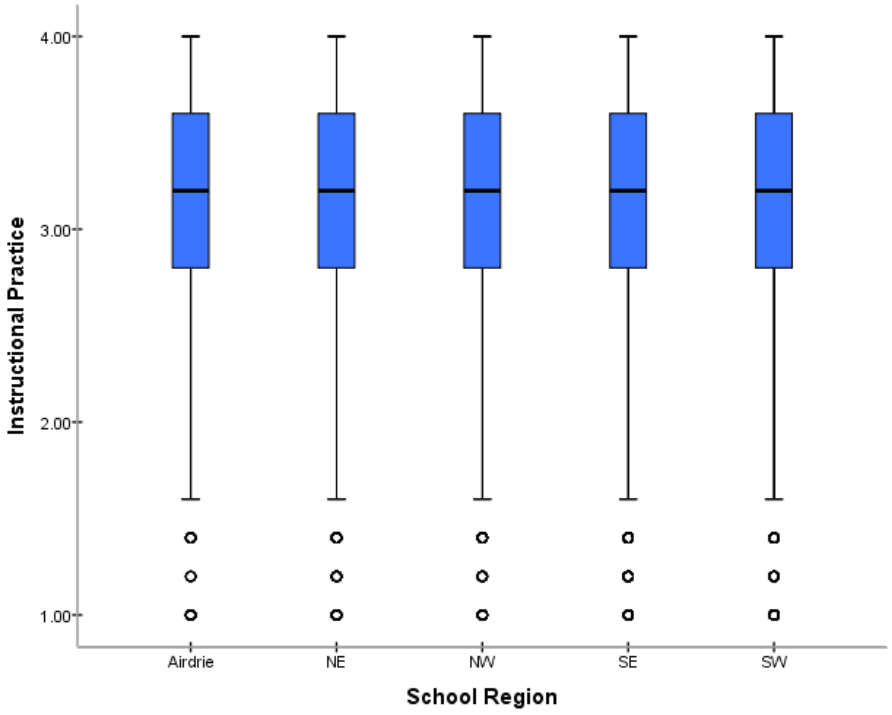


As can be seen in Figure 5, the visual analysis of the boxplot for the Instructional Practice subscale indicated that the distribution of item responses based on the interquartile

range and median values were very similar across the five school regions. In addition, the median value of responses was quite high for all of the regions, suggesting that students from all of the regions mostly agreed or strongly disagreed with the statements in the Instructional Practice Subscale. As with the Championing subscale, we observed a few outliers for all of the school regions.

Figure 5

The Comparison of the School Regions on the Instructional Practice Subscale



The visual analysis of the boxplot for the Student Success subscale (see Figure 6) showed that the median value varied across the five school regions; however, we observed that the interquartile range (indicated by the height of boxplots) was very similar across the school regions. Also, compared with the Championing and Instructional Practice subscales, the Student

Success Subscale indicated a narrower range, suggesting that the consensus among student responses was stronger in this particular scale. Furthermore, we also observed both mild and extreme outliers across all the school regions for the Student Success Subscale.

Figure 6

The Comparison of the School Regions on the Student Success Subscale

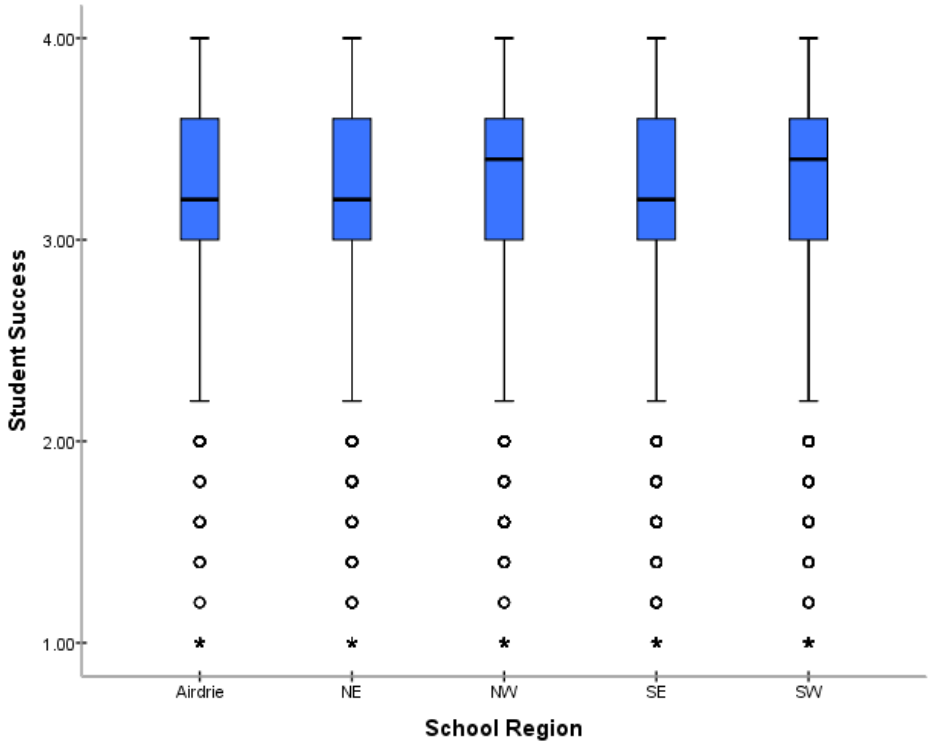


Figure 7 shows the boxplot of the Student Wellness subscale across the five school regions. Although the median values were very similar across the school regions, the interquartile range values varied, suggesting a larger variation in the responses to this subscale across the five school regions. However, the visual analysis of the boxplot showed that the minimum and maximum values were similar across the school regions. This finding implies that student responses to the Student Wellness subscale varied significantly, regardless of the

school region. Another interesting finding is that the median values for the Student Wellness subscale appeared to be substantially lower than those for the other subscales, indicating that this is a non-cognitive skill that requires further improvement in the schools.

Figure 7

The Comparison of the School Regions on the Student Wellness Subscale

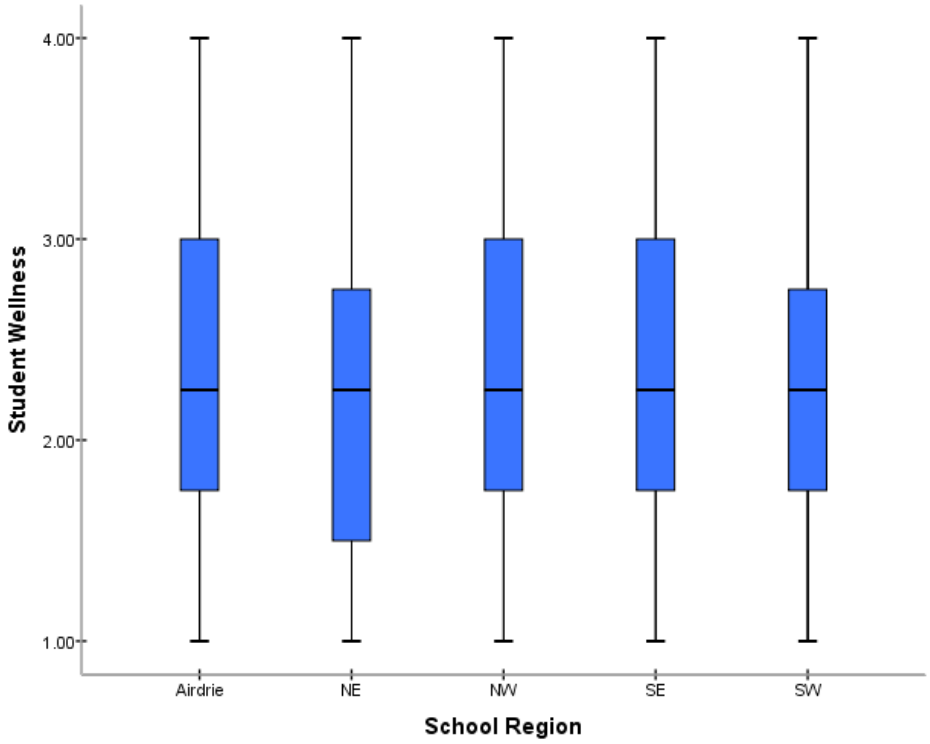
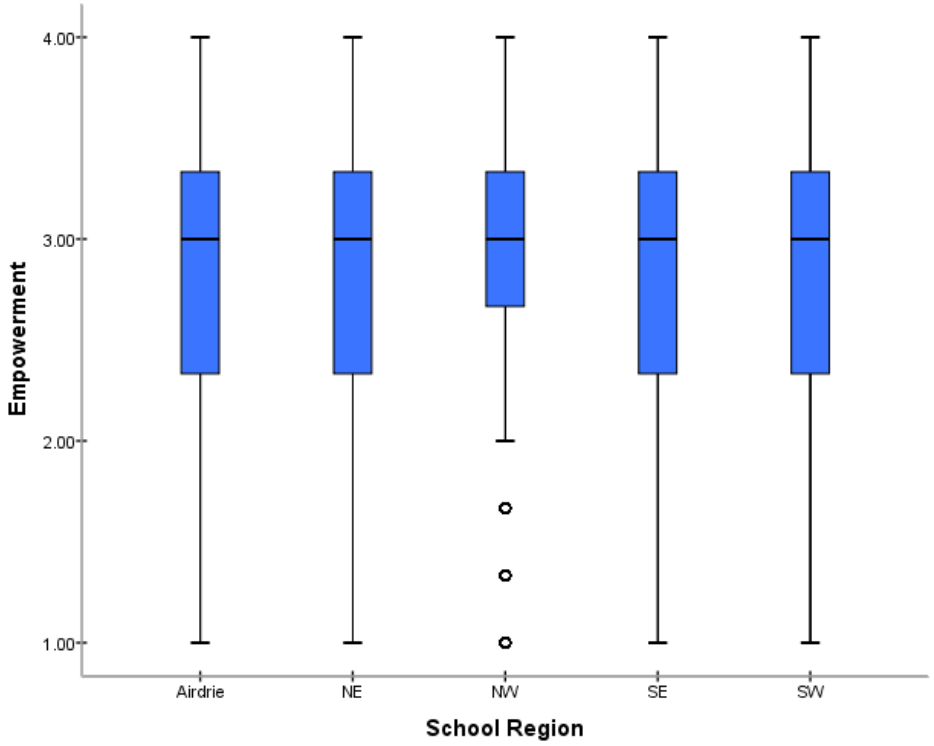


Figure 8 shows the boxplot of the Empowerment subscale across the five school regions of CCSD. The visual analysis of the Empowerment subscale boxplot showed that, except for the NW region, the interquartile range was similar across the regions. Student responses in the NW region indicated lower variation, suggesting that students might have responded quite similarly to the items in the Empowerment subscale, while there appear to be a few outliers in the responses. Despite the differences in the interquartile range, we observed that the median value of responses was similar across all of the school regions.

Classification: Protected A

Figure 8

The Comparison of the School Regions on the Empowerment Subscale

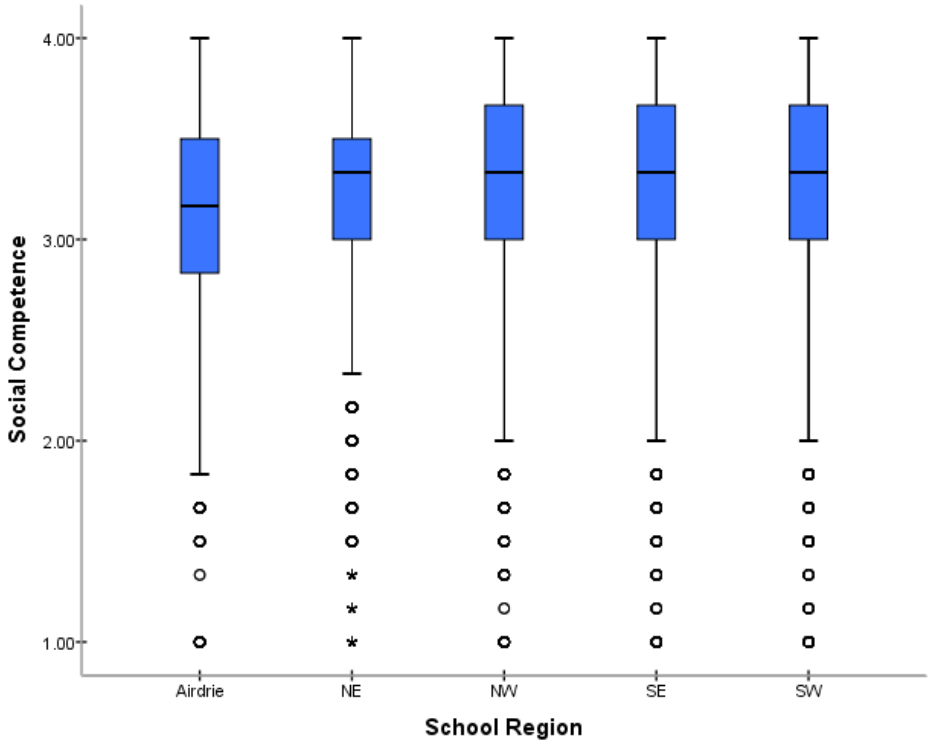


For the Social Competence subscale (see Figure 9), the median values for the four school regions (i.e., NW, SE, SW, and NE) were similar and larger than the median value for the Airdrie region. The interquartile range also varied across the regions. Furthermore, mild outliers were detected for all regions and extreme outliers were observed for the NE region. This is an interesting finding because, despite the moderate consensus on the responses given to this particular subscale, several students from each region selected the lowest response option (i.e., strongly disagree) for several items on the subscale.

Classification: Protected A

Figure 9

The Comparison of the School Regions on the Social Competence Subscale

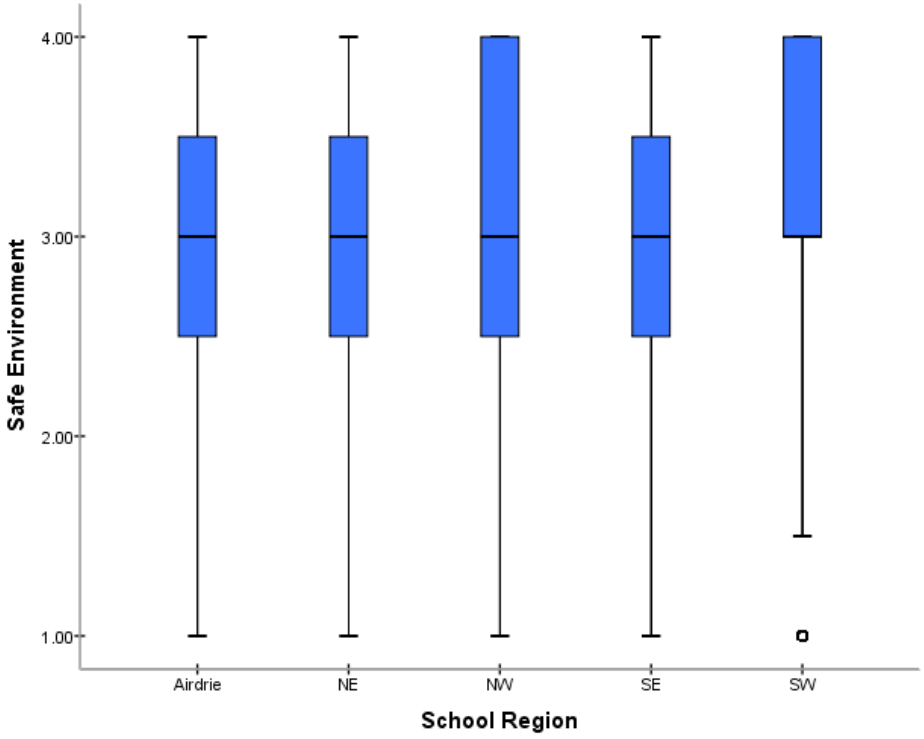


Lastly, Figure 10 shows the boxplot of the Empowerment subscale across the five school regions. The figure shows that the median values were similar across the school regions. Interestingly, the median value was identical to the first quartile (i.e., the 25th percentile) for the SW region, which is why they overlap. This finding indicates that there was a large portion of students who selected the low response options (i.e., strongly disagree or agree) in the items of this particular subscale. Furthermore, the 75th percentile and the upper limit of the responses were the same value for the NW region. For Airdrie, NE, and SE regions, the height of the boxplot and the interquartile range were similar. In the context of the Emotional/Physical Safe Environment, there is room for improvement in the NW and SW regions.

Classification: Protected A

Figure 10

The Comparison of the School Regions on the Emotional/Physical Safe Environment Subscale.



Discussion and Conclusions

Discussion of Findings

Academic success is important, but it should not be the only focus of educational systems. Previous research has highlighted the importance of social and emotional skills in children's development and academic achievement. The Student Voice Survey aimed to examine the levels of social and emotional skills in schools in Calgary and the surrounding regions. Our analyses showed that the instrument is psychometrically strong and provided evidence for reliability, construct validity, face validity, and content validity, and thus overall demonstrating the reliability and trustworthiness of the findings.

With Student Wellness being rated the lowest among the social and emotional variables represented in the instrument, it is of great importance that this is considered in the design of educational programs and learning environments. Schools and teachers have an important role in promoting students' mental health and social skill development in general. Based on survey results, students seem to worry the most about getting poor grades in school, and this is contributing to their low mental wellness. The majority also indicated feeling completely overwhelmed when they do not know how to solve a problem at school. It thus seems that academic achievement is most heavily focused on in school and is presented as the primary determinant of a student's success. In fact, the World Health Organization 2015 report on mental health states that the incidence of mental health problems with children has been increasing rapidly, one of the reasons being the increasing pressure to "excel" in academics to secure a stable job (Duraiappah, 2019). On the other hand, research has been increasingly demonstrating how Social and Emotional Learning (SEL) interventions have had positive

impacts on success in school (Duraiappah, 2019), and in parallel, brain research is showing that brain networks for cognition, emotion, and social functioning are connected and also malleable across the lifespan (Immordino-Yang et al., 2019). This means that improving the mental health of students through developing strong social and emotional skills would result in improved cognition and overall academic success. So, it is essential that the focus of schools shifts towards the mental wellbeing of students, rather than grades and academic achievement as the foremost outcome. Furthermore, Empowerment and Resilience were rated the second-lowest subscale following Student Wellness, and thus it could be another area of skills requiring further promotion.

When comparing across school regions in terms of social and emotional variables, it was evident that there were differences between them, yet with a low effect. The significant differences could be due to the very large sample size; however, it is still worth noting that there may be differences in the levels of social and emotional skills in those school regions. The subscales showing the lowest number of differences across school regions were Championing and Student Wellness. In terms of the Championing subscale, the NW region of Calgary was shown to be statistically significantly different from all other participating regions, while on Student Wellness, the NE region was shown to be statistically significantly different from the NW and SE regions. These two variables may be the most consistent across schools in Calgary and surrounding areas. Nevertheless, it is important to note that while school educational systems may place more emphasis on certain skills than others, this is not to say that schools of a specific region were performing better than those of other regions based on this criterion. Further research would be required for more detailed findings in this area.

Classification: Protected A

Potential Scholarly and Education System Benefits

This work serves primarily to inform Calgary Catholic School District on the levels of non-cognitive variables amongst students in Calgary. The results, if taken into account, could be a helpful guide for leaders in this school district to improve on certain areas of students' social and emotional learning experiences and design learning environments in ways that promote students' growth in those areas. In addition, other school authorities could benefit from these results and translate them into their educational systems. However, it would be more useful if these schools replicated survey administration in their schools to obtain more accurate results that are specifically representative of the learning experiences of their students. The extensive literature review that informed the development of the social and emotional items of our survey may be helpful to support other school authorities and researchers who intend to develop their own instrument. They may also benefit from the methodology used to assess the psychometric properties of our survey and confirm validity and reliability.

One of the benefits of having a large team of researchers and collaborating with members directly from the school district was that we were able to design a study that directly met the needs of both worlds - academic researchers and school educators. Having a member of the school district leadership team be a partner during this research also greatly helped with logistics related to the data collection. For example, our school district partner helped the research team organize dates for our data collection and got us in touch with a contact person from each school during the data collection for our pilot study. Our school district partner was also highly instrumental in the collection of the main dataset which resulted in 29384 students' participation. Our school district partner was able to convince the other district and school

leaders to ask their students to participate in the study; as such, a large number of students completed the survey during the main study of our project.

Implications for Practice

Using the Student Voice Survey to obtain accurate measures of non-cognitive variables may allow school districts to develop programs that aim to enhance the social and emotional learning experiences of students. This in turn may improve students' future academic and social success, as strongly supported by the literature. It is also important for school districts to build the capacity to develop and administer their own non-cognitive variables surveys so that they may continue to collect information regarding students' socio-emotional wellbeing and their impact on student success both academically and socially.

Recommendations for Future Research

Since this survey has proven to be useful and psychometrically valid, future work using this survey may be executed. If schools were to use the findings of this study to make changes to their educational programs, the survey may be re-administered in the following years and results compared with previous years, to assess any change in the levels of social and emotional variables. Furthermore, survey results may be linked to school-level or student-level achievement results to make connections between social-emotional skills and academic achievement. Different school districts are encouraged to use this survey in their schools and share information with other districts on how to improve these variables.

To better understand the differences in the levels of social and emotional variables across different school regions, more specific and targeted sampling could be done to include particular regions at a time for a more detailed analysis.

Classification: Protected A

Conclusion

In this report, we examined the validity of the Student Voice Survey in measuring social and emotional variables that are essential for students' learning and wellbeing. We found that student mental wellness and empowerment are areas requiring major development. We also found that differences in the level of the variables exist between different school regions. As this survey has been deemed reliable, it is highly encouraged that other school districts use this survey to collect information on the social and emotional variables that it measures and that the different districts share information amongst each other to collaboratively improve these variables in our educational systems, and thus improving learning for all students.

References

Amidei, K., Merhaut, J., & Roberto, J. (2014). *Generations together: Caring, praying, learning, celebrating, and serving faithfully*. Lifelong Faith Associates.

Ashdown, D. M., & Bernard, M. E. (2012). Can explicit instruction in social and emotional learning skills benefit the social-emotional development, well-being, and academic achievement of young children? *Early Childhood Education Journal*, *39*(6), 397-405.

Bengtson, V. L., Harris, S., & Putney, M., N. (2017). *Families and faith: How religion is passed down across generations*. Oxford University Press.

Bernard, M. E. (2004). *The relationship of young children's social-emotional competence to their achievement and social-emotional well-being*. Paper presented at the annual research conference of the australian council for educational research, Adelaide, Australia.

Brackett, M. A., Rivers, S. E., Reyes, M. R., & Salovey, P. (2012). Enhancing academic performance and social and emotional competence with the RULER feeling words curriculum. *Learning and Individual Differences*, *22*(2), 218-224.

Brophy, J. (1986). Teacher influences on student achievement. *American Psychologist*, *41*(10), 1069-1077.

Bryan, J., & Henry, L. (2008). Strengths-based partnerships: A school-family-community partnership approach to empowering students. *Professional School Counseling*, *12*(2), 149-156.

Bryant, F. B., & Yarnold, P. R. (1995). *Principal-components analysis and exploratory and confirmatory factor analysis.* In L. G. Grimm & P. R. Yarnold (Eds.), *Reading and understanding multivariate statistics* (p. 99–136). American Psychological Association.

Calgary Catholic School District (2017). *Champions of students*. Retrieved from https://www.cssd.ab.ca/schools/msgrobrien/News/Champions%20of%20Students/Pages/default.aspx

Cohen, D. & Crabtree, B. (2006). *Qualitative research guidelines project*. Robert Wood Johnson Foundation.

Committee for Economic Development. (2004). *A new framework for assessing the benefits of early education*. Retrieved from https://www.ced.org/pdf/A-New-Framework-for-Assessing-the-Benefits-of-Early-Education.pdf

Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design* (4th ed). Sage Publications.

Damasio, A. (2001). Emotion and the human brain. In A.R. Damasio, A. Harrington, J. Kagan, B.S. McEwen, H. Moss, & R. Shaikh (Eds.), *Unity of knowledge: The convergence of natural and human science*, (pp. 101-106). The New York Academy of Sciences.

Damasio, A. (2007). How the brain creates the mind. In F. Bloom (Ed.), *Best of the brain from Scientific American,* (pp. 58-67). Dana Press.

Dimick, A. S. (2012). Student empowerment in an environmental science classroom: Toward a framework for social justice science education. *Science Education*, *96*(6), 990-1012.

DiPerna, J. C., Volpe, R. J., & Elliott, S. N. (2002). A model of academic enablers and elementary reading/language arts achievement. *School Psychology Review*, *31*(3), 298-312.

Duraiappah, A. K. (2019). 21st century skills: The need for social and emotional learning. *The Blue DOT,* Issue 10, 5. https://mgiep.unesco.org/article/21st-century-skills-the-need-for-social-and-emotional-learning

Durlak, J. A., Domitrovich, C. E., Weissberg, R. P., & Gullotta, T. P. (Eds.). (2015). *Handbook of social and emotional learning: Research and practice.* Guilford.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D. & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school based universal interventions. *Child Development, 82(1),* 405–432.

Elias, M. J. (2003). *Academic and social-emotional learning.* International Academy of Education. Elias, M. J., Zins, J. E., and Weissberg, R. P. (1997). *Promoting social and emotional learning: Guidelines for educators*. ASCD

Friedman. J., & Roehlkepartain, J. (2010). *Doing good together: 101 easy, meaningful service projects for families, schools, and communities*. Free Spirit Publishing.

Glaser, R. (1991). The maturing of the relationship between the science of learning and cognition and educational practice*. Learning and Instruction*, *1*(2), 129-144.

Goldberg, J. M., Sklad, M., Elfrink, T. R., Schreurs, K. M., Bohlmeijer, E. T., & Clarke, A. M. (2019). Effectiveness of interventions adopting a whole school approach to enhancing social and emotional development: a meta-analysis. *European Journal of Psychology of Education*, *34*(4), 755-782.

Goodman, A., Joshi, H., Nasim, B., & Tyler, C. (2015). *Social and emotional skills in childhood and their long-term effects on adult life.* Early Intervention Foundation.

Gravetter, F. J., & Wallnau, L. B. (2008). *Essentials of statistics for the behavioral sciences.* Thomson.

Greenberg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., & Elias, M. J. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *American Psychologist, 58,* 466-474.

Greeno, J. G., Collins, A. M., & Resnick, L. B. (1996). Cognition and learning. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational psychology* (pp. 15-46). Macmillan.

Harrington, D. (2009). *Confirmatory factor analysis*. Oxford University Press.

Hoffman, D. M. (2009). Reflecting on social emotional learning: A critical perspective on trends in the United States. *Review of Educational Research, 79(2),* 533-556.

Houser, M. L., & Frymier, A. B. (2009). The role of student characteristics and teacher behaviors in students' learner empowerment. *Communication Education*, *58*(1), 35-53.

Immordino-Yang, M. H., Darling-Hammond, L., & Krone, C. (2019). The brain basis for social-emotional learning also supports academic learning. *The Blue DOT,* Issue 10, 47-51. https://mgiep.unesco.org/article/the-brain-basis-for-social-emotional-learning-also-supports-academic-learning

Jones, S. M., & Bouffard, S. M. (2012). Social and emotional learning in schools: From programs to strategies and commentaries. *Social Policy Report*, *26*(4), 1-33.

Juvonen, J. (2006). Sense of belonging, social bonds, and school functioning. In P. A. Alexander & P. H. Winne (Eds.), *Handbook of educational psychology* (p. 655–674). Lawrence Erlbaum Associates Publishers.

Kline, R. (1998). *Principles and practice of structural equation modeling.* The Guilford Press.

Kyllonen, P. C. (2016). Socio-emotional and self-management variables in learning and assessment. In A.A. Rupp & J.P. Leighton (Eds.), *Handbook of cognition and assessment* (pp. 174-197). Wiley.

Lee, J., & Shute, V. J. (2009). *The influence of noncognitive domains on academic achievement in K-12* (Report No. ETS RR-09-34). Educational Testing Services.

Mathison, S. (1988). Why triangulate? *Educational Researcher, 17*(2)*,* 13-17.

Martinson, R., Black, W., & Roberto, J. (2010). *The spirit and culture of youth ministry.* EYM Publishing.

Neifert, M. (2011). *Faith development in children: How to instil spiritual beliefs*.

Nelson, G., Westhues, A., & MacLeod, J. (2003). A meta-analysis of longitudinal research on preschool prevention programs for children. *Prevention & Treatment*, *6*(31), 1-35. Organisation for Economic Co-operation and Development. (2015). *Skills for social progress: The power of social and emotional skills*. OECD Publishing.

Parlakian, R. (2003). *Before the ABCs: Promoting school readiness in infants and toddlers.* Zero To Three.

Payton, J., Weissberg, R. P., Durlak, J. A., Dymnicki, A. B., Taylor, R. D., Schellinger, K. B., & Pachan, M. (2008). The positive impact of social and emotional learning for kindergarten

to eighth-grade students: Findings from three scientific reviews. Technical Report. *Collaborative for Academic, Social, and Emotional Learning* (NJ1).

Pekrun, R., & Linnenbrink-Garcia, L. (2012). Academic emotions and student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (p. 259–282). Springer Science + Business Media. https://doi.org/10.1007/978-1-4614-2018-7_12.

Pellegrino, J. W., & Hilton, M. L. (Eds.). (2012). *Education for life and work: Developing transferable knowledge and skills in the 21st century.* The National Academies Press.

Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. American Psychological Association.

Reise, S. P., Ainsworth, A. T., & Haviland, M. G. (2005). Item response theory: Fundamentals, applications, and promise in psychological research. *Current Directions in Psychological Science*, *14*(2), 95-101.

Salomon, G. (Ed.). (1997). *Distributed cognitions: Psychological and educational considerations*. Cambridge University Press.

Salovey, P. E., & Sluyter, D. J. (1997). *Emotional development and emotional intelligence: Educational implications*. Basic Books.

Shonkoff, J. P., & Phillips, D. A. (2000). *From neurons to neighborhoods: The science of early childhood development.* National Academies Press.

Smith, C., & Snell, P. (2010). *Souls in transition: The religious and spiritual lives of emerging adults.* Oxford Press.

Wang, M. T., & Degol, J. (2014). Staying engaged: Knowledge and research needs in student engagement. *Child Development Perspectives*, *8*(3), 137-143.

Wang, M. T., & Eccles, J. S. (2012a). Adolescent behavioral, emotional, and cognitive engagement trajectories in school and their differential relations to educational success. *Journal of Research on Adolescence, 22*(1), 31-39.

Wang, M. T., & Eccles, J. S. (2012b). Social support matters: Longitudinal effects of social support on three dimensions of school engagement from middle to high school. *Child Development*, *83*(3), 877-895.

Wentzel, K. R. (1991). Social competence at school: Relation between social responsibility and academic achievement. *Review of Educational Research*, *61*(1), 1-24.

Zepke, N., & Leach, L. (2010). Improving student engagement: Ten proposals for action. *Active Learning in Higher Education*, *11*(3), 167-177.

Zins, J. E., Weissberg, R. P., Wang, M. C., & Walberg. H. J. (Eds.). (2004). *Building academic success on social and emotional learning: What does the research say?* Teachers College Press.

Appendices

Appendix A: Pilot and Main Survey Items

Items in red have been changed or moved to a different subscale in the main survey.

Items in blue have been deleted from the pilot survey.

Items in green have been added to the main survey.

Pilot Study	Main Study
Faith Formation	**Faith Formation**
What experiences at school help you the most in feeling closer to God? [Prayer]	I feel closer to God at school when I participate in (please select all that apply): Prayer/Liturgies
What experiences at school help you the most in feeling closer to God? [Religion class]	Religion class
What experiences at school help you the most in feeling closer to God? [Serving/helping others]	Serving/helping others
What experiences at school help you the most in feeling closer to God? [Having a champion]	Retreats
What experiences at school help you the most in feeling closer to God? [Feeling welcomed and loved at school]	Talking with caring adults
I learn the most about what the Catholic faith teaches by: [Talking with teachers]	I learn and grow in my faith from (please select all that apply): Talking with teachers
I learn the most about what the Catholic faith teaches by: [Talking with friends]	Talking with friends
I learn the most about what the Catholic faith teaches by: [Talking with parents]	Projects to serve/help others
I learn the most about what the Catholic faith teaches by: [Engaging in religion class]	Religion class
I learn the most about what the Catholic faith teaches by: [Going to church]	Going to church
Championing	**Championing**
There is at least one adult at my school who listens to me when I want to talk to someone.	There is at least one adult at my school who listens to me when I need to talk to someone.
There is at least one adult at my school who really cares about me.	There is at least one adult at my school who really cares about me.
There is at least one adult at my school who I consider to be my champion.	There is at least one adult at my school whom I consider to be my champion.
Instructional Practice	**Instructional Practice**
At the beginning of a lesson, my teachers clearly explain what I will be learning.	At the beginning of a lesson, my teachers clearly explain what I will be learning.

My teachers review what I learned in the previous lesson. My teachers provide me with examples of what my work should look like. My teachers give me regular feedback on my work. Out teachers make sure we understand a topic before starting a new one.	My teachers review what I learned in the previous lesson. My teachers provide me with examples of what my work should look like. My teachers give me regular feedback on my work. Our teachers make sure we understand a topic before starting a new one.
Student Success	**Student Success**
I am able to use my gifts and talents to the best of my abilities.	I like working on class projects.
At my school, I am able to choose how I want to show my learning.	I continue working on tasks until I feel that I have completed it to the best of my ability.
I am allowed to use a cell phone or personal device for learning purposes in school.	I look for interesting things to learn about.
I understand how I learn best. ---	I understand how I learn best. I mostly go to class prepared.
Engagement	
When I need help, I ask for it from my peers or teachers at school.	---
I participate in class discussions.	---
I like working on class projects.	---
I continue working on tasks until I feel that I have completed it to the best of my ability.	---
I participate in extra-curricular activities I my school.	---
Student Wellness	**Student Wellness**
I often have sleep difficulties (e.g. being awake at night, wanting to sleep during the day, and difficulty falling asleep or staying asleep).	---
Often times I feel stressed, nervous, scared, panicked or like something bad is going to happen.	Often times I feel stressed, nervous, scared, panicked or like something bad is going to happen. (R)
During this school year, I have been bullied in person or online through social media, email, chat rooms, instant messaging, websites or texting.	---
During this school year, I have mistreated a friend or another student.	---
I often worry that other students will think I am not good enough.	I often worry that other students will think I am not good enough. (R)
I often worry that when I take a test, it will be difficult for me. I often worry that I will get poor grades at school.*	--- I often worry that I will get poor grades at school. (R)

I feel completely overwhelmed when I don’t know how to solve a problem at school.	I feel completely overwhelmed when I don't know how to solve a problem at school. (R)
Commitment to Learning	
If something interests me, I try to learn more about it.	---
Sometimes I go to class unprepared. Being a good student is an important part of who I am. I spend many hours studying or doing homework outside of school. How many hours a day do you spend using technology at home (i.e. cell phone, tablet, video games, computer)?	--- --- --- ---
Things I learn at school are useful. When I finish high school, I am planning to attend college or university.+ When I finish high school, I am planning to attend a technical school to obtain a trade or apprenticeship.+	--- --- ---
Outlook and Resilience	**Empowerment and Resilience**
I feel good about myself. I can deal with disappointment in healthy ways. If something doesn’t go as planned, I get over it quickly.	I feel good about myself. I can deal with disappointment in healthy ways. If something doesn’t go as planned, I get over it quickly.
Social Competence	**Social Competence**
I have friends at school who I feel I can trust.	I have friends at school who I feel I can trust.
I express my feelings in healthy ways.	I express my feelings in healthy ways.
I stay away from the negative influences of my peers and the environment.	I stay away from the negative influences of my peers and the environment.
I accept people who are different from me.	I accept people who are different from me.
I am sensitive to the needs and feelings of others.	---
I enjoy cooperating and collaborating with peers/classmates.	I enjoy cooperating and collaborating with peers/classmates.
At my school, people care about one another.	At my school, people care about one another.
Emotional/Physical Safe Environment	**Emotional/Physical Safe Environment**
I feel accepted just as I am at my school.	I feel accepted just as I am at my school.
I usually feel accepted by other students.	I usually feel accepted by other students.
Empowerment	
Teachers provide me with the opportunity to ask questions to help with my learning.	---
Family/Community Support	
I can talk to my parents/guardians about problems I am having.	---
My parents/guardians care about me.	---

My friends care about me.	---
	Other
---	My teacher gives me opportunities to redo tests, quizzes and assignments.
---	I am able to use my gifts and talents to the best of my abilities.
---	At my school, I am able to choose how I want to show my learning.
---	When I need help, I ask for it from my peers or teachers at school.
---	I participate in class discussions.
---	I participate in extra-curricular activities in my school.
---	I often have sleep difficulties (e.g., being awake at night, wanting to sleep during the day, and difficulty falling asleep or staying asleep). (R)
---	During this school year, I have been bullied in person or online through social media, e-mail, chat rooms, instant messaging, websites or texting. (R)
---	During this school year, I have mistreated a friend or another student. (R)
---	I spend many hours studying or doing homework outside of school.
---	Things I learn at school are useful.
---	When I finish high school, I am planning to attend college or university.+
---	When I finish high school, I am planning to attend a technical school to obtain a trade or apprenticeship. +
---	I get acknowledged for my good work in class.
---	I am sensitive to the needs and feelings of others.

*This item was only administered to students in Grades 4-6 (i.e., elementary students)

+These items were only administered to students in Grades 7-12 (i.e., secondary students)

(R) These items were reverse-coded to match our scale

Appendix B: Final Survey

General
1. What is your gender? Male Female Choose not to answer 2. What is your age range? 8-10 11-13 14-16 17-20 3. What is your grade level? Grade 4 Grade 5 Grade 6 Grade 7 Grade 8 Grade 9 Grade 10 Grade 11 Grade 12 4. Were you born in Canada? Yes No 5. What languages are spoken in your home? English French Both English and French English and another language French and another language English, French and another language Other 6. Does your background include First Nations, Métis or Inuit heritage? Yes No Choose not to answer
Faith Formation
7. I feel closer to God at school when I participate in (please select all that apply): Prayer/Liturgies Religion class Retreats Serving/helping others Talking with caring adults

8. I learn and grow in my faith from (please select all that apply):
Religion class
Projects to serve/help others
Talking with teachers
Talking with friends
Going to church
Championing
9. There is at least one adult at my school who listens to me when I need to talk to someone.
10. There is at least one adult at my school who really cares about me.
11. There is at least one adult at my school whom I consider to be my champion.
Instructional Practice
12. At the beginning of a lesson, my teachers clearly explain what I will be learning.
13. My teachers review what I learned in the previous lesson.
14. My teachers provide me with examples of what my work should look like.
15. My teachers give me regular feedback on my work.
16. Our teachers make sure we understand a topic before starting a new one.
Student Success
17. I understand how I learn best.
18. I like working on class projects.
19. I continue working on tasks until I feel that I have completed it to the best of my ability.
20. I look for interesting things to learn about.
21. I mostly go to class prepared.
Student Wellness
22. Often times I feel stressed, nervous, scared, panicked or like something bad is going to happen. (R)
23. I often worry that other students will think I am not good enough. (R)
24. I often worry that I will get poor grades at school. (R)
25. I feel completely overwhelmed when I don't know how to solve a problem at school. (R)
Empowerment and Resilience
26. I feel good about myself.
27. I can deal with disappointment in healthy ways.
28. If something doesn’t go as planned, I get over it quickly.
Social Competence
29. I have friends at school who I feel I can trust.
30. I express my feelings in healthy ways.
31. I stay away from the negative influences of my peers and the environment.
32. I accept people who are different from me.
33. I enjoy cooperating and collaborating with peers/classmates.
34. At my school, people care about one another.
Emotional/Physical Safe Environment
35. I feel accepted just as I am at my school.
36. I usually feel accepted by other students.
Other
37. My teacher gives me opportunities to redo tests, quizzes and assignments.

38. I am able to use my gifts and talents to the best of my abilities.
39. At my school, I am able to choose how I want to show my learning.
40. When I need help, I ask for it from my peers or teachers at school.
41. I participate in class discussions.
42. I participate in extra-curricular activities in my school
43. I often have sleep difficulties (e.g., being awake at night, wanting to sleep during the day, and difficulty falling asleep or staying asleep). (R)
44. During this school year, I have been bullied in person or online through social media, e-mail, chat rooms, instant messaging, websites or texting. (R)
45. During this school year, I have mistreated a friend or another student. (R)
46. I spend many hours studying or doing homework outside of school.
47. Things I learn at school are useful.
48. When I finish high school, I am planning to attend college or university.[+]
49. When I finish high school, I am planning to attend a technical school to obtain a trade or apprenticeship. [+]
50. I get acknowledged for my good work in class.
51. I am sensitive to the needs and feelings of others.

(R) Require reverse-coding
[+] Items for secondary only

Appendix C: IRT Graphs Per Subscale

Figure C1

Test Information (I) and Standard Error (SE) of IRT Models for each Subscale for the Elementary School Students

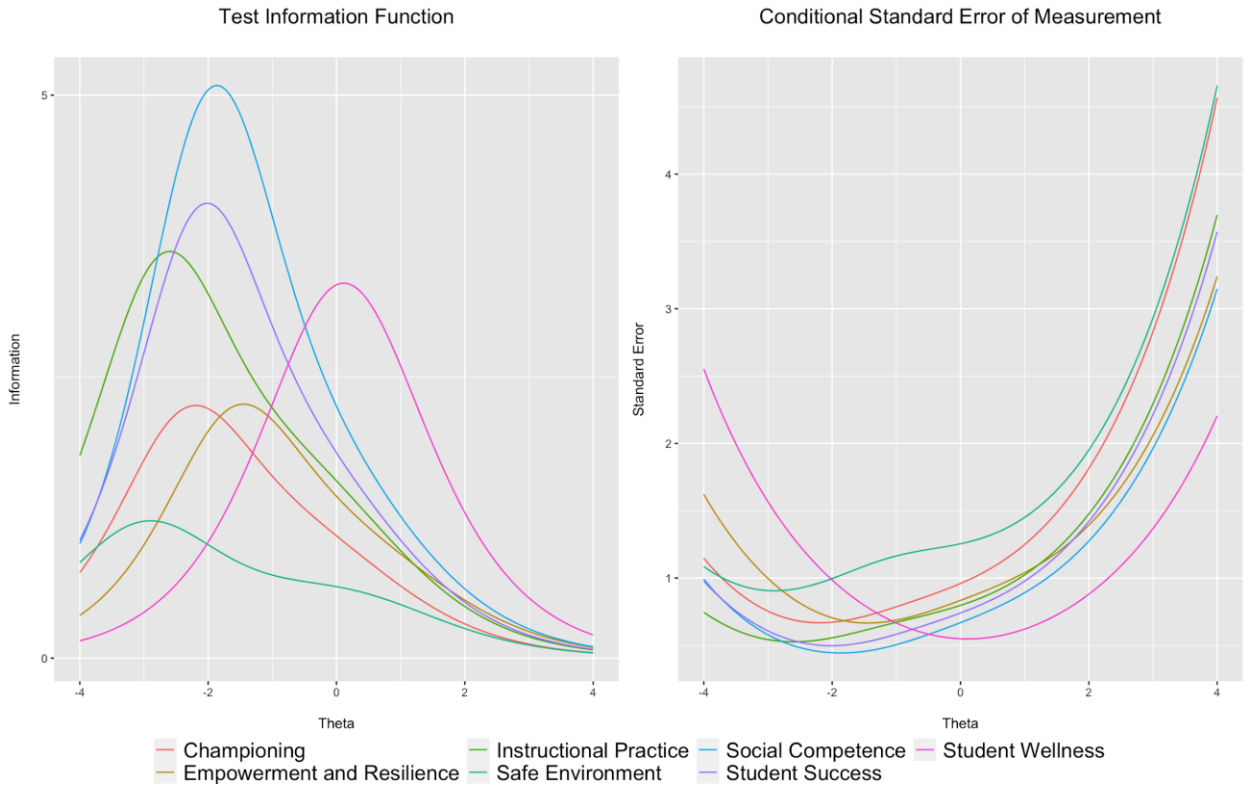
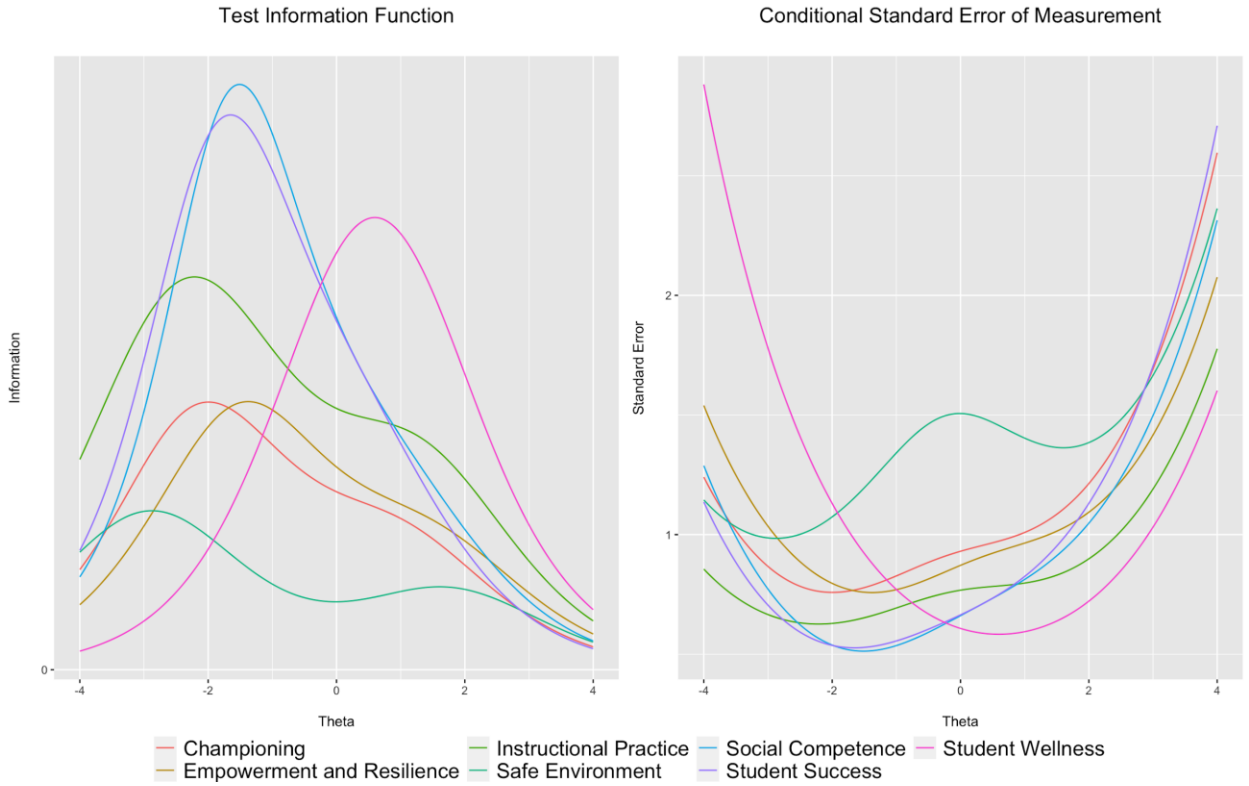


Figure C2

Test Information (I) and Standard Error (SE) of IRT Models for each Subscale for the Secondary School Student



Appendix D: Final Budget

Budget Area/Items		Cost for Each Item in Budget Area	Total Cost Allocated to Budget Area	Actual Expenditure to Date
Personnel	Two graduate students will assist with the project [~$28/hour including benefits] for the duration of the one-and-a-half year project. Each student can work up to 450 hours each year.	$37,800	**$37,800**	**$31,082.54**
Knowledge Mobilization	Travel costs for Alberta Education meetings in Edmonton to disseminate knowledge ($0.49/km×600km[2-way]×2 person[carpool]×4 meetings=$2352) during the one-and-a-half year project. A representative will attend each of the four projects. Alberta-based knowledge dissemination (*ULead*) registration and travel costs.	$2352 $418.80	**$2,770.80**	**$295.00**
Transcription Service	Transcription assistance from a University of Calgary ethics approved service will be required for the audio data collected by the research team. We estimate about 6 hours of audio recordings ($1.25/minute×60 minutes×6 hours=$450).	$450	**$450**	**$0**
Supplies and materials	Research equipment (e.g., photocopying) and additional costs for the pilot study (e.g., incentives for student participants in the pilot study)	$648	**$648**	**$793.99**
Indirect Costs of Research	University of Alberta has a 10% indirect cost for externally funded projects (10% of $41020.80= $4102.08)	$4102.08	**$4102.08**	**$3,154.76**
		Total	**$45,122.88**	**$35,323.29**

Note: An extension has been requested, and approved, for the financials of the project. This extension was needed due to the delay in the conferences at which we aimed to present our findings. However, we did not need an extension for the final report as our data collection was completed on time.

Appendix E: Research Team

Calgary Catholic School District (CCSD)

Kevin Deforge is the Supervisor of Educational Technology. He supported the Educational Technology Consultants to ensure that technology is effectively integrated by teachers and students in the district. Kevin is the lead on this project from CCSD. During this project, Kevin helped the research team develop the survey tool used to measure socio-emotional variables and provided technical support to administer the survey.

Andrea Holowka is the Superintendent of Instructional Services, and she is responsible for the development, implementation, supervision and evaluation of all district programs. As such, she is a strong supporter of this study, which provided her team with data to inform future district programs.

Daniel Danis is the Director of Instructional Services for Secondary Teaching and Learning who oversees district-wide teaching and learning practices. During this project, Daniel coordinated the schools involved with the pilot and investigative stages of the study.

Trish McCallum is the Diverse Learning First Nation, Métis, and Inuit (FNMI) consultant. She provided an FNMI perspective to our project by giving input during the survey development as well as the data analyses and interpretation phase of our project.

Stephanie Proctor, Christy Urban, and Jodie Walz are Instructional Services Consultants in Educational Technology. They provide leadership and support to ensure technology is effectively integrated within the district. During this project, they provided school administrators, teachers, students, and the research team with the technical support to administer the survey using their district's Google platform.

Classification: Protected A

University of Alberta (UofA)

Dr. Okan Bulut is an associate professor with a research focus on educational measurement, psychometrics, and survey development. Specifically, he has conducted many research projects related to the validation of claims made from surveys. Dr. Bulut's expertise in this field is nationally recognized as he taught a workshop on survey development and validation processes during the Canadian Educational Researchers' Association annual meeting. During this project, Dr. Bulut provided the measurement expertise to conduct advanced statistical analyses (e.g., item response theory) that provided high-quality evidence of validity.

St. Mary's University (SMU)

Dr. Paolina Seitz is an associate professor with a research focus on curriculum, educational assessment, and student wellbeing. Dr. Seitz has completed many projects that utilize various frameworks and surveys that measure student wellbeing (e.g., the role of trust in an emotionally safe classroom environment). During this project, Dr. Seitz helped with the literature review and item development process. She also helped with the interviews related to the content validity evidence.

University of Calgary (UofC), Werklund School of Education (WSE)

Dr. Man-Wai Chu is an assistant professor with a research focus on educational assessments and non-cognitive variables. Specifically, she investigates the use of non-cognitive variables in the classroom during various formative tasks. During this project, Dr. Chu led the development of the ethics applications (i.e., both UofA's and CCSD's ethics

board) and research resources (e.g., initiated development of survey). During the data analyses, Dr. Chu focused on the analyses related to construct validity evidence.

Classification: Protected A