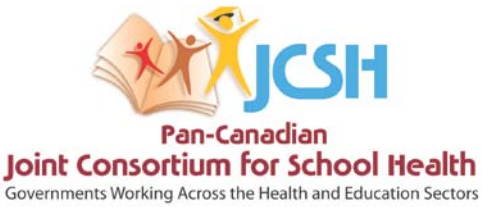
Development of the

Core Indicators and Measurements Framework

for School Health

and Student Achievement in Canada



Development of the Core Indicators and Measurements Framework for School Health and Student Achievement in Canada

Authors:

Alicia Hussain (Project Manager), Glenda Christou, Mary-Anne Reid,

John Freeman (Principal Investigator).

Social Program Evaluation Group, Queen's University

October 23, 2013

For:

Pan-Canadian Joint Consortium for School Health (JCSH)

This document is available at www.jcsh-cces.ca

Suggested citation:

Hussain, A,, Christou, G., Reid, M., & Freeman, J. (2013). *Development of the Core Indicators and Measures (CIM) Framework for school health and student achievement in Canada*. Summerside, PE: Pan-Canadian Joint Consortium for School Health (JCSH).

ABSTRACT

Comprehensive School Health (CSH) in Canada is a planned, integrated, holistic framework to improve the health of students and concurrently promote student achievement. The Pan-Canadian Joint Consortium for School Health (JCSH) is a partnership of 12 provincial and territorial governments (excluding Quebec), supported by the Public Health Agency of Canada, working together to promote the CSH framework. To further support this framework, the JCSH was interested in evaluating the impact of CSH initiatives across the country. Therefore, the goal of this project was to determine a set of Core Indicators and Measures (CIM) to measure the effectiveness of CSH initiatives in enhancing student achievement.

To accomplish this goal, we consulted three data sources: scholarly literature, grey literature, and interviews with 24 experts from across Canada. We organized the data from all three sources under three broad domains: cognitive, behavioural, and affective. This organization allowed us to identify equal numbers of studies in the literature for each domain, avoiding the possibility that we would narrow our search for indicators and measures prematurely.

Using an iterative approach moving between the literature and the analysis of the interviews, our findings revealed three broad categories of indicators supported by the data: academic, success, and environmental. Some indicators were more strongly represented in the literature, while others were relatively absent in the conceptualization of student achievement in the literature but were prominent in the voices of the interviewees.

Academic indicators (achievement test scores for cognitive, attendance for behavioural, academic motivation for affective) most closely related to academic achievement. Achievement

test scores were mentioned by all interviewees and were the most commonly used indicator in both the scholarly and the grey literature. Attendance was brought out most strongly in the grey literature focus on behaviour. Academic motivation was occasionally mentioned across all three data sources.

Success indicators (high school progression, student participation, and mental health, respectively) tended to see student achievement more holistically. High school progression was a primary focus of a few interviewees, most notably an administrator working in an alternative school setting. Student participation was mentioned by a number of interviewees and was seen as encompassing a range of participation possibilities. In the literature, student participation tended to be narrowly conceived in terms of on-task versus off-task behaviour. Mental health was the second most prominent indicator (after achievement test scores) across all data sources.

Finally, congruent with the settings approach advocated by CSH, environmental indicators were seen as demonstrating student achievement or, at the very least, as proxies for student achievement, given that student achievement requires understanding and knowledge about health-enhancing behaviours (cognitive), adult engagement (behavioural), and inclusive school environment (affective), all while recognizing the importance of social determinants. Environmental indicators seldom appeared in the research literature as an outcome of CSH.

TABLE OF CONTENTS

Core Indicators and Measures (CIM) Framework: Executive Summary

We need to prepare them [students] for their whole life, not just for a job or good academic success, but preparing them for their life.

Context

Recognizing the lack of an evidence-based Canadian framework to understand the effects of Comprehensive School Health (CSH), in the spring of 2013, the pan-Canadian Joint Consortium for School Health (JCSH) commissioned the Social Program Evaluation Group (SPEG) at Queen's University to develop a set of Core Indicators and Measures (CIM). The goal was to understand how CSH enhances student achievement. To accomplish this goal, the SPEG team, in collaboration with the JCSH, consulted three data sources: scholarly literature, grey literature, and interviews with 24 experts from across Canada (two from each JCSH jurisdiction).

Process

The development of this report went through six stages:

1. Clarification of the research objectives in light of the history of CSH efforts in Canada and elsewhere;
2. Development of an analytical lens using cognitive, behavioural, and affective domains;
3. Analysis of recent scholarly literature (2000-2013) on CSH and student achievement;
4. Analysis of recent grey literature on CSH and student achievement;
5. Analysis of interviews SPEG team members conducted with 24 Canadian CSH experts;
6. Synthesis of the three data sources into a CIM Framework.

At each stage, SPEG and JCSH worked together to ensure that theory was informing practice and practice was informing theory.

Challenges

- Lack of literature on *comprehensive, integrated, and holistic* approaches to school health (most research studies focused on a single aspect of school health, commonly, healthy eating and physical activity);
- Lack of research in the unique Canadian context (much research was conducted in the United States);
- Lack of a broad-based understanding in the research on student achievement (researchers tended to see student achievement as individual academic achievement).

Categories of Indicators

Academic Indicators: Academic indicators most closely represent traditional views of achievement as an outcome of Comprehensive School Health initiatives. As such, academic indicators were the foremost ones reflected in the research and were consistently mentioned in the interviews.

> **Achievement Test Scores (Cognitive):** *When I hear student achievement, marks, grades, and graduation come to mind immediately. That's all.*
>
> **Attendance (Behavioural):** *If they're* [students] *not coming to school, that's the first problem, so any impediments to attendance have to be addressed.*
>
> **Academic Motivation (Affective):** *How students feel about themselves and about their work is reflected in their performance academically.*

Success Indicators: One of the key principles of Comprehensive School Health is the extension of student achievement beyond academic achievement, often referred to as student success. Success indicators recognize a more holistic view of student achievement.

> **High School Progression (Cognitive):** *Students being academically successful often entails finishing school – graduating with a diploma.*
>
> **Student Participation (Behavioural):** *That's what student achievement means to me – healthy, well-balanced students that are engaged.*
>
> **Mental Health (Affective)**: *I think of the whole person. The social and emotional well-being of these students. I think of just everything.*

Environmental Indicators: While environment can be seen as a factor of CSH rather than as a CSH achievement indicator, it is both. CSH success is dependent on altering the environment. As such, environment becomes an indicator of (or at least precursor to/proxy for) student achievement.

> **Understanding of Comprehensive School Health (Cognitive):** *You need to get people to understand what the steps in the process are.*
>
> **Adult Engagement (Behavioural):** *Superintendents, principals, RCMP, different health services type stuff, all the community.*
>
> **Inclusive School Environment (Affective):** *We are dedicated to a rich experiential environment, particularly as we want to accommodate* [diversity].

Common Indicators and Measures (CIM) Framework

	COGNITIVE	**BEHAVIOURAL**	**AFFECTIVE**
ACADEMIC INDICATORS	*Achievement test scores:* standardized tests, GPA, report cards	*Attendance:* absences, lates, suspensions/expulsions	*Academic motivation:* academic self-concept/self- efficacy, self- regulation, self-confidence, intrinsic/extrinsic motivation, coping strategies
SUCCESS INDICATORS	*High school progression*: graduation rates, graduating with Honours, credit attainment, drop- out rates, post- secondary plans	*Student participation*: number of activities in which students participate, type of participation (e.g., leadership; on-task/off-task), variety of participation (in-class, extra-curricular, community), quality of participation (student engagement, peer relationships)	*Mental health:* well-being, ill-being, suicidal tendencies, depression, school connectedness
ENVIRONMENTAL INDICATORS	*Understanding of Comprehensive School Health:* student, teacher, school administrator, parent, community	*Adult engagement:* parent and family member authentic engagement in school, teacher and administrator professional development, community partnerships	*Inclusive school environment:* safety, accepting environment, positive school culture, healthy school "buy-in"

If we use the CIM framework to judge students and schools based on the extent to which they match a standardized level on these indicators, we neglect the powerful effects of socio-environmental factors on students' lives.

Next Steps

We must expand our research into Comprehensive School Health within the Canadian context in line with the four JCSH pillars (teaching and learning; social and physical environments; healthy school policy; partnerships and services). Additionally, we must move beyond academic achievement, especially as measured by achievement test scores, to an expansive view of student achievement that encompasses academic, success, and environmental indicators within cognitive, behavioural, and affective domains. The pan-Canadian Joint Consortium for School Health is ideally situated to accomplish both these goals. How does the JCSH move forward?

- The JCSH has shown over its mandate a constant commitment to support Canadian research into Comprehensive School Health. As such, the JCSH can leverage the CIM Framework to create opportunities for research that is based on all four JCSH pillars and that moves beyond studies that focus on a singular health outcome, such as physical activity or healthy eating.
- With its connections to policymakers, practitioners, and researchers from both education and health sectors across 12 provinces and territories, the JCSH has the forum upon which to create a greater vision for Comprehensive School Health and its measurement. The JCSH needs to mobilize its pan-Canadian resources to disseminate the findings from this report. Open discussion around how we as Canadians can help our young people to thrive in the 21st century is greatly facilitated through a consortium such as JCSH.

When we show students that we care about them and not just about their results, then we create a better environment where students learn.

[Illustrative quotes in italics are taken from interviews with Canadian school health experts.]

CHAPTER 1: INTRODUCTION

The purpose of this report is to identify a set of Core Indicators and Measures (CIM) to determine the effectiveness of Comprehensive School Health (CSH) initiatives in improving student achievement through: (i) a review of scholarly and grey literature including exemplary evaluation reports of initiatives (interventions, programs, and policies) that fall under the CSH framework; (ii) interviews with 24 education and school health experts across Canada (two from each jurisdiction represented within the Pan-Canadian Joint Consortium for School Health [JCSH]); and (iii) a synthesis of the information across these sources to develop an evidence-based lens for determining what constitute core indicators and measures. This study is founded on two beliefs: (i) healthy students are better learners and better-educated individuals are healthier (Basch, 2011; JCSH, 2012; Saab, Klinger, & Shula, 2009), and (ii) it is important to have accurate and appropriate indicators and measures for the purpose of evaluating programs and strategies to improve them and ultimately improve learning and health outcomes (Clift & Jenson, 2005; Stufflebeam, 1971). These key beliefs underlie our choice of literature to report, our interview process and selection of interviewees, and the development of the final synthesis.

Since 2005, a four-pillar CSH framework has been promoted by the Pan-Canadian Joint Consortium for School Health (JCSH)—a partnership of provincial/territorial governments with support from PHAC recognizing how critical it is for the health and education sectors to collaborate in improving student health and achievement. The CSH framework recommends four key pillars for student success: (i) teaching and learning, (ii) social and physical environments, (iii) healthy school policy, and (iv) partnerships and services. To further support the four-pillar CSH framework, the JCSH is interested in evaluating the progress of CSH initiatives in terms of how the CSH approach has specifically impacted student achievement.

Conceptualization of Student Achievement within Comprehensive School Health

In 1948, the World Health Organization (WHO) broadened its definition of health by describing health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 1948). Comprehensive school health approaches are founded on the WHO's definition of health. These approaches recognize the core mission of schools as the promotion of student achievement but tend to place less emphasis on academic achievement than do curricular-based approaches to schooling. While academic achievement and student achievement are often used interchangeably, academic achievement is only one component of student achievement (Guskey, 2013; Hattie & Anderman, 2013; Veugelers & Schwartz, 2010). Additionally, academic achievement and student achievement may be related to the extent that students with high marks tend to like the content of lessons, experience improved confidence, and are more likely to engage in subsequent, related learning experiences (Creemers & Kyriakides, 2010).

CSH initiatives fall within three broad categories: (i) interventions that ideally address all CSH components in targeting specific health issues over a limited time span, such as improving food consumption or levels of physical activity, commonly aimed at the classroom or school level; (ii) initiatives that promote health more globally, such as bullying prevention programs, commonly instantiated at the school or school board level; and (iii) policies that provide directions within which interventions and programs should be situated, usually put into place at the school board or provincial/territorial level (Veugelers & Schwartz, 2010; Young, 2005).

CSH is a framework "supporting improvements in students' educational outcomes while addressing school health in a planned, integrated and holistic way" (JCSH, 2013). CSH extends beyond the classroom encompassing the whole school environment. A whole-school approach to

school health should not only influence student health but the entire school community. “The terms Health Promoting Schools (HPS) and Comprehensive School Health (CSH) reflect healthy school community frameworks that follow the WHO [World Health Organization] guidelines, and the IUHPE [International Union for Health Promotion and Education] framework, and have been used to address school health and well-being” (Bassett-Gunter, Yessis, Manske, & Stockton, 2012, p. 6; see Appendix A for provincial/territorial descriptions). Students who attend schools that subscribe to a holistic approach promoting health and well-being (encompassing physical, social-psychological, and spiritual dimensions) have higher life satisfaction, emotional status, self-reported health, and academic performance, and reduced high-risk behaviours (e.g., Lee, Cheng, Fung, & St. Leger, 2006; Stewart-Brown, 2006; Suhrcke & de Paz Nieves, 2011).

In the educational context, the term “achievement” implies the accomplishment of articulated learning goals (Barton & Coley, 2009; Guskey, 2013). Learning goals describe the desired educational accomplishments in accordance with curriculum expectations. According to Bloom’s (1984) taxonomy, learning goals can be classified into three domains: cognitive, psychomotor, and affective. This classification of learning helps emphasize a multi-faceted understanding of student achievement by focusing on multiple domains of achievement.

Bloom’s (1984) taxonomy was later revised (e.g., Anderson, Krathwohl, & Bloom, 2001; Krathwohl, 2002) to encompass research findings in the field of social cognition. This new conceptualization provided a deeper and broader understanding of learning goals, particularly in the cognitive domain (Forehand, 2005; Krathwohl, 2002). While the six categories in the cognitive domain significantly changed in terminology and sequence with each category now having sub-categories, the three domains into which learning goals (i.e., cognitive, psychomotor, affective) were classified remained the same in Bloom’s revised taxonomy (Krathwohl, 2002).

For the context of this study, we adapt Bloom's (1984), Guskey's (2013), Brown and Latham's (2002), and Barone and Eisner's (2012) typologies of learning goals that contribute to student achievement by discussing three learning domains: cognitive, behavioural, and affective. The cognitive domain entails what students know and think, the behavioural domain entails what students do, and the affective domain entails how students feel.

Cognitive learning goals (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956) refer to performance in subjects (e.g., language arts, mathematics) belonging to curriculum. Cognitive learning goals often first come to mind when thinking about the purpose of formal education (Guskey, 2013). Moreover, while some cognitive learning goals apply across more than one content area (e.g., problem solving), most are subject area specific (Guskey).

Behavioural outcome goals (Brown & Latham, 2002; Latham, Mitchell, & Dossett, 1978) refer to student learning behaviours, such as classroom participation or engagement, attendance, punctuality, and work habits. Some behaviours are disproportionately experienced by particular groups of students (e.g., English Language Learners, and racially/ethnically diverse students) who, in turn, have unique educational experiences (Allday & Yell, 2013; Bishop, 2013). For example, First Nations youth in Ontario tend to be disengaged from school and more likely to become involved with at-risk behaviours because they often lack opportunities for mentorship and developing leadership skills (Crooks, Chiodo, Thomas, & Hughes, 2009).

Affective learning goals (Krathwol, Bloom, & Masia, 1964) refer to the elements (e.g., students' attitudes, interests, beliefs) of individual students' personalities that affect the ways they learn. Affective goals "relate to the development of responsibility, consideration, empathy, respect for others, self-confidence, motivation, and self-regulation" (Guskey, 2013, p. 4).

Affective learning goals and behavioural outcome goals are as important as cognitive learning goals (Burger, Nadirova, & Keefer, 2012; Guskey, 2013; Hattie & Anderman, 2013). Measures of student achievement in these three domains tend to be moderately related, with those relations appearing to be reciprocal (Brown & Latham, 2002; Guskey, 2013). For instance, graduation rates may be an indicator of student achievement in the cognitive domain, while also being an indicator of student achievement in the affective domain as these rates relate to students' subjective states. The CSH framework supports all three domains (i.e., cognitive, behavioural, and affective) of goals identified as comprising student achievement.

As a settings-based approach, CSH recognizes that cognitive, behavioural, and affective goals are influenced by and influence numerous environmental factors:

(a) Student (e.g., the learner's health, gender, personality, attitudes brought to school; Freeman, Saab, King, & Gropp, 2011; Gill, 2013; Tayler, 2013)

(b) Home (e.g., family composition, parental occupation, socio-economic status, cultural background, geographic location; Bamgarner & Brooks-Gunn, 2013; Jeynes, 2013)

(c) Classroom (e.g., seating arrangements, instructional practices, assessment practices, classroom management; Levin & Soler, 2013; Xu, 2013)

(d) Teacher (e.g., teacher effectiveness, student-teacher relationships, teaching strategies; McEachin & Brewer, 2013; Schraw, Brownlee, & Olafson, 2013)

(e) School (e.g., geographic location, class sizes, school climate, faith-based schools, curriculum; Fenzel, 2013; Gu, 2013; Tanner, 2013; Torrance & Fidalgo, 2013)

(g) Community Partnerships and Services (e.g., school councils, volunteer involvement, cross-sector collaboration; Bassett-Gunter, Yessis, Masnke, & Stockton, 2012; Taxbock, 2009).

CHAPTER 2: REVIEW OF THE LITERATURE

"To permit a judgement to be made about the quality of the structure of health-promoting schools, their processes and outcomes" (Barnekow et al., 2006, p. 41), indicators of student achievement need to be identified. Young (2005) defines an indicator as a sign that gives a fair and accurate representation of a part of the working of a complex system and changes within it. To develop a set of Core Indicators and Measures (CIM) to determine the effectiveness of CSH initiatives in improving student achievement, two types of literature were consulted: scholarly literature and grey literature. Scholarly literature has gone through a review process before being published. The review process is intended to ensure that research reaches a certain quality standard. However, even with the advent of "on-line first before print" publications and the increasing proliferation of on-line journals, the review process delays the time between the researchers' making of the findings and the readers accessing those findings. Grey literature mitigates the time delay by omitting the review process. Thus grey literature can be timelier than scholarly literature, but the reader has more responsibility in deciding the extent to which the research meets quality standards. Therefore, a combination of scholarly and grey literature, herein represented by 60 evaluations divided equally between the two and across the three outcome domains (cognitive, behavioural, and affective), provides the best evidence for the current state of the field.

Literature Review Process

Searching for resources, describing evaluation methods, indicators of student achievement, results in evaluations, and synthesizing the resources gathered was a recursive process. It was important to frame and refine the research questions and research purpose by negotiating different viewpoints for the duration of this project. Initially, there was a meeting

attended by JCSH provincial/territorial representatives and the SPEG research team in April 2013. The meeting entailed a discussion about the research purpose, rationale, research questions and design, and recommendations of possible resources. The conversation at this meeting served as the beginning of ongoing conversations for the duration of this project that guided the literature review process, data collection process, and reporting procedure. A JCSH Research Advisory Working Group was formed to facilitate this project.

Selection of Resources

The JCSH Research Advisory Working Group recommended relevant resources to aid the SPEG research team's literature search. The SPEG research team's search-terms included: *student achievement/health in Canada (and by jurisdiction name); student achievement/health in the US/Europe, England, Finland, Sweden, France, Germany, Netherlands, Australia, New Zealand, school health and achievement; mental health program evaluations in schools (in Canada/US/Europe, England, Finland, Sweden, France, Germany, Netherlands, Australia, New Zealand); evaluations/reports/reviews of academic achievement and school health; healthy schools evaluations; student health and well-being; student health and community; student health policies/practices; physical activity in schools; school safety and student achievement; and healthy eating/food programs in schools*.

This review had the purpose of exploring evaluation processes, indicators, and measures pertaining to the relationship between holistic school health approaches and student achievement across Canada and a number of other countries. These countries were selected because they all subscribe to a formal holistic approach to school health and have cultural, social, and economic contexts similar to those in Canada. Canadian resources in the tables are identified by a small Canadian flag image. All resources were published between 2000 and 2013.

Organization of the Literature Review

Scholarly evaluations are discussed separately from grey literature. Both sections are organized into three sub-sections: cognitive, behavioural, and affective. Each section contains three types of Tables. In the scholarly research section, Appendices C, D, and E summarize 30 resources with respect to purpose of the evaluation, research method, student achievement indicators, CSH pillars addressed, learning goals addressed, key findings, strengths, and weaknesses. Tables 1, 3, and 5 provide an at-a-glance overview of the evaluation methods used in studies, allowing for comparisons. Tables 2, 4, and 6 provide an overview of the results of the interventions, programs, and policies related to student achievement found in scholarly evaluations. These three tables are organized relative to our synthesis framework outlining academic, success, and environmental indicators of cognitive, behavioural, and affective outcomes (see Chapter 4: Research Synthesis). In the grey literature section, Appendices F, G, and H summarize 30 resources with respect to purpose of the evaluation, research method, student achievement indicators, CSH pillars addressed, learning goals addressed, key findings, strengths, and weaknesses. Tables 7, 9, and 11 provide an at-a-glance overview of the evaluation methods used in studies, allowing for comparisons. Tables 8, 10, and 12 provide an overview of the results of the interventions, programs, and policies related to student achievement found in the grey literature. These three tables are similarly organized relative to our synthesis framework outlining academic, success, and environmental indicators of cognitive, behavioural, and affective outcomes (see Chapter 4: Research Synthesis).

Scholarly Evaluations Addressing the Cognitive Domain

Ten scholarly evaluations were reviewed for the cognitive domain: three from Canada (British Columbia, Nova Scotia, Quebec), two from the United States (Illinois and Missouri), one from Europe (Sweden), one from Australia, and one used international data. One Canadian evaluation (Saksvig et al., 2005) was focused on an Aboriginal population from Ontario (Sandy Lake First Nations). Two evaluations employed mixed methods (quantitative and qualitative; see Table 1). Six evaluations exclusively employed quantitative methods, while one exclusively employed qualitative methods. One study was a review synthesis that included multiple studies. All of the studies utilized data from students, with three other studies also including data from teachers, administrators, parents, and/or community organizations. The CSH pillar represented across all but one of the documents in the scholarly literature for the cognitive domain was Social and Physical Environments. Only one study included all four pillars (Rivard et al., 2011).

Table 2 displays the study results across the three domains of cognitive, behavioural, and affective. Eight of the 10 studies examined achievement test scores, the academic cognitive indicator. Five of these studies indicated a positive effect (e.g., Agamed et al., 2007; Florence et al. 2008, Keeley & Fox, 2009, Sherblom & Sherblom, 2006, Wood, 2006). The remaining three studies showed mixed results. In Castelli et al.'s (2007) research, aerobic fitness was positively associated with academic achievement (in math and reading), while strength and flexibility were not. According to Dix et al. (2011), their study results did not indicate unequivocally that KidsMatter was lifting student performance. However, schools that implemented KidsMatter properly had improved learning outcomes for students, after controlling for the influence of socioeconomic background. In the Kwak et al. (2009) study, vigorous physical activity was the only intensity level that significantly correlated with academic achievement, and only in girls. Of

the eight studies that used achievement test scores, five used longitudinal methodology (e.g. Ahamed et al. 2007, Dix et al. 2011, Kwak et al. 2009, Sherblom et al. 2006, Wood et al., 2006), while three used a cross-sectional design (e.g., Castelli et al., 2006, Florence et al., 2008, Keeley & Fox, 2009). Cross-sectional designs limit the possibility to draw explanations in terms of causality in the relationships observed, unlike longitudinal designs.

The cognitive-environmental indicator refers to the understanding and awareness of key stakeholders such as students, the community, school teachers, administrators, and parents with respect to healthy practices. Two studies focused on cognitive-environmental indicators. The study by Rivard et al., (2011) provided an opportunity to highlight different adult perspectives on the place of health in school. Generally, the pursuit of greater school-family-community collaboration was highlighted in this study. Saksvig et al. (2005) found that the Sandy Lake First Nations Diabetes Promotion Program was significantly associated with increased knowledge, dietary self-efficacy, and dietary improvements.

Only one study had an affective CIM indicator in the nature of improved mental health. Wood (2006) discussed the effect of anxiety reduction. Wood found that children's school performance and social functioning might be enhanced as a result of a reduction in children's anxiety over time. Two additional studies examined mental health as an influence on student achievement but not as an outcome. Sherblom et al. (2006) found that school climate (students' perceptions of the classroom community, their sense of well-being, and their concern for others) was strongly related to mathematics and reading proficiency. Dix et al. (2011) examined the effects of whole-school mental health promotion on literacy and numeracy.

Table 1: Methods from Scholarly Evaluations in the Cognitive Domain at a Glance

Evaluations	Ahamed et al., 2007	Castelli et al., 2007	Dix et al., 2011	Florence et al., 2008	Keeley et al., 2009	Kwak et al., 2009	Rivard et al., 2011	Saksvig et al., 2005	Sherblom et al., 2006	Wood, 2006
Quantitative methods	✔	✔	✔	✔	✖	✔	✖	✔	✔	✔
Qualitative methods	✔	✖	✔	✖	✖	✖	✔	✖	✖	✖
Review synthesis (multiple methods)	✖	✖	✖	✖	✔	✖	✖	✖	✖	✖
Sample populations:										
Students	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Teachers	✔	✖	✔	✖	✖	✖	✔	✖	✖	✖
Administrators	✖	✖	✔	✖	✖	✖	✖	✖	✖	✖
Parents	✔	✖	✔	✖	✖	✖	✔	✖	✖	✖
Community organizations	✖	✖	✖	✖	✖	✖	✔	✖	✖	✖
Results:										
Cognitive	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Behavioural	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Affective	✖	✖	✖	✖	✖	✖	✖	✖	✖	✔
CSH Pillars:										
Teaching and Learning	✔	✖	✖	✖	✖	✖	✔	✔	✖	✖
Social/Physical Environ.	✖	✔	✔	✔	✔	✔	✔	✖	✔	✔
Healthy School Policy	✔	✔	✔	✖	✖	✖	✔	✔	✖	✖
Partnerships and Services	✖	✖	✖	✖	✖	✖	✔	✖	✖	✖

Legend

✔ represents element present

✖ represents element absent

Table 2: Results from Scholarly Evaluations Focused on the Cognitive Domain

Evaluation Title	Cognitive			Behavioural			Affective		
	Academic	Success	Environ-mental	Academic	Success	Environ-mental	Academic	Success	Environ-mental
Ahamed et al., 2007	+	X	X	X	X	X	X	X	X
Castelli et al., 2007	M	X	X	X	X	X	X	X	X
Dix et al., 2011	M	X	X	X	X	X	X	X	X
Florence et al., 2008	+	X	X	X	X	X	X	X	X
Keeley & Fox, 2009	+	X	X	X	X	X	X	X	X
Kwak et al., 2009	M	X	X	X	X	X	X	X	X
Rivard et al., 2011	X	X	+	X	X	X	X	X	X
Saksvig et al., 2005	X	X	+	X	X	X	X	X	X
Sherblom, et al., 2006	+	X	X	X	X	X	X	X	X
Wood, 2006	+	X	X	X	X	X	X	+	X

Legend
+ represents positive effect
N represents neutral or negative effect
M represents mixed effect
X represents that the element was not measured

Scholarly Evaluations Addressing the Behavioural Domain

Ten scholarly evaluations were reviewed for the behavioural outcomes domain: three from Canada (Alberta, Ontario, and Quebec); three from the United States (Midwestern state, New York, and multiple states); three from Europe (two from England and one from Scotland); and one from New Zealand. Two Canadian evaluations (Baydala et al., 2009; Crooks et al., 2009) were focused on Aboriginal populations. Four evaluations employed mixed methods (see Table 3). Five evaluations only used quantitative methods, while none only used qualitative methods. One study was a review synthesis that examined multiple studies. All of the studies except Grieve (2009) utilized data from students. Two studies (Crooks et al., 2009; Flay, 2002) used data from all five stakeholder groups. Teaching and Learning was the most common CSH pillar addressed (seven studies), closely followed by Social and Physical Environment (six studies). No study included all four pillars.

Table 4 summarizes the results from the 10 studies with respect to cognitive, behavioural, and affective outcomes. Three studies used attendance (the academic behavioural indicator; see Chapter 4: Research Synthesis) to examine behaviour resulting from healthy school initiatives. Two of the studies revealed positive effects with respect to lower absenteeism rates (Crooks et al., 2009) and fewer suspensions (Lassen et al., 2006). In contrast, Ni Mhurchu et al. (2012) identified concrete measures of engagement as having almost no effect on student achievement; more specifically, the school breakfast program that was evaluated in low decile primary schools in New Zealand had no consistent significant effect on school attendance.

Six evaluations focused on student participation, the success behavioural indicator. Four studies had mixed results. Golley et al. (2010) and Storey et al. (2011) examined the effects of school food programs and practices on students' on-task and off-task behaviours, as they

pertained to learning and following instructions from teachers. Findings in both of these evaluations indicated that, while school food programs and practices can increase students' alertness, teachers need to be available to channel that energy to ensure that students stay on-task. Grieve (2009) found teachers held mixed attitudes about the effects of inclusive school practices on student classroom behaviour, while Flay's (2002) review synthesis found that, in most cases, comprehensive, long-term, school-wide interventions that involve families and communities can successfully reduce multiple problem/risky, unhealthy, and antisocial behaviours, and increase multiple positive, healthy and pro-social behaviours. We classified two studies as having negative or neutral results. Archambault et al. (2009) followed students longitudinally across secondary school in Quebec. While many adolescents remained highly engaged in high school, 1/3 reported changes, especially decreases in rule compliance (a measure of off-task behaviour). Although Baydala et al. (2009) related teacher-rated student participation (e.g., leadership) in one school designed from a positive Aboriginal cultural perspective, they provided no evidence that the school environment was related to student participation.

One study investigated the behavioural-environmental domain. Brotman et al (2011) highlighted the effectiveness of a program (ParentCorps) that was designed and implemented by teachers and health professionals for ethnically diverse families from underserved, urban communities. ParentCorps included a series of 13 group sessions for parents and their children held at elementary schools after school hours. This program had positive effects on parent engagement with their children, which should be related to future student achievement inside and outside of school (Brotman et al., 2011).

Table 3: Methods from Scholarly Evaluations in the Behavioural Domain at a Glance

Evaluations	Archambault et al., 2009	Baydala et al., 2009	Brotman et al., 2011	Crooks et. al., 2009	Flay, 2002	Golley et al., 2010	Grieve, 2009	Lassen et al., 2006	Ni Mhurchu et al., 2010	Storey et al., 2011
Quantitative methods	✔	✔	✔	✔	✖	✔	✔	✔	✔	✔
Qualitative methods	✖	✖	✔	✔	✖	✖	✖	✔	✔	✖
Review synthesis (multiple methods)	✖	✖	✖	✖	✔	✖	✖	✖	✖	✖
Sample populations:										
Students	✔	✔	✔	✔	✔	✔	✖	✔	✔	✔
Teachers	✖	✔	✔	✔	✔	✖	✔	✖	✔	✖
Administrators	✖	✖	✖	✔	✔	✖	✖	✖	✔	✖
Parents	✖	✔	✔	✔	✔	✖	✖	✖	✔	✖
Community organizations	✖	✖	✖	✔	✔	✖	✖	✖	✖	✖
Results:										
Cognitive	✔	✔	✖	✔	✖	✖	✖	✔	✔	✖
Behavioural	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Affective	✔	✖	✖	✔	✖	✖	✖	✖	✔	✖
CSH Pillars:										
Teaching and Learning	✔	✔	✖	✖	✔	✔	✔	✔	✖	✔
Social & Physical Environments	✔	✖	✖	✔	✔	✔	✔	✖	✔	✔
Healthy School Policy	✔	✖	✖	✔	✖	✖	✖	✔	✖	✖
Partnerships and Services	✖	✖	✔	✔	✔	✖	✖	✖	✔	✖

Legend
✔ represents element present
✖ represents element absent

Table 4: Results from Scholarly Evaluations Focused on the Behavioural Domain

Evaluation Title	Cognitive			Behavioural			Affective		
	Academic	Success	Environ-mental	Academic	Success	Environ-mental	Academic	Success	Environ-mental
Archambault et al., 2009	X	N	X	X	N	X	N	X	X
Baydala et al., 2009	N	X	X	X	N	X	X	X	X
Brotman et al., 2011	X	X	X	X	X	+	X	X	X
Crooks et. al., 2009	+	X	X	+	X	X	X	+	X
Flay, 2002 (REVIEW SYNTHESIS)	X	X	X	X	M	X	X	X	X
Golley et al., 2010	X	X	X	X	M	X	X	X	X
Grieve, 2009	X	X	X	X	M	X	X	X	X
Lassen et al., 2006	+	X	X	+	X	X	X	X	X
Ni Mhurchu et al., 2012	N	X	X	N	X	X	X	N	X
Storey et al., 2011	X	X	X	X	M	X	X	X	X

Legend
+ represents positive effect
N represents neutral or negative effect
M represents mixed effect
X represents that the element was not measured

Scholarly Evaluations Addressing the Affective Domain

Ten scholarly evaluations were reviewed for the affective domain: two Canadian (British Columbia and Ontario), two American (multiple states), three European (Sweden; Finland; England and Wales), one Australian, and two international. One Canadian evaluation (Richmond et al., 2012) was focused on Aboriginal populations (see Table 5). Two studies used qualitative methods only, six studies quantitative methods only, and one study mixed methods. The final study was a review synthesis. Five studies focused solely on students, while one study (Maller, 2009) had no student involvement. The most common CSH pillar employed (eight studies) was Social and Physical Environments. A single study (Kidger et al., 2009) made connections to all four pillars.

Five studies reported on the academic affective indicator, namely, academic motivation, four with positive effects (see Table 6). Students who participated in a comprehensive school health initiative tended to have better outcomes than those who had not, particularly in "high implementation" schools (Battitustich et al., 2004). When teachers were trained in Social Emotional Learning (Kimber et al., 2008), students' self-awareness and emotional management increased. In the Mallett (2009) study, activities involving hands-on contact with nature were perceived by educators to improve self-esteem, engagement with school, and sense of empowerment. For Aboriginal youth interviewed, level of trust was key in their help-seeking (Richmond et al., 2012). Like many review syntheses, Kidger et al. (2012) found inconsistent evidence with regards to effects on a range of affective outcomes.

Nine studies explored the success affective indicator, mental health. All but one found positive effects. In contrast to the others, Kidger et al. (2012) reported that two nonrandomized trials found evidence that supportive school environments could improve student emotional

health, while three randomized controlled trials (the most rigorous form of evidence) did not. There was also some support to show that individual perceptions of school connectedness and teacher support predicted future emotional health. A range of mental health measures was used across the remaining studies, including feelings of belongingness (Richmond et al, 2012), emotional health (Freeman et al., 2009; Reback, 2010), emotional problems/emotional distress/internalizing problems (Hoglund & Leadbeater, 2009; Kidger et al., 2009; Kimber et al. 2008), global satisfaction (Katja et al., 2002), and sense of empowerment (Maller, 2009).

Two of the three studies using qualitative methods (one of which used mixed methods) discussed the positive effects of CSH on the environmental affective indicator of an inclusive school environment. For Richmond et al. (2012), this environment constituted a cultural safety focus for Aboriginal youth in schools. Kidger et al. (2009) talked instead about a positive psychosocial environment. For Freeman et al.'s quantitative cross-national study, the emphasis was placed on teacher and peer support.

Three of 10 studies measured achievement test scores in addition to measuring factors in the affective domain (Battistich et al., 2004; Freeman et al., 2009; Reback, 2010), all with positive findings. Eight studies measured concepts in the behavioural domain (success indicator) in addition to the affective domain (Battistich et al.; Freeman et al.; Hoglund & Leadbeater, 2004; Katja et al., 2002; Kidger et al., 2012; Kimber et al., 2008; Reback; Richmond et al., 2012) with three of these studies discussing bullying (Freeman et al.; Kimber et al.; Richmond et al.) and four describing poor student behaviours (e.g., drinking; externalizing problems; Battistich et al.; Hoglund & Leadbeater; Katja et al.; Reback). Freeman et al. showed additional positive effects on truancy, a measure of attendance available through school records.

Table 5: Methods from Scholarly Evaluations in the Affective Domain at a Glance

Evaluations	Battistich et al., 2004	Freeman et al., 2009	Hoglund & Leadbeater, 2004	Katja et al., 2002	Kidger et al., 2009	Kidger et al., 2012	Kimber, Sandell, & Bremberg, 2008	Maller, 2009	Reback, 2010	Richmond et al., 2012
Quantitative methods	✔	✔	✔	✔	✔	✖	✔	✖	✔	✖
Qualitative methods	✖	✖	✖	✖	✔	✖	✖	✔	✖	✔
Review synthesis (multiple methods)	✖	✖	✖	✖	✖	✔	✖	✖	✖	✖
Sample populations:										
Students	✔	✔	✔	✔	✔	✔	✔	✖	✔	✔
Teachers	✖	✖	✔	✖	✔	✖	✖	✔	✖	✖
Administrators	✖	✖	✖	✖	✔	✖	✖	✔	✔	✖
Parents	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Community organizations	✖	✖	✖	✖	✖	✖	✖	✔	✖	✖
Results:										
Cognitive	✔	✔	✖	✖	✖	✖	✖	✖	✔	✖
Behavioural	✔	✔	✔	✔	✖	✔	✔	✖	✔	✖
Affective	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
CSH Pillars:										
Teaching and Learning	✖	✖	✖	✖	✔	✔	✔	✔	✔	✖
Social and Physical Environments	✔	✔	✔	✔	✔	✔	✖	✔	✖	✔
Healthy School Policy	✖	✖	✖	✖	✔	✖	✖	✖	✔	✔
Partnerships and Services	✔	✖	✖	✖	✔	✔	✖	✔	✖	✔

Legend

✔ represents element present
✖ represents element absent

Table 6: Results from Scholarly Evaluations Focused on the Affective Domain

Evaluation Title	Cognitive			Behavioural			Affective		
	Academic	Success	Environ-mental	Academic	Success	Environ-mental	Academic	Success	Environ-mental
Battistich et al., 2004	+	X	X	X	+	X	+	X	X
Freeman et al., 2009	+	X	X	+	+	X	X	+	+
Hoglund & Leadbeater, 2004	X	X	X	X	+	X	X	+	X
Katja et al., 2002	X	X	X	X	+	X	X	+	X
Kidger et al., 2009	X	X	X	X	X	X	X	+	+
Kidger et al., 2012 (REVIEW SYNTHESIS)	X	X	X	X	M	X	M	M	X
Kimber et al., 2008	X	X	X	X	M	X	+	+	X
Maller, 2009	X	X	X	X	X	X	+	+	X
Reback, 2010	+	X	X	X	+	X	X	+	X
Richmond et al., 2012	X	X	X	X	+	N	+	+	+

Legend
+ represents positive effect
N represents neutral or negative effect
M represents mixed effect
X represents that the element was not measured

Grey Literature Addressing the Cognitive Domain

As shown in Table 7, 10 documents were reviewed for the cognitive domain. Of the 10 documents, six were from the United States (one each from Washington and San Diego, and the rest from multiple places in the US) and four were international. Eight studies were review syntheses, while the remaining two were quantitative. All but one study (Murray et al., 2011) examined Physical and Social Environments. No study used all four CSH pillars.

All 10 studies identified achievement test scores (cognitive academic indicator) as an indicator of student achievement (see Table 8). Three studies examined the effect of physical activity on test scores and found there to be a positive relationship (CDC, 2010; IOM, 2013; Stead & Nevill, 2010). For example, the Institute of Medicine (IOM, 2013) found that more physically active children demonstrated greater attentional resources, had faster cognitive processing speed, and performed better on standardized academic tests. Similarly, the publication developed for the Centers for Disease Control and Prevention (CDC, 2010), examined studies which looked at the association between physical activity and academic performance. Stead and Nevill concluded that academic achievement is maintained or enhanced by increased physical education, physical activity, or sport with further research needed to establish the optimal intensity and duration for cognitive stimulation in young people.

Two publications focused on nutrition and breakfast programs (Dotter, 2012; Frisvold, 2012) and found a positive association between these programs and academic performance. Three studies examined school-based health interventions and coordinated school health programs (Dilley, 2009; Murray et al., 2007; Suhrke & de Pa Nieves, 2011), while one study created a framework to a systems-based approach considering factors related to school achievement by identifying home, school-level, and classroom-level variables and showing how

they were interrelated (Huitt et al, 2009). These four studies too showed positive effects of the school health initiative. Finally, the contributions of school nurses to academic achievement represented the foundation for Puskar and Bernardo's (2007) review synthesis.

Two studies investigated the effects of CSH initiatives on high school progression (cognitive success indicator). Student achievement measures encompassed level or years of education achieved, dropping out, and college enrolment for Suhrke and de Paz Nieves (2011). Years of school completed was a measure of student achievement for CDC (2010).

Three of the 10 evaluations addressed areas in the behavioural domain in addition to the cognitive domain (CDC, 2010; Dotter, 2012; Suhrke & de Pa Nieves, 2011). Dotter and Suhrke and de Paz Nieves both used attendance records as one measure of student achievement (academic behavioural indicator). CDC used a number of behavioural measures from school records (attendance, disciplinary problems) and student participation (time on task, concentration or attentiveness in educational settings). CDC was the only study using any indicator from the affective domain, namely, mental health, as measured by school connectedness.

Only one study studied environmental indicators by examining adult engagement as exemplified by school nurses (behavioural environmental). Puskar and Bernardo (2007) led a discussion on how school nurses promote mental health and subsequent academic achievement by screening and referring children who demonstrate mental health problems. Key findings included the idea that, to improve academic achievement, schools should focus their efforts on the psychosocial issues that affect learning and not only focus on improving learning itself with school nurses playing a key role.

Table 7: Methods from Grey Literature in the Cognitive Domain at a Glance

Evaluations	CDC, 2010	Dilley, 2009	Dotter, 2012	Frisvold, 2012	Huitt et al., 2009	IOM, 2013	Murray et al., 2007	Puskar & Bernardo, 2007	Stead & Nevill, 2010	Suhrcke & de Paz Nieves, 2011
Quantitative methods	✖	✖	✔	✔	✖	✖	✖	✖	✖	✖
Qualitative methods	✖	✖	✖	✖	✖	✖	✔	✖	✔	✖
Review synthesis (multiple methods)	✔	✔	✖	✖	✔	✔	✔	✔	✔	✔
Sample populations:										
Students	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Teachers	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Administrators	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Parents	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Community organizations	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Results:										
Cognitive	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Behavioural	✔	✖	✔	✖	✖	✖	✖	✔	✖	✔
Affective	✔	✖	✖	✖	✖	✖	✖	✖	✖	✖
JCSH Pillars:										
Teaching and Learning	✖	✖	✖	✖	✔	✖	✖	✖	✖	✖
Social/Physical Environs.	✔	✔	✔	✔	✔	✔	✖	✔	✔	✔
Healthy School Policy	✖	✔	✖	✖	✔	✔	✔	✖	✖	✖
Partnerships and Services	✖	✖	✖	✖	✖	✔	✖	✖	✖	✖

Legend
✔ represents element present
✖ represents element absent

Table 8: Results from Grey Literature Focused on the Cognitive Domain

Evaluation Title	Cognitive			Behavioural			Affective		
	Academic	**Success**	**Environ-mental**	**Academic**	**Success**	**Environ-mental**	**Academic**	**Success**	**Environ-mental**
CDC, 2010 (REVIEW SYNTHESIS)	+	+	X	+	+	X	X	+	X
Dilley, 2009 (REVIEW SYNTHESIS)	+	X	X	X	X	X	X	X	X
Dotter, 2012	+	X	X	+	X	X	X	X	X
Frisvold, 2012	+	X	X	X	X	X	X	X	X
Huitt et al., 2009 (REVIEW SYNTHESIS)	+	X	X	X	X	X	X	X	X
Institute of Medicine, 2013 (REVIEW SYNTHESIS)	+	X	X	X	X	X	X	X	X
Murray et al., 2007 (REVIEW SYNTHESIS)	+	X	X	X	X	X	X	X	X
Puskar & Bernardo, 2007 (REVIEW SYNTHESIS)	+	X	X	X	X	+	X	X	X
Stead & Nevill, 2010 (REVIEW SYNTHESIS)	+	X	X	+	X	X	X	X	X
Suhrcke & de Paz Nieves, 2011 (REVIEW SYNTHESIS)	+	+	X	+	X	X	X	X	X

Legend
+ represents positive effect
N represents neutral or negative effect
M represents mixed effect
X represents that the element was not measured

Grey Literature Addressing the Behavioural Domain

Ten documents were reviewed for the behavioural outcomes domain (see Table 9). Of the 10 documents, two were from Canada (Alberta and New Brunswick), six from the United States (two New York, one Texas, one Connecticut, and two multiple states), and two from Europe (England and Ireland). One Canadian document (Taxbock, 2009) was focused on Aboriginal communities in Alberta. In contrast to the scholarly literature on the behavioural domain, most studies were mixed methods (eight in total). One study used only qualitative methods (Limerick Health Promotion, 2008), while Harvard Family Research Project (2008) was a research synthesis. Arthur et al. (2011) addressed all four CSH pillars. Partnerships and Services was the most common CSH pillar included (nine studies).

All evaluations, regardless of indicator or measure used, showed positive results (Table 10). Seven evaluations (Capparelli, 2003; Children's Aid Society, 2008; Connecticut Association of School Based Health Centers, 2009; Harvard Family Research Project, 2008; Hinojosa & Oshitoye, 2006; Limerick Health Promotion, 2008; Taxbock, 2009) directly measured attendance (the academic behavioural indicator). Three studies used school records to determine negative school behaviour as shown in discipline referrals (Arthur et al., 2011; Hinojosa & Oshitoye) and suspension rates (Harvard Family Research Project), a less direct measure of attendance.

Four evaluations examined the success behavioural indicator, student participation. In the Arthur et al. (2011) research, NHSP initiatives led to students being less disruptive and more involved in decision-making. Schools informally observed improvements to students' behaviours since introducing healthier food, with reduced incidences of disruption. Participation in Roots of Empathy increased students' pro-social behaviours (e.g., sharing, helping, cooperating) and ability to resolve conflicts among peers (Roots of Empathy, 2010). Participants in the Children

Aid's Society (2008) after-school program had more positive youth development than students who had not participated in the program. Students who received the Fast Track Prevention Trial for Conduct Disorders intervention had better teacher and parent ratings on behaviour with peers and adults, and better overall ratings by observers on aggressive and/or disruptive classroom behaviour than control students (Conduct Problems Prevention Group, 2009).

One study explored adult engagement, the behavioural environmental indicator, as Caparelli (2009) emphasized the role of the school nurse as a caregiver. The Roots of Empathy (2010) study also highlighted the role of the environment by indicating how students in the program became more supportive in the classroom environment and were more aware of what actions were emotionally appropriate when peers were in distress (affective environmental, inclusive school environment). A single additional study touched the affective domain as the research synthesis by the Harvard Family Research Project (2008) investigated student self-esteem, self-efficacy, and self-confidence.

In contrast to the limited focus on the affective domain within the grey literature addressing the behavioural domain, six of 10 evaluations measured concepts in the cognitive domain in addition to measuring factors in the behavioural domain. Three of these six evaluations (Caparelli, 2003; Children's Aid Society, 2008; Harvard Family Research Project, 2008) used achievement test scores as an indicator. Three studies measured drop-out rates/early school leaving (Harvard Family Research Project; Limerick Health Promotion, 2008; Taxbock, 2009). Hinojosa and Oshitoye (2006) considered student progress, while the Harvard Family Research Project additionally examined promotion rates and credits earned.

Table 9: Methods from Grey Literature in the Behavioural Domain at a Glance

Evaluations	Arthur et al., 2011	Capparelli, 2003	Children's Aid Society, 2008	Conduct Problems Prevention Research Group, 2009	Connecticut Association of School Based Health Centers, 2009	Harvard Family Research Project, February 2008	Hinojosa & Oshitoye, 2006	Limerick Health Promotion, 2008	Roots of Empathy, 2010	Taxbock, 2009
Quantitative methods	✔	✔	✔	✔	✔	✖	✔	✖	✔	✔
Qualitative methods	✔	✔	✔	✔	✔	✖	✔	✔	✔	✔
Review synthesis (multiple methods)	✖	✖	✖	✖	✖	✔	✖	✖	✖	✖
Sample populations:										
Students	✔	✖	✔	✔	✔	✔	✔	✔	✔	✖
Teachers	✔	✖	✔	✔	✖	✔	✔	✔	✔	✔
Administrators	✔	✔	✔	✖	✖	✖	✔	✔	✖	✔
Parents	✖	✖	✔	✖	✖	✖	✔	✔	✖	✔
Community organizations	✖	✔	✔	✖	✖	✔	✔	✔	✖	✔
Results:										
Cognitive	✖	✔	✔	✖	✖	✔	✔	✔	✖	✔
Behavioural	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Affective	✖	✖	✖	✖	✖	✔	✖	✖	✔	✖
CSH Pillars:										
Teaching and Learning	✔	✔	✔	✖	✔	✖	✖	✖	✔	✔
Social and Physical Environments	✔	✔	✖	✔	✖	✖	✔	✔	✖	✖
Healthy School Policy	✔	✖	✖	✖	✖	✖	✖	✔	✖	✖
Partnerships and Services	✔	✔	✔	✔	✔	✔	✔	✖	✔	✔

Legend

✔ represents element present
✖ represents element absent

Table 10: Results from Grey Literature Focused on the Behavioural Domain

Evaluation Title	Cognitive			Behavioural			Affective		
	Academic	Success	Environ-mental	Academic	Success	Environ-mental	Academic	Success	Environ-mental
Arthur et al., 2011	X	X	X	+	+	X	X	X	X
Capparelli, 2003	+	X	X	+	X	+	X	X	X
Children's Aid Society, 2008	+	X	X	+	+	+	X	X	X
Conduct Problems Prevention Research Group, 2009	X	X	X	X	+	+	X	X	X
Connecticut Association of School Based Health Centers, 2009	X	X	X	+	X	+	X	X	X
Harvard Family Research Project, 2008 (REVIEW SYNTHESIS)	+	+	X	+	X	X	+	X	X
Hinojosa & Oshitoye, 2006	X	+	X	+	X	X	X	X	X
Limerick Health Promotion, 2008	X	+	X	+	X	X	X	X	X
Roots of Empathy, 2010	X	X	X	X	+	X	X	X	+
Taxbock, 2009	X	+	X	+	X	X	X	X	X

Legend
+ represents positive effect
N represents neutral or negative effect
M represents mixed effect
X represents that the element was not measured

Grey Literature Addressing the Affective Domain

As shown in Table 11, 10 documents were reviewed for the affective domain. Of the 10 documents, three were from Canada (British Columbia; national [across Canada]; Yukon), two were from the United States (Ohio; multiple states), four were from Australia, and one used international data. Four studies used mixed methods, two studies used quantitative methods, and three studies were research syntheses. One study (Queensland Health et al., 2005) was an audit tool/framework designed to measure Comprehensive School Health in one Australian state. Five studies included students among the respondents, while five studies included teachers. Osher et al. (2008) and Queensland Health et al. (2005) used all four CSH pillars.

Mental health (success affective) can be measured through concepts such as well-being, ill-being, suicidal tendencies, and depression. All 10 documents (see Table 12) identified mental health as an indicator of student achievement with six of these additionally examining behavioural issues related to mental health issues (such as behavioural problems and bullying). Three of these articles either provided frameworks or concrete recommendations for improving the mental health of students (American School Health Association, 2010; Kendall, 2003; Queensland Health et al., 2005). Three articles evaluated an initiative to improve mental health with positive effects (Askell-Williams et al., 2005; Payton et al., 2008; Slee et al., 2009). Osher et al. (2008) concluded that Cleveland schools lacked effective programs to address students' emotional problems. Teachers in Froese-Germain et al.'s (2012) study felt numerous barriers existed to mental health service provision for students including difficulties in identification.

Three studies (Freeman et al., 2011; Hazell, 2005; Payton et al., 2008) viewed mental health with respect to students' feelings of belongingness. When schools implemented a

professional development program for teachers focusing on health behaviours, students showed improvements in overall school attachment scores (Hazell, 2005). Likewise, improvements in students' feelings of connection towards school increased after the implementation of social emotional learning (SEL) programs (Payton et al., 2008). Freeman et al. (2011) reported on survey data from Yukon schools: Grade 9 and 10 rural boys viewed their school experience in the most negative light, being the least likely to feel like they belonged at school.

In contrast to the widespread focus on mental health, only three studies examined academic motivation (academic affective). SEL programs improved students' attitudes about self and academic performance (Payton et al., 2008) among other outcomes. Improved self-regulation and coping were included in the outcome measures for *KidsMatter* (Slee et al., 2009), as was student learning (cognitive). Hazell (2005) found that *MindMatters* students showed overall improvement in autonomy experience and effective help-seeking scores but not in self-esteem.

Two of the three review syntheses stressed the importance of an inclusive school environment (environmental affective) as an indicator of student achievement. The American School Health Association (2010) report recommended that administrators should consider the attitudes and behaviours that promote physical, intellectual, emotional, social and environmental health when making hiring and management decisions, while Kendall (2003) found that epidemiological data indicated numerous significant risk patterns in children and youth that could be modified to include school health promotion as a key component (e.g., school environment). The Queensland Health et al. (2005) included inclusive school environment as a critical indicator. Osher et al. (2008) felt that the environment in Cleveland schools was not conducive to student achievement.

Table 11: Methods from Grey Literature in the Affective Domain at a Glance

Evaluations	American School Health Association, 2010	Askell-Williams et al., 2005	Freeman et al., 2011	Froese-Germain et al., 2012	Hazell, 2005	Kendall, 2003	Osher et al., 2008	Payron et al., 2008	Queensland Health et al., 2005	Slee et al., 2009
Quantitative methods	✖	✔	✔	✔	✔	✖	✔	✖	✖	✔
Qualitative methods	✖	✔	✖	✖	✔	✖	✔	✖	✖	✔
Review synthesis (multiple methods)	✔	✖	✖	✖	✖	✔	✖	✔	✖	✖
Sample populations:										
Students	✖	✖	✔	✖	✔	✔	✔	✔	✖	✖
Teachers	✖	✔	✖	✔	✔	✖	✔	✖	✖	✔
Administrators	✔	✔	✖	✖	✔	✖	✔	✖	✖	✖
Parents	✖	✖	✖	✖	✖	✖	✔	✖	✖	✔
Community organizations	✖	✖	✖	✖	✖	✖	✔	✖	✖	✖
Results:										
Cognitive	✖	✖	✖	✖	✖	✖	✖	✔	✖	✔
Behavioural	✖	✔	✔	✔	✖	✔	✔	✔	✔	✔
Affective	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
CSH Pillars:										
Teaching and Learning	✖	✔	✖	✖	✔	✔	✔	✔	✔	✔
Social and Physical Environs.	✖	✖	✔	✔	✖	✖	✔	✔	✔	✔
Healthy School Policy	✔	✔	✖	✔	✖	✔	✔	✖	✔	✖
Partnerships and Services	✔	✖	✖	✖	✔	✔	✔	✖	✔	✖

Legend

✔ represents element present
✖ represents element absent

Table 12: Results from Grey Literature Focused on the Affective Domain

Evaluation Title	Cognitive			Behavioural			Affective		
	Academic	Success	Environ-mental	Academic	Success	Environ-mental	Academic	Success	Environ-mental
American School Health Association, 2010 (REVIEW SYNTHESIS)	X	X	X	X	X	X	X	+	+
Askell-Williams et al., 2005	X	X	X	X	X	+	X	+	X
Freeman et al., 2011	X	X	X	X	+	X	X	+	X
Froese-Germain et al., 2012	X	X	X	X	+	X	X	+	X
Hazell, 2005	X	X	X	X	X	X	M	+	X
Kendall, 2003 (REVIEW SYNTHESIS)	X	X	X	X	X	+	X	+	+
Osher et al., 2008	X	X	X	X	+	X	X	+	+
Payton et al., 2008 (REVIEW SYNTHESIS)	X	+	X	X	+	X	+	+	X
Queensland Health et al., 2005 (AUDIT TOOL)	X	X	X	X	+	+	X	+	+
Slee et al., 2009	X	+	X	X	+	X	+	+	X

Legend
+ represents positive effect
N represents neutral or negative effect
M represents mixed effect
X represents that the element was not measured

CHAPTER 3: INTERVIEWS WITH EDUCATION AND HEALTH EXPERTS ACROSS CANADA

The Pan-Canadian Joint Consortium for School Health (JCSH) is a partnership of Canada's federal, provincial, and territorial governments across all provinces and territories, with the exception of Quebec. The JCSH brings together key representatives from each jurisdiction's health and education ministries, and supports them to work more closely together to promote holistic approaches to school health across Canada. The JCSH's mission is to provide leadership and facilitate a comprehensive approach to school health by building the capacity of the education and health systems to work together (JCSH, 2013). To help identify core indicators and measures of student achievement across provinces and territories, the perspectives of education and health experts were explored in this study using two representatives from each of the nine provinces and three territories that comprise the JCSH membership.

Overview

Recruitment

In May, June, and July 2013, telephone interviews were conducted with education and health experts across Canada. Members of the School Health Coordinators' Committee (i.e., a formal core committee of the JCSH) guided this research project and identified 80 names of education and health experts across the country, with the research team at the Social Program Evaluation Group (SPEG) systematically selecting two interviewees from the recommended names per province/territory. Names were selected based on equitable representation of, insofar as possible, researchers (e.g., professors), policy specialists (e.g., employees at Ministries of Education and Health involved with school health and/or student achievement initiatives), and

practitioners (e.g., employees in school boards/divisions involved with school health and/or student achievement initiatives). Some experts fell into more than one category; for instance, it was likely that a researcher was also a practitioner.

Twenty-four experts were interviewed (see Appendix B for list of interviewees). There were 5 individuals whose only identification of area of expertise was health. There were 11 individuals whose area of identification was education. There were 8 interviewees who had a joint designation: 5 of these had education first (Education/Health), while 3 had health first (Health/Education). Experts were additionally categorized as researchers (6), policy specialists (11), or practitioners (7) based on the current position they most prominently occupied.

Using a standard email message, members of the School Health Coordinators' Committee contacted potential interview participants seeking permission to share their names with the SPEG research team. The three interviewers on the SPEG research team emailed interview participants using a standard email message requesting an interview. This email message contained a Letter of Information, Consent Form, and the interview questions.

Interview questions were formulated by the SPEG research team based on the literature reviewed with members of the JCSH Research Advisory Working Group (informal ad hoc working group that guided this research project) providing feedback and recommendations that shaped the final questions (see Appendix I). Consent Forms were completed by interviewees. Some of the interviewees consented to share their names and/or names of their organization/place of employment, while others did not give such consent. All interviewees agreed to have their interviews audio recorded. All interviewees requested copies of the research findings to be emailed and/or mailed to them. Interviews lasted approximately one hour. The

three interviewers followed protocol by using an interview guide. Interviewees provided their demographic characteristics to the interviewer (i.e., full name, geographic location, name of organization they represent, name of position/title they represent, and the length of time they have occupied that position).

When interviewees explicitly indicated their identity could be revealed, their name appears. When confidentiality was requested by the interviewee, the designation “Health Expert” or “Education Expert” was used. Six interviewees requested confidentiality, although two of these indicated their organization could be named. For these three individuals their province is noted. To distinguish among the remaining four experts, the codes EXP1, EXP2, EXP3, and EXP4 were randomly assigned.

Analysis of Interview Data

The first step in the analysis of the interview involved coding the interviews based on the three broad domains suggested by the literature and used to frame the literature review: cognitive, behavioural, and affective. Once the data were coded into these three categories, we identified two contexts within each domain, namely, individual and environmental. For each of the six domain/context combinations (e.g., cognitive/individual; behavioural/environmental), we divided the data into four indicators, each with its own measures (24 indicators in all). For example, in the affective/individual group, we had mental health, coping strategies, self-processes, and students’ feelings of belongingness. Factors influencing the relationship between initiative and indicator formed another category, which we termed mediating factors. We presented this analysis to the members of the JCSH and revised the 24-indicator framework based on their feedback.

The next stage of analysis involved re-examining the interview data in line with the JCSH feedback. At this point, the SPEG research team realized that the indicators within each domain could be classified into three broad groupings: academic indicators, success indicators, and environmental indicators (see Table 13). Academic indicators reflected academic achievement: achievement test scores (cognitive), attendance (behavioural), and academic motivation (affective). Success indicators focused more globally on student achievement: high school progression (cognitive), student participation (behavioural), and mental health (affective). Environmental indicators reflected environmental changes that tend to influence student achievement: understanding of Comprehensive School Health (cognitive), adult engagement (behavioural), and inclusive school environment (affective). We then placed measures under the indicator we felt best represented them. We recognize fully that our placement of measures might not be congruent with the thinking of all the experts we interviewed or the members of the JCSH. This new framework met with generally positive JCSH support.

The positioning of the indicators in Table 13 is based on our conceptualization of student achievement. The rows are ordered from the most common understanding of student achievement as shown in the literature and interviews (academic) through to the least common understanding (environmental) with success falling between those two. The column ordering reflects the ordering adopted in the presentation of the literature review.

Table 13: Common Indicators and Measures (CIM) Framework

	COGNITIVE	**BEHAVIOURAL**	**AFFECTIVE**
ACADEMIC INDICATORS	*Achievement test scores:* standardized tests, GPA, report cards	*Attendance:* absences, lates, suspensions/expulsions	*Academic motivation:* academic self-concept/self-efficacy, self-regulation, self-confidence, intrinsic/extrinsic motivation, coping strategies
SUCCESS INDICATORS	*High school progression*: graduation rates, graduating with Honours, credit attainment, drop-out rates, post-secondary plans	*Student participation*: number of activities in which students participate, type of participation (e.g., leadership; on-task/off-task), variety of participation (in-class, extra-curricular, community), quality of participation (student engagement, peer relationships)	*Mental health:* well-being, ill-being, suicidal tendencies, depression, school connectedness
ENVIRONMENTAL INDICATORS	*Understanding of Comprehensive School Health:* student, teacher, school administrator, parent, community	*Adult engagement:* parent and family member authentic engagement in school, teacher and administrator professional development, community partnerships	*Inclusive school environment:* safety, accepting environment, positive school culture, healthy school "buy-in"

Academic Indicators

Achievement Test Scores (Cognitive)

> *When I hear student achievement, marks, grades, and graduation come to mind immediately. That's all.* (Education Expert [EXP2], June 14, 2013)

Although the experts recognized how the terms student achievement and academic achievement are often used interchangeably, all of them saw academic achievement as only one aspect of student achievement and referenced achievement test scores as being one indicator of student achievement. They seemed to agree with John Burger, the Director of Schools with Responsibilities for Data and Analytics at Rocky View School Division in Alberta, that "student achievement is largely the cognitive dimension of student learning, but it should be measured in multiple ways including formative and summative assessments" (J. Burger [Education, AB], May 29, 2013). "You have to recognize that no measure is perfectly accurate, so the more measures you have the more accurate your perceptions will ultimately be" (J. Burger).

Nineteen of the interviewees (79%) explicitly acknowledged that their understanding of student achievement extended beyond academic achievement: "My understanding of student achievement has broadened to include students feeling safe, working to their potential, and having the supports necessary for them to work to their potential" (Education Expert [EXP1], June 12, 2013). Therefore, multiple aspects of student achievement needed to be measured including "looking at how kind people are, how good are they at relationships, how good they are at supporting their fellow students" (E. Coldbeck [Health, AB], May 24, 2013). Elizabeth Coldbeck, Project Coordinator at Alberta Healthy Schools Community Wellness Fund (a partnership between the Government of Alberta and the University of Alberta), further noted that

"perception data is just as valuable as results," in that perception data should enable stakeholders to work on improving wellness because "by working on wellness, you help students achieve academically, that is one measure of success" (E. Coldbeck, May 24, 2013). Similarly, while educators needed to measure more than academic achievement to fully understand student achievement, public health workers needed to move beyond nutrition and physical activity as their sole means to improve student achievement (Health Expert [EXP4], June 11, 2013).

Standardized test scores were universally seen as a measure of student achievement. Bill Allan, a School Health Liaison Consultant in NL, noted that standardized test scores have become a primary measure of academic achievement across Canada; "[high student achievement is largely based] on performing well on standardized tests and learning the curriculum outcomes as outlined by the Department of Education" (B. Allan, May 30, 2013). "When I think about achievement, I think about mathematics scores, literacy scores. Things that are measured by the provincial government … for the provincial achievement test, and that's why I think automatically about those two things" (Education Expert [EXP3], June 4, 2013).

Achievement test scores encompassed more than standardized assessments required by the province or territory. Merril Dean, the Coordinator for Student Services at the Yellowknife Catholic School District in NT, saw that, just as multiple measures of student achievement are important, multiple measures of academic achievement are also important and need to be treated like parts of a whole to gain a more thorough understanding of how students are performing: "You can look at grades, but that can be difficult because sometimes grades can be teacher-dependent. You can look at some standardized testing and improvement over time. However, they're all independent indicators … they're all pieces of the puzzle" (M. Dean, May 30, 2013).

Measures not commonly conceived of with respect to achievement test scores could emerge, such as, the Ontario learning skills and work habits evaluation tool (Education Expert [ON], June 6, 2013) and measures examining learning outside the curriculum: "if they have some support in terms of extra teaching or tutorials and the ability to work hard, they can achieve student achievement, in ways that are outside of the curriculum" (B. Allan, May 30, 2013).

Attendance (Behavioural)

> *The conditions have to exist for students to feel comfortable to attend. ... So if they're not coming to school, that's the first problem, so any impediments to attendance have to be addressed.* (C. Robinson, Superintendent of Schools, Nunavut, June 9, 2013).

A consensus arose among interviewees in both the health and education sectors acknowledging that students' behaviour was an important part of the larger puzzle in understanding student achievement. They advocated understanding how students behave "to gain a better grasp on how and why they [students] perform academically and socially" (K. McGarry), understanding the importance of concrete measures of behaviour as shown in school records of attendance. An Education Expert (EXP2) acknowledged that "what people think and feel is closely related to how they act, so it is good that student success measures are starting to focus on behaviours as well as the cognitive bit" (Education Expert [EXP2], June 14, 2013).

Thirteen interviewees (54%) mentioned that school attendance was a measure of student achievement, as "students' presence in a class increases their access to knowledge, and they have more opportunities for socialization" (Education Expert [ON], June 6, 2013). Therefore, absenteeism should be promptly addressed because it is usually a symptom of an underlying issue. The CSH framework specifically addresses the importance of providing students with a

positive school environment that contributes to improving attendance: “I think there’s definitely been a clear understanding of the way that CSH can contribute to reducing absenteeism which may improve student performance” (E. Saewyc, May 29, 2013).

Five of 24 interviewees (21%) stated that students’ misbehaviour can influence their academic performance by resulting in their suspension from school and general disengagement from learning. In this sense, school suspensions and expulsions are another means of measuring attendance. Students’ behaviours are influenced by how teachers respond to them and even how their families interact with them (Burger; EXP4; Education Expert [ON]). Four of the five interviewees who mentioned students’ misbehaviour also noted how poor school attendance can be a measure of student achievement, thereby viewing multiple lens through which school records might act as an indicator of attendance and thus student achievement.

Academic Motivation (Affective)

> *How students feel about themselves and about their work is reflected in their performance academically.* (Education Expert [ON], June 6, 2013)

Some type of self- process (e.g., self-regulation, academic self-concept/self-efficacy) was mentioned by half of the interviewees with respect to academic motivation. A recent American Educational Research Association (AERA) conference paper found that, “student self-confidence emerges as the most dominant construct that contributes to student achievement” (J. Burger, May 29, 2013). Similarly, when students are provided with opportunities to engage in self-regulation through deep breathing three times a day, they seem to better regulate and stay on task (Stacey Burnard, Yukon Department of Education). Such self-regulation needs to be promoted in a safe environment in which students know that they are cared for. Self-regulation encompasses both

attending to a task and responding appropriately: The "whole idea of the importance of self-regulation, and leading to positive displays of social behaviour, able to respond emotionally in an appropriate manner, responding to stress in a pro-social way, and being able to advocate for those services" (Education Expert [NWT], June 5, 2013).

In addition to self-regulation and self-confidence, self-esteem was a critical measure:

> *I think of every child, whether it's your highest needs child, or your most advanced working to whatever their full potential is, and being accepted, and acknowledged, and praised for doing a great job on what they've done. Looking at the tiniest achievement is something to say 'wow' to, 'great job', so that they all feel valued. … That's what I see as important if we're going to have healthy beings that grow up with a very positive self-esteem and a good feeling about themselves.* (J. Voysey, June 11, 2013)

Coping strategies can be viewed as a measure of academic motivation as these strategies are accessed when students are motivated. Help-seeking was a critical coping strategy: "kids who ask for help from school staff, and who find that they were helped [are] less likely to report [and experience] some of the more concerning mental health issues like suicidality or self-harm" (E. Saewyc, May 29, 2013). However, not all students have the skills to cope with difficulty through seeking help: "A large portion of our students are living in very stressful conditions, and don't have the skill- set to respond, or to even think of what they need." (Education Expert [NWT], June 5, 2013). As well as coping strategies, experts saw resiliency as an important measure of student achievement. Educators need to explore "the introduction and use of resiliency-type training, and within our district that includes a resiliency program for at-risk students which I really feel is part of building healthy school communities" (M. Dean, May 30, 2013).

Success Indicators

High School Progression (Cognitive)

> *Being the principal of an alternate school, I have whole different goals in achievement of kids, such as making sure they achieve both educationally speaking when it comes to academics, but also in the way being fulfilled and fitting into society. But for most educators achievement would mean outcomes of the provincial curriculum.* (B. Tucker, June 5, 2013)

Fourteen interviewees (58%) acknowledged that traditionally high school progression has been an indicator of student achievement with graduation rates in particular being seen as important indicators: "students being academically successful often entails finishing school – graduating with a diploma" (M. Dean, May 30, 2013). Still, "graduation rates is a good indicator of how successful students are doing. But again, it's only one measure of how successful they are doing. Success will have multiple dimensions and should be measured as such" (Education Expert [EXP2], June 14, 2013). In this sense, a continuum of learning to address students' potential and unique strengths and weaknesses provides another means of assessing student achievement, achievement that may not always be accurately measured by standardized test scores. Such a continuum of learning often leads to graduation.

> *It's the ability of the student to move along a continuum of learning, whatever that learning might be and whatever it has to be because of what they bring to the school and what their life is like, with a goal that all kids should potentially graduate from high school and have the ability to go out and be independent. The goal for all students is that*

they do the best that they can, but achievement of these goals should be based whenever possible on the curriculum that takes a student to graduation. (J. Blais, June 11, 2013)

"Achievement is sort of a continuum. ... It's actually taking into account the context as well as the achievement or accomplishments. I think that's what people are definitely wanting to keep in mind" (E. Saewyc, May 29, 2013).

Identifying learning/achievement as a continuum is beneficial in determining measures of student achievement because this type of approach emphasizes the need to employ qualitative measures as well as quantitative ones. Bill Morrison, Co-Executive Director of Health and Education Research Group at UNB, problematized the term achievement in that, "The word achievement typically is a fairly limiting term; we like a wider range of variables around student aspects like student connectedness, student sense of competency, and progression" (B. Morrison, June 14, 2013).

Seeing student achievement as high school progression allows for the concept to be differentiated for diverse learners. In this way, the number of course credits achieved in various grades would be a measure of student achievement with course credit accumulation judged with respect to reasonable goals for individual students. Graduating with Honours might be a good measure of achievement for some students but not for others. In this fashion, drop-out rates become a measure of high school progression as high school drop-out rates are associated with limited class attendance, disengagement, and student disconnectedness with school. Preventing drop-out might be especially critical for particular groups who experience disproportional drop-out rates: "We have a fairly high rate of drop-outs before high school completion. It's particularly high in rural communities and among First Nations students and I think a significant

part of that is that students don't feel connected to schools" (Paula Pasquali, Executive Director of Wellness at the Government of Yukon, June 19, 2013).

High school progression may be a measure of possibilities beyond high school. As such, seven interviewees (29%) identified post-secondary aspirations as an indicator of student achievement, with three interviewees seeing the number of student applications to post-secondary institutions as a measure of student achievement: "It's telling how students are doing if they are applying for post-secondary studies because there are grade requirements for those applications" (Education Expert [ON], June 6, 2013).

Three interviewees acknowledged that the number of students who feel equipped to make a decision to pursue post-secondary studies and/or pursue a career goal after high school is indicative of their success. "If children are graduating and feel capable of pursuing more learning or doing something else after high school to give them a decent income that allows them to thrive in society healthily then they are a success" (Education Expert [ON], June 6, 2013). Furthermore, "kids who ask for help from school staff and who find that they were helped actually report greater post-secondary aspirations" (E. Saewyc, May 29, 2013). Supporting the decision-making process about post-secondary endeavours is important in all provinces and territories in Canada, but Merril Dean emphasized how critical it is in her jurisdiction (NWT):

> *I still have students who are trying to make decisions about, do I go out and live on the land as a career or do I become a miner. Those are very substantive differences and you need very different kinds of training to do those kinds of things.* (M. Dean, May 30, 2013)

As Kim Weatherby, who retired from working in School Health for the Ministry of Education in British Columbia, and is now doing consulting work with DASH-BC in British Columbia, stated:

"We need to prepare them [students] for their whole life, not just for a job or good academic success, but preparing them for their life" (K. Weatherby, May 28, 2013).

Student Participation (Behavioural)

> *Students who are able to interact socially with their peers, students that have hobbies and interests that appeal to them, that you're able to program around students strengths, that whole idea. That's what student achievement means to me – healthy, well-balanced students that are engaged.* (Education Expert [NWT], June 5, 2013)

Student participation can take many forms, both inside and outside of school. Students' participation in activities outside the classroom in school can serve as an indicator of student achievement (e.g., Arsenault [Education, PEI], Blais, Robinson). "Student achievement can include things like major accomplishments around sports and the arts" (E. Saewyc, May 29, 2013). Students who participate in extra-curricular activities seem to have better social skills, sustain more peer relationships, and display more positive social behaviours (Burnard, Carruthers [PEI], Coldbeck, Pasquali). Students' social behaviours are very telling about how they are doing and feeling: "How students are doing and feeling is influenced by several factors and is reflected in their social behaviours. Social-emotional wellness is definitely an important part of this holistic approach" (J. Burger, May 29, 2013).

Student leaders within these activities model positive social behaviours with their involvement as leaders encouraging their fellow students to participate. Such leadership may be crucial for health promotion in educational settings: "Many … boards that have been collecting feedback about healthy school initiatives mentioned how students who lead some of these initiatives seem to reach more students, seem to connect with them, and sell the idea that health

is important" (Education Expert [EXP2], June 14, 2013). Furthermore, student leaders are able to better "contribute to their school community as well as interact in a healthy and in a respectful way to students and teachers" (H. Christian, June 10, 2013). As such, school health endeavours have increasingly started to look toward "students engaged in healthy practices and self-directed projects, inquiry projects for school health." (K. Weatherby, May 28, 2013).

Eight interviewees (33%) acknowledged that students who participate in community activities (outside schools) participate in a different kind of learning that is an important measure of student achievement. Considering a more holistic understanding of student achievement to include students being well-rounded citizens fully and positively participating in society, Sterling Carruthers, School Health Specialist at the Department of Education and Early Childhood Development in PEI, explained the need for stakeholders to support community participation:

> *It's a broader view of student achievement; it's about students going through the school system and us supporting their academic achievement, their social, their artistic, their community volunteerism, all of that kind of full-rounded definition of what can we do as a school system/community involving families and other groups in supporting little Johnny and Suzy in becoming the best person they can be.* (S. Carruthers, June 11, 2013)

Elizabeth Coldbeck noted the interplay between participation in community activities while still in school and life-long healthy practices: "graduation rates are important, but students' feeling happy, well-rounded, and are able to contribute to society in meaningful ways during their time at school and after they graduate, those are measures of success" (E. Coldbeck, May 24, 2013).

Twelve experts mentioned peer relationships as a measure of student achievement. "Students who are able to interact socially with their peers, students who have hobbies and

interests that appeal to them, that you're able to program around student strengths. That's what student achievement means to me (Education Expert [NWT], June 5, 2013). While the number of friendships "may or may not be indicative of student success, the quality of friendships and daily interactions can most likely indicate more accurately" (Education Expert [ON], June 6, 2013).

Positive peer interactions can foster positive social behaviours among students and increase students' sense of belongingness. In classrooms promoting pro-social acts where the teacher is known to care, students relate to each other in a more positive fashion and attend more regularly (S. Burnard, June 10, 2013). Having teachers who genuinely care about students supports healthy relationship building not only among peers. Positive peer relationships can lead to decreased incidents of bullying and cyber bullying (e.g., Blais, Burger, Voysey).

Mental Health (Affective)

> *I think of the whole person. The social and emotional well-being of these students. I think of just everything – in order to be a healthy person, it has to take in every aspect of their lives.* (J. Voysey, June 11, 2013).

Twenty-one of the interviewees (87.5%) felt that mental health was an important aspect of student achievement. A sizable number of students are depressed. Students who are depressed are not able to commit fully to their academic studies (S. Burnard, June 10, 2013). Surveys continue to show a high level of stress, with students experiencing a wide range of challenges: "stress in achieving in school … issues around relationships and around substance use for the older kids … mental health, sexual health**,** relationships, safety around that … and issues around alcohol and substance use" (H. Christian, June 10, 2013). "With the release of the Mental Health Strategy last year, people are more cognizant of the role of mental health in relation to

achievement" (Education Expert [ON], June 6, 2013). Indeed, mental health may be a central tenet of Comprehensive School Health approaches, as "positive mental health and well-being are the foundation for everything else" (K. Weatherby, May 28, 2013).

An emotional connection to the classroom is a fundamental measure of mental health in the school setting. "Healthier students create a greater sense of connection to the school, both for the kids and the families, and creates better school achievement and healthier families" (M. Dean, May 30, 2013). Stacey Burnard detailed how the lack of such a connection, often a consequence of a depersonalized curricular approach to education, permeates all aspects of students' school experiences. She advocated a shift toward a delivery style that placed greater value on formative assessment, project-based learning, and personalized educational experiences for each child (May 30, 2013). Measures are being developed to examine emotional connection, such as the Student Orientation to School Questionnaire (SOSQ) in Alberta, as "there is too limited attention being paid to student affect in relationship to student achievement and high school completion. [The SOSQ] directly asks students about the affective relationship to schooling as a social dimension" (J. Burger, May 29, 2013).

Elizabeth Coldbeck discussed why students' emotional connections in a school setting were important for academic achievement. "If they are well-rounded, and feel happy in their environment, then they are more likely to be academically successful" (E. Coldbeck, May 24, 2013). She mentioned a specific tool that measures students' feelings of belongingness (Tell Them from Me) and its findings: "When they look at the Tell Them from Me survey, lots of schools are finding that a great majority of children feel that they don't have healthy relationships with adults in the school, they don't feel connected" (E. Coldbeck, May 24, 2013).

Environmental Indicators

Understanding of Comprehensive School Health (Cognitive)

> *I invite schools to participate and I do that in two ways, basically through a monthly newsletter that I hand out to schools and I have a whole bunch of email lists now of different groups of teachers and the newsletter would go directly to the school principals and it would go directly to different groups of teachers, it also goes to public health nurses, administration and the health authorities to try engage as many people as I possibly can … and I have a website that I keep up-to-date to try to get people the information that they might need to participate … to promote the healthy lifestyle.* (B. Allan, May 30, 2013)

Health and education experts acknowledged that it was important for key stakeholders to be aware of and understand healthy programs and policies. A highly structured, team-based, strategic approach promotes this kind of understanding

> *You had to have the superintendents and the principals from the schools where you were going to go into this approach, you had to have RCMP, you had to have the different health services type stuff, you needed to have all the community, so government and not-for-profit agencies that had anything to do with responding to the kids in those schools.* (M. Mancuso, June 20, 2013)

Thus students, teachers, administrators, parents, and community organizations all need access to knowledge about health-enhancing practices.

For students, the amount of knowledge about healthy practices gained from physical/health education curriculum and/or sexual health curriculum can serve as a measure of

student achievement. In Manitoba, the Youth Health Survey (YHS) provides that information provincially (K. McGarry). Such knowledge is additionally demonstrated in how "students' awareness about health issues are increasing and they [students] are becoming more vigilant about the food they eat and drink, how much exercise they do" (Education Expert [ON], June 6, 2013). To promote this knowledge, students need to see consistent messaging from adults, "making sure that their school policies and what they're doing is consistent with what is being taught with them or what is going on in the community becomes very influential in terms of the students' achievement" (M. Mancuso, June 20, 2013).

Teachers as role models are at the forefront of such messaging and so have to be current in their knowledge and understanding. "I've seen a kid look at a teacher who is drinking a pop and saying 'you know, really you should be having water'. So it becomes part of the norm and is talked about from that perspective. That's healthy" (M. Dean, May 30, 2013). The goal becomes "supporting healthy school environments for the students and staff to be able to achieve … to realize their full potential academically, developmentally, and emotionally" (H. Christian, June 10, 2013).

In this regard, administrators supply the leadership for healthy school initiatives to succeed. School administrators must have clearly "identified school and school division goals and visions" (Education Expert [EXP1], June 12, 2013). As a result of differences in school administrator leadership, "[the Health Promoting School approach] has a different look and feel in different areas depending on the school board … depending on the philosophy of the school board and how they've embraced the Health Promoting Schools model" (H. Christian, June 10, 2013).

Parents and community organizations can continue to promote healthy school practices beyond the school walls if they have the requisite knowledge and understanding. “Parental involvement in the health and well-being of children is of course important. Schools should not be held solely responsible for the health of students. It’s a joint responsibility” (Education Expert [ON], June 6, 2013). Bill Allan emphasized the need for parents to partake in health promotion activities in schools and at home.

> *I generally liaise between the health authorities … and the schools and education and school district … I try to marry the two and try and promote a healthy lifestyle … we often try and involve teachers and parents as well with it … mostly by offering these monthly initiatives and encourage participation with a variety of prizes for students and schools generally.* (B. Allan, May 30, 2013)

Adult Engagement (Behavioural)

> *There are many parents that have difficulty in knowing what to do or how to provide that [support]. So if schools can always operate from that premise, and really truly communicate with parents, not by saying it but by what they do and how they act – I think it opens relationships with the parents. And then what you see is sort of a deeper partnership – one where there can be honest conversations about struggles and situations and then the school can help to meet some of those needs of parents, or help the parent access other community services to support them.* (M. Dean, May 30, 2013)

It is not enough for multiple stakeholders in the realm of school health to know and understand the importance of health-enhancing behaviours; the concrete actions of adults (parents/families, school personnel, and community organizations) significantly influence what

students learn about healthy practices, how they feel about healthy practices, and how they partake in healthy practices.

One-third of the interviewees (8) mentioned that family involvement in promoting students' well-being is a measure of student achievement. While partnerships between parents/guardians and schools can be most beneficial to student success, "it doesn't really have to be that in-depth, but cooperation and an open respectful relationship between the families and the school also really makes a difference in terms of school health" (M. Dean, May 30, 2013). Mutual respect between families and schools can serve as a model for students on how to build healthy relationships. "Accurate indicators could be ... parental and/or family involvement and support and access to supports for both the student and his/her parents" (Education Expert (EXP1), June 12, 2013).

Six interviewees (25%) mentioned school administrator/teacher training and professional development as a factor that significantly influences numerous aspects of student achievement. "Accurate indicators could be ... teacher training and giving them pointers along the way on how to participate in relationship-building and building trust in the school community" (EXP1, June 12, 2013). Well-trained teachers are equipped with skills to provide opportunities/time for having positive interactions with students in the most efficient and professional ways possible. Making student information more accessible to teachers and principals will help them to connect with individual students, but understanding this information requires training. Teachers are "going to realize that the children have come from a very hard home life the night before and spending some time just talking to them and giving them a chance to just express their feelings" (J. Voysey, June 11, 2013). Tools like the Student Information System can contribute significantly

to teachers' professional development in terms of them learning to utilize a new electronic tool that can increase their understanding of students and possibly enrich teacher-student interactions. Through the Student Information System, teachers can "have a really clear understanding of who the student is and what their metacognitive approaches are to learning and how we can adjust pedagogy to support those specific profiles" (J. Burger, May 29, 2013).

Eleven interviewees mentioned the number of community organizations involved with health promotion/activities in schools combined with the level and/or type of organizations' involvement as a measure of student achievement. The CSH framework recognizes the role that community partnerships play in improving student health and student achievement. Many education and health experts (e.g., Coldbeck, Pasquali, Robinson) who were interviewed acknowledged that partnerships between schools and health-based community organizations are vital to improving student achievement.

> *I'm hoping that people will make the connection between, and not be limited in their view of health behaviour, and that they see it as more holistic. That they see that in order – I don't want them to see it as a program – I would like them to see it as a process that we have to go through. That to support schools in promoting the whole idea of CSH, everyone has a role to play. This is not necessarily something that is going to fall on the laps of teachers. The Department of Education has a role to play. I believe other community agencies have a role to play.* (Education Expert [NWT], June 5, 2013)

Inclusive School Environment (Affective)

> *We are dedicated to a rich experiential environment, particularly as we want to accommodate ... In Nunavut, it is in the law and in our practice that this is a bilingual*

> *educational environment, that this, within the largest land claim in the world, that Nunavut language and culture thrives within our system and form in all of our activities so even in terms of language and in terms of the inclusion of culture … well, not even the inclusion of culture, but making sure that schools are culturally relevant and that we have experiential activities that accommodate a variety of learning styles that all students have no matter where they are.* (C. Robinson, June 9, 2013)

Thirteen interviewees (54%) felt that an inclusive school environment was important for student achievement. An inclusive school environment is welcoming to all students, most particularly, those "students who are vulnerable or at-risk [where teachers] should be figuring a process of consultation and support for the child" (C. Robinson, June 9, 2013). These environments include taking care of students' physiological needs in addition to their academic and social needs (S. Burnard, June 10, 2013). An inclusive environment promotes and supports the learning of students to help them be the best they can be (C. Robinson, June 9, 2013).

Kim Weatherby works on "capacity building; in trying to build the capacity of the school system to support the positive mental health of the students and staff" (K. Weatherby, May 28, 2013). Capacity building creates an inclusive and supportive school setting where all staff and students can succeed. "When we show students that we care about them and not just about their results, then we create a better environment where students learn" (E. Coldbeck, May 24, 2013).

One way to measure an inclusive school environment is the level of school connectedness. "Comprehensive school health strategies have been shown to foster school connectedness, which especially has an important contribution around mental health for students" (E. Saewyc, May 29, 2013). "The focus on Social-Emotional Learning and

relationships within the school community is probably going to have the single largest effect on how connected students feel with the schools" (P. Pasquali, June 19, 2013). "I believe it's important for students to feel connected with their school and for their schools to connect with them" (Education Expert [ON], June 6, 2013). "Healthier students create a greater sense of connection to the school, both for kids and the families, and that creates better school achievement for them and healthier families" (M. Dean, May 30, 2013). Creating partnerships between the health and education sectors additionally provides the opportunity to foster a sense of connectedness between schools and the larger community, since the health sector tends to be outside schools. Health and education collaborations that support a CSH framework and student achievement can contribute to strengthening connections within a school community.

An inclusive school environment makes provisions for all students within the school. For example, for students who lack adequate food at home, food programs have "made a difference in some of the children getting to school. ... For some of our children, it's the only place that they're going to get a good meal" (J. Voysey, June 11, 2013). Greater emphasis could be placed on "diet quality and school performance, looking at the quality of student diet and how that contributes to overall school performance … students with healthier diets were less likely to fail that provincial achievement test or be more successful overall" (Education Expert (EXP3), June 4, 2013).

It is important to have students' physiological needs met before learning can take place (Burnard). The CSH approach encourages schools to ensure students are not trying to learn while they are hungry. Imelda Arsenault, Senior Director of Learning and Early Childhood

Development at the Department of Education and Early Childhood Development in PEI, highlighted the gains of school health policies in regards to healthy eating practices:

> *It's hard to correlate directly our student achievement scores … we kind of look at the whole student … our school health policy has helped students make better choices in their eating … it will affect the way they will work in the school … we have gains in student achievement in our province right now in literacy and numeracy … we have seen significant gains in our schools through our SHAPES survey … schools are definitely making better choices in healthy living … not just in schools but in the communities as well.* (I. Arsenault, July 2, 2013)

For students who do not thrive in traditional physical and health education classes, policy changes might prove beneficial: "We made a shift that students could get their credits toward high school graduation by doing other things. So, for example a student can get credit toward the physical education requirement by participating in a sport, doing activities outside the school, or go to the gym" (J. Blais, June 11, 2013). Physical activity opportunities can be "games, opportunities, and promoting games and play that don't necessarily cost, that don't necessarily have to be organized though to keep kids active and fit" (M. Dean, May 30, 2013). For Bill Allan, "schools that promote the three main objectives that we've been trying to move forward in the school district and that would be schools that try to achieve: better nutrition, more physical activity and a smoke-free environment" (B. Allan, May 30, 2013).

Finally, an inclusive school environment in CSH terms requires stakeholders buying-in to the link between school health practice and lifelong healthy practices. "Students, parents, teachers, staff, families, and district support need to buy in to the understanding that health and

student achievement are connected. You need to get people to understand what the steps in the process are" (E. Coldbeck, May 24, 2013). Buy-in is enhanced when activities are student-driven. "There is usually more buy-in when things are led by the students. Also, you don't get the backlash from parents, because you are able to say, 'this is what the students want'" (E. Coldbeck, May 24, 2013).

Educators need to buy in to healthy practices to increase student achievement. "They really understand and believe that the connections to and relationships at school make a difference. So, for many educators that's a buy-in" (K. Weatherby, May 28, 2013). Everyone must buy in to healthy practices, including educators. When people buy in to school health and everyone is participating, student achievement follows (S. Burnard, June 10, 2013).

Social Determinants

> *I help the schools if they are trying to write grants. Like, they write them to the Diabetes Association, to Healthy Children, to Brighter Futures to get things into the schools, to get food into the schools. There are all kinds of ways we can get food into the school through grants.* (J. Voysey, June 11, 2013)

No student, no school, and no community exists in a vacuum when it comes to Comprehensive School Health. The experts recognized the necessity of taking into account these social determinants when measuring the effects of CSH on the nine indicators.

Nine interviewees (38%) discussed **food security** issues and making sure that access to food was equitable and non-judgmental in the schools. "We also have to think about food security issues and not making the kids feel, those that are maybe a little food insecure and how

do we provide those foods at very affordable prices and we've really definitely tried to do that" (H. Christian, June 10, 2013).

Other students arrive at school **sleep** deprived. Students in the Yukon tend to stay out quite late, due to poor lifestyle choices (S. Burnard, June 10, 2013). An Education Expert (EXP1) noted that several students in secondary school have jobs after school. These students are often trying to manage a homework load with their job, resulting in insufficient sleep. "If they're tired when they write that test, or hungry, their test scores are going to drop. So you know, any tests you could take, you'd find the same thing – it wouldn't be an accurate measure of them" (J. Voysey, June 11, 2013).

Six interviewees acknowledged that the **socio-economic status** of the families to which students belong can play a pivotal role in student achievement. Students who belong to families with a low socio-economic status may have a poor diet, crowded spaces to sleep, loud places to do homework, less time spent with adults at home doing homework, and feelings of deprivation (objects and opportunities). The CSH approach could help compensate for the financial hardships to which some students are subjected because of their family's low socio-economic status; "Money is very tight in our communities, and we have many kids that are coming to school very hungry, and some of the best meals they're getting is when they come to school" (J. Voysey, June 11, 2013).

Access to technology is closely related to socio-economic status. Students' access to technology, especially Internet access and cell phones, influences student achievement. On the one hand, the Internet provides a substantial amount of knowledge about the world and can serve as a helpful tool that aids learning. Therefore, students who have Internet access readily available

in their homes are likely to be more informed citizens. However, an Education Expert (EXP1) noted that students who utilized the Internet and cell phones to socialize were more susceptible to becoming distracted from their academic work and/or become involved in cyber-bullying incidents, pornography consumption, and other at-risk activities that may result from their ready access to technology.

Four interviewees (17%) noted that **parents' educational attainment** influenced student achievement. While the four interviewees did not elaborate on this concept of parents' educational attainment, the suggestion was that students felt more motivated to perform well (especially academically) at school to follow in the footsteps of their parents' educational accomplishments. Additionally, parents might expect that their children achieve more [education] than they received.

Geographical location was mentioned as another social determinant. Achievement tends to be measured against the geographical locations of schools. "They've been linking things like indicators of school connectedness … and comparing those to postal code level health data" (K. Weatherby, May 28, 2013). An Education Expert (EXP1) explained that, if students live far away from their schools, this distance might mean that they spend a significant amount of time and energy traveling back and forth, and they might be less inclined to participate in school-related activities before and/or after school.

CHAPTER 4: RESEARCH SYNTHESIS

> *A comprehensive healthy school looks at all levels of health of a child and the stakeholders that are part of the school environment: sound nutritional policies, understanding nutritional needs, understanding what makes up a good nutrition and healthy eating patterns, healthy eating habits, appropriate physical fitness, physical activity levels, emotional health, positive health practices, anti-bullying and self-esteem building.* (B. Tucker, June 5, 2013)

Synthesizing the research from the scholarly literature, the grey literature, and the 24 interviews was an iterative process that involved refining our indicators and re-analyzing our data as we became more knowledgeable about the ideas contained within these three sources.

Analysis Process

We began with three broad domains (e.g., Barone & Eisner, 2012; Bloom, 1984; Brown & Latham, 2002; Guskey, 2013): cognitive, behavioural, and affective. These domains proved useful in dividing the literature for summarization. They helped in the first pass through the interview data as well. However, the interviews revealed substantial complexities that were lost when only three domains were considered. At this point, we examined the possibility of four indicators per domain. This classification focused solely on individual indicators. Yet seeing indicators only at the individual level missed key information, as it was apparent that our experts additionally saw indicators at the environmental level. Thus we created a classification scheme with 24 indicators (3 domains x 4 indicators/domain x 2 lenses [individual and environmental]). We wrote our interview analysis using these 24 indicators and revisited the literature review to

explain the research within this frame. Additional concepts in the interviews emerged as mediating factors, factors that affected the relationship between CSH and the indicators.

This initial classification scheme served as a springboard for discussion between the researchers and the members of the Research Advisory Working Group. This discussion brought ideas for how to make the concepts clearer and to create a stronger logic model for subsequent presentation of ideas.

The revised framework (see Table 13) still conceived of three domains (cognitive, behavioural, and affective) but combined these domains with three types of indicators (academic, success, and environmental), resulting in nine indicators. Mediating factors were renamed as social determinants. This new framework was generally received positively by the JCSH members we consulted. Tables 1-12 and their accompanying summaries were completely reworked to reflect the new framework. The presentation of the interview data in Chapter 3 was totally rewritten in light of the nine indicators and the social determinants. While all frameworks, including this one, have difficulties in making distinctions among categories (in this case, indicators) and the placement of concepts (in this case, measures) within categories, the current framework represents the scholarly literature, the grey literature, and the interview data in a parsimonious fashion that should be beneficial for policymakers, practitioners, and researchers—our three target stakeholder groups—to understand current thinking in the field.

Types of Indicators

Academic indicators

Academic indicators most closely represent academic achievement as an outcome of Comprehensive School Health initiatives. As such, achievement test scores (academic cognitive)

become the foremost indicator reflected in the research and in the interviews, as these scores most directly demonstrate academic achievement. Insofar as student achievement is viewed strictly as academic achievement, achievement test scores, most particularly as shown through *standardized* achievement test scores, remain the sole indicator of student success.

Academic indicators in the behavioural and affective domains gain prominence because of their connection to academic achievement. Attendance (academic behavioural), as seen in school records of absenteeism, truancy, and expulsions/suspensions, provides information about how consistently students are receiving instruction that should result in higher achievement test scores. Academic motivation (academic affective) in this sense is critical in shaping students' approaches to academic instruction and their subsequent academic achievement.

Success indicators

One of the key principles of Comprehensive School Health is the extension of student achievement beyond academic achievement, often referred to as student success. Success indicators recognize a more holistic view of student achievement. High school progression (cognitive) encompasses a range of possibilities beyond achievement test scores to measure student learning and cognitive development. Student participation (behavioural) relates to the engagement of students in the classroom, in the school, and in the community. Mental health (affective) refers to the presence of feelings of well-being, as young people flourish, and the absence of feelings of ill-being that keep them from thriving.

Environmental Indicators

Another key tenet of Comprehensive School Health is its settings approach. CSH is based on the philosophy that student success is predicated on the environment. This environment has

cognitive (understanding of comprehensive school health), behavioural (adult engagement), and affective (inclusive school environment) components. While many interventions reviewed and experts interviewed saw environment as a factor of CSH rather than as an indicator of CSH initiative efficacy, environment is both. While CSH aims to change student achievement through shifting the environment, its success is dependent on actually altering the environment. As such, environment becomes an indicator of (or at least precursor to/proxy for) student achievement.

Critical Insights

Working through this process brought us not only to a Common Indicators and Measures (CIM) framework but also to five critical insights about that framework's future use relating to the CSH four pillars, CSH philosophy, unit of analysis, statistical analyses, and research methods. First, insufficient attention has been paid in the literature to the CSH four pillars in that we found only one published study (Rivard et al., 2011) and three grey literature studies using all four pillars. Therefore, data are largely unavailable about the synergy across these pillars to inform a CIM framework. Second, the CSH philosophy is grounded in the belief that student achievement extends beyond academic achievement; yet much of the current research on CSH focuses too closely on the positive effects of CSH on academic achievement. To the extent that research continues this focus, CSH proponents need to present a stronger case for how research needs to measure how the CSH approach impacts the broader elements of student achievement

While the first two critical points relate to *what* we should study in regard to CSH, the final three points refer to *how* we should measure the nine indicators. First, the unit of analysis must be calibrated to the target of the initiative, the reach of the initiative, the length of the initiative, and the expected time for the initiative to take effect. A short-term initiative aimed at a

specific group within a school, for example, should not be expected to have any measurable, immediate effect on the school as a whole. Second, school leaders need to be wary of statistical analyses. These analyses can be affected by the specific sample (sample at time point A might have more girls than the sample at time B), seasonality (winter results differ from those in the spring), and mediating factors. In addition, conclusions cannot be reached about trends based on two time-points. Finally, to understand the full range of effects, mixed methods research is the best approach to provide a comprehensive picture of Comprehensive School Health.

In effect, we were unable to find a single study that adequately addressed the emerging vision of student achievement with respect to CSH as articulated by our interviewees. The studies almost always examined lone aspects related to school health (e.g., breakfast programs) rather than comprehensive school- or system-wide approaches to Comprehensive School Health. Such a lack, especially in the Canadian context, needs to be remedied.

Final Thoughts

As we move forward in understanding student achievement within a CSH approach, we must remember one important caveat. The most beautiful flower in the world may be the orchid, but orchids only grow from orchid seeds and only in a certain favourable climate that cannot be reproduced naturally in most locations (and certainly not in Canada). We cannot judge marigolds and zinnias and chyrsanthemums in relation to the beauty of orchids. So too it is with children. If we use the Common Indicators and Measures (CIM) framework as a mechanism through which we judge students based on whether or not they are orchids, most will be found lacking, although they may be quite amazing marigolds or zinnias or chrysanthemums. Besides which, a floral world populated completely by orchids would be quite boring.

REFERENCES

Ahamed Y. H., MacDonald, H., Reed, K., Naylor, P. J., Liu-Ambrose, T., & McKay, H. A. (2007). School-based physical activity does not compromise children's academic performance. *Medicine & Science in Sports & Exercise, 39,* 371-376. doi: 10.1249/01.mss.0000241654.45500.8e

Allday, R. A., & Yell, M. L. (2013). Learning difficulties in schools In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 79-81). New York, NY: Routledge.

American School Health Association. (2010). *What school administrators can do to enhance student learning by supporting a coordinated approach to health*. Kent, OH: American School Health Association. Retrieved from ERIC database (ED51684).

Anderson, L. W., Krathwohl, D. R., & Bloom, B. S. (2001). *A taxonomy for learning, teaching and assessing: A revision of Bloom's taxonomy of educational objectives* (Complete Edition). New York, NY: Longman.

Archambault, I., Janosz, M., Morizot, J., & Pagani, L. (2009). Adolescent behavioral, affective, and cognitive engagement in school: Relationship to dropout. *Journal of School Health, 79*, 408-415. doi: 10.1111/j.1746-1561.2009.00428.x.

Arthur, S., Barnard, M., Day, N., Ferguson, C., Gilby, N. … Purdon, S. (2011). *Evaluation of the National Healthy Schools Programme [NHSP]: Final report.* London, UK: National Center for Social Research. Retrieved from: http://www.natcen.ac.uk/study/evaluation-of-national-healthy-schools-programme

Askell-Williams, H., Lawson, M. J., Murray-Harvey, R., & Slee, P. T. (2005). *An investigation of the implementation of a MindMatters teaching module in secondary school classrooms*. Adelaide, Australia: Flinders University Press. Retrieved from: http://www.mindmatters.edu.au/verve/_resources/classroom_full.pdf

Bamgarner, E., & Brookes-Gunn, J. (2013). Socioeconomic status and student achievement. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 92-94). New York, NY: Routledge.

Barnekow, V., Buijs, G., Clift, S., Jensen, B. B., Paulus, P., Rivett, D., & Young, I. (2006). *Health promoting schools: A resource for developing indicators*. Geneva, Switzerland: World Health Organization. Retrieved from: http://www.euro.who.int/Document/E89735.pdf

Barone, T., & Eisner, E. W. (2012). *Arts based research*. Thousand Oaks, CA: Sage.

Barton, P. E., & Coley, R. J. (2009). *Parsing the achievement gap.* Princeton, NJ: Policy Information Center. Retrieved from: http://www.ets.org/Media/Research/pdf/PICPARSINGII.pdf

Basch, C. E. (2011). Healthier students are better learners: A missing link in school reforms to close the achievement gap. *Journal of School Health, 81*, 593-598. doi: 10.1111/j.1746-1561.2011.00632.x

Bassett-Gunter, R., Yessis, J., Manske, S., & Stockton, L. (2012). *Healthy school communities concept paper*. Ottawa, Ontario: Physical and Health Education Canada. Retrieved from: http://www.phecanada.ca/programs/health-promoting-schools/concept-paper

Battistich, V., Schaps, E., & Wilson, N. (2004). Effects of an elementary school intervention on students' "connectedness" to school and social adjustment during middle school. *Journal of Primary Prevention, 24*, 243-262. doi: 0278-095X/04/0300-0243/0

Baydala, L., Rasmussen, C., Birch, J., Sherman, J., Wikman, E. … Bisanz, J. (2009). Self-beliefs and behavioural development as related to academic achievement in Canadian Aboriginal children. *Canadian Journal of School Psychology, 24*(19), 19-33. doi: 10.1177/0829573509332243

Bishop, R. (2013). Indigenous and other minoritized students. In J. Hattie & E. M Anderman (Eds.), *International guide to student achievement* (pp.74-76). New York, NY: Routledge.

Bloom, B. S. (1956/1984). *Taxonomy of educational objectives book 1: Cognitive domain*. New York, NY: Longman. ISBN: 0-582-28010-9

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook 1: Cognitive domain*. New York, NY: Longmans.

Brotman, L. M., Calzada, E., Huang, K. Y., Kingston, S., Dawson-McClure, S. … Petkova, E. (2011). Promoting effective parenting practices and preventing child behaviour problems in school among ethnically diverse families from underserved, urban communities. *Child Development, 82*, 258-276. doi: 10.1111/j.1467-8624.2010.01554.x

Brown, T., & Latham, G. (2002). The effects of behavioural outcome goals, learning goals, and urging people to do their best on an individual's teamwork behaviour in a group problem-solving task. *Canadian Journal of Behavioural Science,* 34, 276-285. doi: 10.1037/h0087180

Burger, J. M., Nadirova, A., & Keefer, K. V. (2012). Moving beyond achievement data: Development of the student orientation to school questionnaire as a non-cognitive assessment tool. *Journal of Psychoeducational Assessment, 30*, 367-386. doi: 10.1177/0734282912449444

Capparelli, M. M. (2003). *Exploring the role of the school nurse in promoting student achievement: A discussion paper and final results of focus groups*. New York, NY: New York Statewide School Health Services Center. Retrieved from: http://www.schoolhealthservicesny.com/uploads/ExploringSchoolNurseRole.pdf

Castelli, D. M., Hillman, C. H., Buck, S. M., & Erwin, H. E. (2007). Physical fitness and academic achievement in third- and fifth- grade students. *Journal of Sport & Exercise Psychology, 29*, 239-252. PMID: 17568069

Children's Aid Society [CAS]. (2008). *21st century community learning centers at Children's Aid Society Community Schools*. New York, NY: Children's Aid Society. Retrieved from: http://www.aypf.org/documents/CASCommunitySchoolsEvaluationSummary.pdf

Clift, S., & Jensen, B. (2005). *The Health Promoting School: International advances in theory, evaluation and practice*. Copenhagen, Denmark: Danish Education University Press.

Conduct Problems Prevention Research Group [CPPRG]. (2009). Fast Track Prevention Trial for conduct problems**.** *Research Précis, 10*(1), 1-2. Retrieved from: http://www.designedinstruction.com/learningleads/fast-track-prevention.pdf

Connecticut Association of School Based Health Centers [CASBHC]. (2009). *School-based health centers enhance access to mental health services for adolescents, particularly African-American and Hispanic males*. Hartford, CT: Connecticut Association of School Based Health Centers. Retrieved from: http://www.innovations.ahrq.gov/content.aspx?id=3843

Creemers, B., & Kyriakides, L. (2010). School factors explaining achievement on cognitive and affective outcomes: Establishing a dynamic model of educational effectiveness. *Scandinavian Journal of Educational Research, 54,* 263-294.

Crooks, C.V., Chiodo, D., Thomas, D., & Hughes, R. (2010). Strengths-based programming for First Nations youth in schools: Building engagement through healthy relationships and leadership skills. *International Journal of Mental Health and Addiction, 8*, 160-173. doi: 10.1007/s11469-009-9242-0

Dilley, J. (2009). *Research review: School-based health interventions and academic achievement*. Washington, DC: Washington State Board of Health.

Dix, K. L., Slee, P. T., Lawson, M. J., & Keeves, J. P. (2011). Implementation quality of whole-school mental health promotion and students' academic performance. *Child and Adolescent Mental Health, 17*, 45-51. doi: 10.1111/j.1475-3588.2011.00608.x

Dotter, D. (2012). *Breakfast at the desk: The impact of universal breakfast programs on academic performance*. Retrieved from:

http://econweb.ucsd.edu/~ddotter/pdfs/Dotter_JMP_Manuscript.pdf

Fenzel, L. M. (2013). Achievement in faith-based schools. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp.128-130). New York, NY: Routledge.

Flay, B. R. (2002). Positive youth development requires comprehensive health promotion. *American Journal of Health Behaviour, 26*, 407-424. doi: x.doi.org/10.5993/AJHB.26.6.2

Florence, M. D., Asbridge, M., & Veugelers, P. J. (2008). Diet quality and academic performance. *Journal of School Health, 78*, 209-215. doi: 10.1111/j.1746-1561.2008.00288.x

Forehand, M. (2005). Bloom's taxonomy: Original and revised. In M. Orey (Ed.), *Emerging perspectives on learning, teaching, and technology*. Retrieved from http://projects.coe.uga.edu/epltt/

Freeman, J. G., Saab, H., King, M., & Gropp, K. (2011). *Health and health-related behaviours among young people in Yukon*. Whitehorse, YK: Yukon Government. Retrieved from: http://www.hss.gov.yk.ca/health_behaviours.php

Freeman, J. G., Samdal, O., Klinger, D. A., Dur, W., Griebler, R., Currie, D., & Rasmussen, M. (2009). The relationship of schools to emotional health and bullying. *International Journal of Public Health, 54*, 251-259. doi: 10.1007/s00038-009-5421-9

Frisvold, D. E. (2012). *Nutrition and cognitive achievement: An evaluation of the school breakfast program*. Atlanta, GA: Emory University Department of Economics. Retrieved from: www.econ.gatech.edu/files/seminars/FrisvoldSP2012.pdf

Froese-Germain, B., Riel, R., & Canadian Teachers' Federation. (2012). *Understanding teachers' perspectives on student mental health: Findings from a national survey*. Ottawa, ON: The Canadian Teachers' Foundation. ISBN: 978-0-88989-399-3

Gill, J. (2013). Gender Influences. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 36-38). New York, NY: Routledge.

Golley, R., Baines, E., Bassett, P., Wood, L., Pearce, J., & Nelson, M. (2010). School lunch and learning behaviour in primary schools: An intervention. *European Journal of Clinical Nutrition, 64*, 1280-1288. doi: 10.1038/ejcn.2010.150

Grieve, A. M. (2009). Teachers' beliefs about inappropriate behaviour: Challenging attitudes? *Journal of Research in Special Education Needs, 9*, 173-179. doi: 10.1111/j.1471-3802.2009.01130.x

Gu, Y. (2013). Second language vocabulary. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp.307-309). New York, NY: Routledge.

Guskey, T. R. (2013). Defining student achievement. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp.3-6). New York, NY: Routledge.

Harvard Family Research Project [HFRP]. (2008). *After school programs in the 21st century: Their potential and what it takes to achieve it.* Retrieved from: http://www.hfrp.org/publications-resources/browse-our-publications/after-school-programs-in-the-21st-century-their-potential-and-what-it-takes-to-achieve-it

Hattie, J., & Anderman, E. M. (2013). Introduction. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. xix-xxii). New York, NY: Routledge.

Hazell, T. (2006). *MindMatters: Evaluation of the professional development program and school-level implementation – final report*. Newcastle, Australia: Hunter Institute of Mental Health. Retrieved from: http://www.mindmatters.edu.au/verve/_resources/pd_final.pdf

Hinojosa, M., & Oshitoye, J. A. (2006). *Final report - Youth and Family Centers Program: 2005-2006*. Dallas, TX: Department of Evaluation and Accountability. Retrieved from: http://www.dallasisd.org/cms/lib/TX01001475/Centricity/Shared/evalacct/evaluation/final2007/EA06-143-2-Youth-and-Family-Centers-Program-signed.pdf

Hoglund, W. L., & Leadbeater, B. L. (2004). The effects of family, school, and classroom ecologies on changes in children's social competence and emotional and behavioural problems in first grade. *Developmental Psychology, 40*, 533-544. doi:10.1037/0012-1649.40.4.533

Huitt, W. G., Huitt, M. A., Monetti, D. M., & Hummel, J. H. (2009). *A systems-based synthesis of research related to improving students' academic performance*. Athens, Greece: Athens Institute for Education and Research.

Institute of Medicine [IOM]. (2013). *Educating the student body: Taking physical activity and physical education to school*. Washington, DC: National Academic Press. Retrieved from: http://www.nap.edu/catalog.php?record_id=18314

Jeynes, W. (2013). Resident and non-resident fathers. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 85-88). New York, NY: Routledge.

Katja, R., Päivi, A. K., Marja-Terttu, T., & Pekka, L. (2002). Relationships among adolescent subjective wellbeing, health behaviour, and school satisfaction. *Journal of School Health, 72*, 243-249. doi: 10.1111/j.1746-1561.2002.tb07337.x

Keeley, T. J. H., & Fox, K. R. (2009). The impact of physical activity and fitness on academic achievement and cognitive performance in children. *International Review of Sport and Exercise Psychology, 2*, 198-214. doi: 10.1080/17509840903233822

Kendall, P. R. W. (2003). *An ounce of prevention – A public health rationale for the school as a setting for health promotion: A report of the provincial health officer*. Victoria, BC: Ministry of Health Planning. ISBN: 0-7726-5029-2

Kidger, J., Araya, R., Donovan, J., & Gunnell, D. (2012). The effect of the school environment on the emotional health of adolescents: A systematic review. *Pediatrics, 129*, 925-949. doi: 10.1542/peds.2011-2248

Kidger, J., Donovan, J. L., Biddle, L., Campbell, R., & Gunnell. (2009). Supporting adolescent emotional health in schools: A mixed methods study of student and staff views in England. *BMC Public Health, 9*(403). doi: 10.1186/1471-2458-9-403

Kimber, B., Sandell, R., & Bremberg, S. (2008). Social and emotional training in Swedish schools for the promotion of mental health: An effectiveness study of 5 years of intervention. *Health Education Research, 23*, 931-940. doi: 10.1093/her/cyn040

Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. *Theory into Practice, 41*, 212-218. doi: 10.1207/s15430421tip4104_2

Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1964). *Taxonomy of educational objectives: The classification of educational goals. Handbook 11: The affective domain.* New York, NY: David McKay.

Kwak, L., Kremers, S. P. J., Bergman, P., Ruiz, J. R., Rizzo, N. S., & Sjostrom, M. (2009). Associations between physical activity, fitness, and academic achievement. *Journal of Pediatrics, 155,* 914-918. doi: 10.1016/j.jpeds.2009.06.019

Lassen, S. R., Steele, M. M., & Sailor, W. (2006). The relationship of school-wide Positive Behaviour Support [PBS] to academic achievement in an urban middle school. *Psychology in the Schools, 43,* 701-712. doi: 10.1002/pits.20177

Latham, G. P., Mitchell, T. R., & Dossett, D. L. (1978). The importance of participative goal setting and anticipated rewards on goal difficulty and job performance. *Journal* of *Applied Psychology, 63,* 163-171. doi: 10.1037//0021-9010.63.2.163

Lee, A., Cheng, F., Fung, Y., St. Leger, L. (2006). Can health promoting schools contribute to the better health and well-being of young people: Hong Kong experience? *Journal of Epidemiology and Community Health, 60,* 530–536. doi: 10.1136/jech.2005.040121

Levin, H. M., & Soler, P. (2013) Acceleration for all. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 209-211). New York, NY: Routledge.

Limerick Health Promotion. (2008). *Health Impact Assessment [HIA] of early school leaving, absenteeism and truancy.* Limerick, Ireland: Limerick Health Promotion. Retrieved from: http://www.publichealth.ie/files/file/Hia%20ESL%20NEWdoc09.pdf

Little, P. M. D., Wimer, C., & Weiss, H. B. (2008). After school programs in the 21st Century: Their potential and what it takes to achieve it. *Harvard Family Research Project, 10,* 112. Retrieved from: http://www.hfrp.org/publications-resources/browse-our-publications/after-school-programs-in-the-21st-century-their-potential-and-what-it-takes-to-achieve-it

Maller, C. J. (2009). Promoting children's mental, emotional and social health through contact with nature: A model. *Health Education, 109,* 522-543. doi: 10.1108/09654280911001185

McEachin, A. J., & Brewer, J. (2013). Teacher intelligence: What is it and why do we care? In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 254-256). New York, NY: Routledge.

Murray, N. G., Low, B. J., Hollis, C., Cross, A. W., & Davis, S. M. (2007). Coordinated school health programs and academic achievement: A systematic review of the literature. *Journal of School Health, 77,* 589-600. PMID: 17970862

Ni Mhurchu, C., Turley, M., Gorton, D., Jiang, Y., Michie, J., Maddison, R., & Hattie, J. (2012). Effects of a free school breakfast programme on children's attendance, academic achievement and short-term hunger: Results from a stepped-wedge, cluster randomized controlled trial. *Journal of Epidemiology and Community Health.* doi: 10.1136/jech-2012-201540

Osher, D., Poirier, J. M. Dwyer, K. P., Hicks, R., Brown, L. J., Lampron, S., & Rodriguez, C. (2008). *Cleveland metropolitan school district human ware audit: Findings and recommendations*. Washington, DC: American Institutes for Research. Retrieved from ERIC database (ED502432).

Pan-Canadian Joint Consortium for School Health [JCSH]. (2009). Joint Consortium for School Health Newsletter. *Joint Consortium for School Health, 3*(1), 1-5. Retrieved from: http://www.jcsh-cces.ca/upload/JCSH%20newsletter_Feb_EN_VOL3_1.pdf

Pan-Canadian Joint Consortium for School Health [JCSH]. (2012). *Joint Consortium for School Health annual report*. Summerside, PE: Joint Consortium for School Health. Retrieved from: http://www.jcshcces.ca/upload/JCSH_AnnualReport%202012%20English%20WebReady.pdf

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*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning. Retrieved from: http://casel.org/wp-content/uploads/PackardTR.pdf

Puskar, K. R., & Bernardo, L. M. (2007). Mental health and academic achievement: Role of school nurses. *Journal for Specialists in Pediatric Nursing, 12*, 215-223. PMID: 17956370

Queensland Health. Education Queensland, Brisbane Catholic Education Centre, & Association of Independent Schools. (2005). *How to conduct a school health audit: Booklet 7*. Queensland, Australia: Queensland Health, Education Queensland, Brisbane Catholic Education Centre and Association of Independent Schools. Retrieved from: http://www.health.qld.gov.au/healthyschools/documents/29338.pdf

Reback, R. (2010). Schools' mental health services and young children's emotions, behavior, and learning. *Journal of Policy Analysis and Management, 29,* 698-725. doi: 10.1002/pam.20528

Richmond, A. M., Smith, D., & The Wabano Centre for Aboriginal Health. (2012). Sense of belongingness in urban school environments of Aboriginal youth. *The International Indigenous Policy Journal, 3,* 1 - 17. Retrieved from http://ir.lib.uwo.ca/iipj/vol13/iss1/1

Rivard, M., Deslandes, R., & Beaudoin, C. (2011). Collaboration within the context of the Healthy School Approach (HSA): The case of a disadvantaged elementary school in Quebec. *Canadian Journal of Education, 34,* 158-176. PMID: 0380-2361

Roots of Empathy [ROE]. (2010). *Roots of Empathy 2010 feedback report New Brunswick.* Fredericton, NB: Roots of Empathy. Retrieved from: http://www.rootsofempathy.org/documents/content/ROE_New_Brunswick_Feedback_Report_2009-10.pdf

Saab, H., Klinger, D., & Shulha, L. (2009). *The health promoting school: Developing indicators and an evaluation framework.* Ottawa, ON: Canadian Council on Learning. Retrieved from: http://www.ccl-cca.ca/pdfs/fundedresearch/Saab-FinalReport.pdf

Saksvig, B. I., Gittelsohn, J., Harris, S. B., Hanley, A. J. G., Valente, T. W., & Zinman, B. (2005). A pilot school-based healthy eating and physical activity intervention improves diet, food knowledge, and self-efficacy for native Canadian children. *Journal of Nutrition, 13,* 2392-2398. PMID: 16177202

Schraw, G., Brownlee, J., & Olafson, L. (2013). Teachers' epistemological beliefs and achievement. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 268-270). New York, NY: Routledge.

Sherblom, S. A., Marshall, J. C., & Sherblom, J. C. (2006). The relationship between school climate and math and reading achievement. *Journal of Research in Character Education, 4*(1/2), 19-31. PMID: 1543-1223

Sibley, B. A., & Etnier, J. L. (2003). The relationship between physical activity and cognition in children: a meta-analysis. *Pediatric Exercise Science, 15,* 243–256. PMID: 08998493

Slee, P. T., Lawson, M. J., Russell, A., Askell-Williams, H., Dix, K. L. … Spears, B. A. (2009). *KidsMatter: Primary evaluation final report***. Adelaide,** South Australia: Flinders University Centre for Analysis of Educational Futures.

Stead, R., & Nevill, M. (2010). *The impact of physical education and sport on education outcomes: A review of literature*. Leicestershire, UK: Institute of Youth Sport School of Sport, Exercise and Health Sciences. Retrieved from: https://secure.ausport.gov.au/__data/assets/pdf_file/0010/456904/Nevill_-_Literature_review_Impact_of_PE_and_sport_on_education_outcomes_Oct_2010.pdf

Stewart-Brown, S. (2006). *What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach?* Copenhagen, Denmark: WHO Regional Office for Europe. Retrieved from: http://www.euro.who.int/document/e88185.pdf

Storey, H.C., Pearce, J., Ashfield-Watt, P. A. L., Wood, L., Baines, E., & Nelson, M. (2011). A randomized controlled trial of the effect of school food and dining room modifications on classroom behaviour in secondary school children. *European Journal of Clinical Nutrition, 65*, 32-38. doi: 10.1038/ejcn.2010.227

Stufflebeam, D. L. (1971). *Education evaluation and decision making*. Itasca, IL: Peacock.

Suhrcke, M., & de Paz Nieves, C. (2011). *The impact of health and health behaviours on educational outcomes in high-income countries: A review of the evidence*. Copenhagen, Denmark: World Health Organization. ISBN: 978 92 890 0220 2

Tanner, C. K. (2013). Influences of school layout and design on student achievement. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 137-139). New York, NY: Routledge.

Taxbock, K. (2009). *The Alberta Coalition for Healthy School Communities [ACHSC] – Evaluation report 2008/09.* Edmonton, AB: Alberta Coalition for Healthy School Communities. Retrieved from: http://www.achsc.org/download/2009/ACHSC%202008-09%20Evaluation%20Report.pdf

Tayler, C. (2013). Entry to school. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 25-27). New York, NY: Routledge.

Torrence, M., & Fidalgo, R. (2013). Writing achievement. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 338-340). New York, NY: Routledge.

US Department of Health and Human Services, Centre for Disease Control and Prevention [CDC]. (2010). *The association between school-based physical activity, including physical education, and academic performance.* Retrieved from http://www.cdc.gov/healthyyouth/health_and_academics/pdf/pa-pe_paper.pdf

Veugelers, P. J., & Schwartz, M. E. (2010). Comprehensive school health in Canada. *Canadian Journal of Public Health, 101*(8), S5-S8. Retrieved from http://search.proquest.com/docview/763187213?accountid=6180

Wood, J. J. (2006). Effect of anxiety reduction on children's school performance and social adjustment. *Developmental Psychology, 42*, 345-349. doi:10.1037/0012-1649.42.2.345

Xu, J. (2013). Homework and academic achievement. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 199-201). New York, NY: Routledge.

Young, I. (2005). Health promotion in schools: A historical perspective. *Promotion and Education, 12*, 112–117. doi: 10.1177/10253823050120030103

APPENDIX A: NAMES OF HOLISTIC SCHOOL HEALTH STRATEGIES ACROSS CANADIAN PROVINCES AND TERRITORIES

Province/ Territory	**Alberta**	**British Columbia**	**Manitoba**	**New Brunswick**	**Newfoundland & Labrador**	**Northwest Territories**	**Nova Scotia**	**Nunavut**	**Ontario**	**Prince Edward Island**	**Quebec**	**Saskatchewan**	**Yukon**
Name of school health framework	CSH	CSH	Healthy Schools	CSH	CSH	CSH	Health Promoting Schools	CSH	Healthy Schools	CSH	Healthy Schools; CSH	Comprehensive School Community Health	CSH
Name of School Health Strategy	*Healthy Schools Alberta*	*Healthy Schools BC*	*Manitoba Healthy Schools*	*Wellness Strategy—Healthy Schools*	*Healthy Students, Healthy Schools*	*NWT Health Curriculum/ School Health Program*	*Health Promoting Schools Initiative*	*Note: Not explicitly named.*	*Healthy Schools Strategy*	*Note: Not explicitly named.*	*Healthy Schools* – For the educational success, health and well-being of young people.	*Comprehensive School Community Health Approach*	*Healthy Schools: Pathways to Wellness*
Provincial/ territorial electronic source	http://www.education.alberta.ca/media/1124068/framework_kto12well.pdf	http://healthyschoolsbc.ca/csh/what-is-a-healthy-school.aspx	http://www.gov.mb.ca/healthyschools/docs/healthyschoolsbooklet2011.pdf	http://www.gnb.ca/0131/wellness_sch-e.asp	http://www.health.gov.nl.ca/health/wellnesshealthyliving/healthystudents.html	http://www.ece.gov.nt.ca/early-childhood-and-school-services/school-services/curriculum-k-12/health	http://www.gov.ns.ca/hpp/healthy_development/health-promoting-schools.asp	http://www.jcsh-cces.ca/upload/School%20Health%20Promotion%20in%20Nunavut.pdf	http://www.edu.gov.on.ca/eng/healthyschools/helpcreate.html	http://www.gov.pe.ca/eecd/index.php3?number=1028301&lang=E	http://www.mels.gouv.qc.ca/dgfj/csc/promotion/pdf/19-7062-01a.pdf	http://www.education.gov.sk.ca/comprehensive-school-community-health	http://www.yukonwellness.ca/healthyschools.php#.Ub9kcZydGM8

APPENDIX B: INTERVIEWEES

Province/Territory	Interviewee	Position & Organization	Area of Expertise	Interviewed
Alberta (AB)	John Burger	Director of Schools with Responsibilities for Data and Analytics, Rocky View School Division	Education (Research, practice)	May 29, 2013
Alberta (AB)	Elizabeth Coldbeck	Project Coordinator at Alberta Healthy Schools Community Wellness Fund, U of A	Health/Education (Research, policy)	May 24, 2013
British Columbia (BC)	Elizabeth Saewyc	Professor, School of Nursing and Adolescent Health, University of British Columbia	Health/Education (Research, practice)	May 29, 2013
British Columbia (BC)	Kim Weatherby	Retired from the School Health Division, BC Ministry of Education; Consultant at DASH – BC	Health/Education (Policy, practice)	May 28, 2013
Manitoba (MB)	Kate McGarry	Project Coordinator at Cancer Care Manitoba	Health (Research)	July 2, 2013
Manitoba (MB)	Joanna Blais	Director of Student Services, Manitoba Education	Education (Policy, practice)	June11, 2013
New Brunswick (NB)	Michelina Mancuso	Executive Director of Performance Measurement, New Brunswick Health Council	Health/Education (Policy, research)	June 20, 2013
New Brunswick (NB)	Bill Morrison	Co-Executive Director of Health and Research Group, University of New Brunswick	Education/Health (Policy)	June 14, 2013
Newfoundland & Labrador (NL)	Bill Allan	School Health Liaison Consultant in Newfoundland & Labrador, Western School District	Health/Education (Practice)	May 30, 2013
Newfoundland & Labrador (NL)	Bill Tucker	President of the Canadian Association of Principals, Eastern School District	Education (Policy)	June 5, 2013
Nova Scotia (NS)	Heather Christian	Former Director of Healthy Development, Nova Scotia Government	Health/Education (Policy)	June 10, 2013
Northwest Territories (NWT)	Merril Dean	Coordinator of Student Services, Yellowknife Catholic Schools	Education (Practice)	May 30, 2013
Northwest Territories (NWT)	Expert (NWT)	Department of Education, Culture, and Employment	Education (Practice, policy)	June 5, 2013
Nunavut (NU)	Cully Robinson	Superintendent of Schools, Kivalliq School Operations, Department of Education, Nunavut	Education (Practice)	June 9, 2013
Nunavut (NU)	Jean Voysey	Student Support Consultant, Kitikmeot School Operations	Education (Practice)	June 11, 2013
Ontario (ON)	Expert (ON)	Student Achievement Division, Ontario Ministry of Education	Education (Policy, research)	June 6, 2013
Prince Edward Island (PEI)	Imelda Arsenault	Senior Director, Learning and Early Childhood Development	Education (Policy, practice, research)	July 2, 2013
Prince Edward Island (PEI)	Sterling Carruthers	School Health Specialist, Department of Education and Early Childhood Development	Education/Health (Practice, policy)	June 11, 2013
Yukon (YT)	Stacey Burnard	Social-Emotional Learning Consultant, Yukon Education	Health/Education (Policy, practice)	June 10, 2013
Yukon (YT)	Paula Pasquali	Executive Director, Pathways to Wellness, Government of Yukon	Health (Policy, practice)	June 19, 2013
Unspecified	Expert (EXP1)	N/A	Education (Policy, practice)	June 12, 2013
Unspecified	Expert (EXP2)	N/A	Education (Policy, practice)	June 14, 2013
Unspecified	Expert (EXP3)	N/A	Education/Health (Research, policy)	June 4, 2013
Unspecified	Expert (EXP4)	N/A	Health (Practice)	June 11, 2013

APPENDIX C: SCHOLARLY LITERATURE IN THE COGNITIVE DOMAIN

1. Title	**School-based physical activity does not compromise children's academic performance**
Authors, publication date, DOI #/PMID, ISBN	Ahamed, Macdonald, Reed, Naylor, Liu-Ambrose, & McKay, 2007 10.1249/01.mss.0000241654.45500.8e
CSH Pillar(s)	Teaching and Learning, Healthy School Policy
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Standardized test scores
Methodology	Mixed methods study
Location(s)	British Columbia, 
School Level	Elementary schools
Purpose of Evaluation	The purpose of this study was twofold: 1) to evaluate the effectiveness of a school-based physical activity intervention, Action Schools! BC (AS! BC), for maintaining academic performance in a multiethnic group of elementary children, and 2) to determine whether boys and girls` academic performance changed similarly after participation in AS! BC.
Sample Population	Students, teachers, parents
Research Instrument(s)	Canadian Achievement Test (CAT-3) to evaluate academic performance (TotScore), weekly teacher activity logs, Physical Activity Questionnaire for Children (PAQ-C), health history questionnaires
Method	- a 16-month cluster randomized controlled trial - 8 elementary schools (6 intervention schools and 2 control schools) - **n=287** students in Grades 4 and 5: 143 boys, 144 girls - used a mixed linear model to evaluate group differences in TotScore at follow-up - parents completed a health history questionnaire for their child, including child ethnicity - baseline measures for height, body mass, and physical activity were acquired in February through March 2003, before the start of the intervention; height, body mass, and physical activity and baseline measures of academic performance were assessed in June 2003 - academic performance was evaluated across one school year, and measures were taken at the end the academic year (June 2003 and June 2004)
Key Findings	- students attending control schools had significantly higher baseline TotScores than those attending intervention schools; despite this initial difference, there was no significant difference in TotScore between groups at follow-up - students attending intervention schools undertook an additional 50 min of physical activity per week, on average, compared with students attending control schools; despite this increase in scheduled physical activity, academic performance total test scores were not significantly different between intervention groups at final measurement
Strengths	- Multiple perspectives - compared baseline and follow-up data for academic performance and physical activity
Weaknesses	- researchers were unable to directly assess socioeconomic status among schools, although socioeconomic status may influence academic standing of schools - this study was over the course of one academic year; examining changes as a result of the program would entail extending the time of the study

2. Title	**Physical fitness and academic achievement in third- and fifth- grade students**
Authors, publication date, DOI #/PMID, ISBN	Castelli, Hillman, Buck, & Erwin, 2007 17568069
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments, Healthy School Policy
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Standardized State Test
Methodology	Quantitative methods study
Location(s)	Illinois
School Level	Elementary schools
Purpose of Evaluation	To assess the effect of physical fitness on academic achievement. This study was based upon the program SPARK (Sports, Play, Active Recreation for Kids), which intended to increase PA to improve academic achievement and fitness and motor skills.
Sample Population	Students
Research Instrument(s)	-Illinois Standards Achievement Test- (ISAT) Academic tests -Aerobic Fitness, BMI -Illinois School Report Card -Fitness Testing: Fitnessgram (Cooper Institute for Aerobics Research, 1999), http://www.fitnessgram.net/home/
Method	-Grade 3 and Grade 5 students (n=259) participated from 4 elementary schools -Fitnessgram physical fitness test (aerobic capacity, muscle fitness, flexibility, and BMI) over 3 PA classes -Illinois Standards Achievement Test (ISAT) conducted annually over 5 days in 40- minute intervals
Key Findings	-aerobic fitness was positively associated with academic achievement (in math and reading), while BMI was negatively associated with academic achievement -strength and flexibility were unrelated to academic achievement -sociocultural factors (e.g., age, sex, school characteristics, and poverty index) did not affect physical fitness level or academic achievement
Strengths	-objective measures of academic achievement and physical fitness -warrants further evaluation of physical education programs and policies (e.g., lesson content, frequency, and quality) to enhance benefits of the program
Weaknesses	-no control group used; non-random -small sample size -no indication of cause and effect between physical fitness and academic achievement -more accurate measures of aerobic fitness would use maximum aerobic consumption (VO2 max)

3. Title	**Implementation Quality of Whole-School Mental Health Promotion and Students' Academic Performance**
Authors, publication date, DOI #/PMID, ISBN	Dix, Slee, Lawson, & Keeves, 2011 10.1111/j.1475-3588.2011.00608.x
CSH Pillar(s)	Social and Physical Environments, Healthy School Policy
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Standardized Test Scores in Literacy and Numeracy
Methodology	Quantitative methods study
Location(s)	Australian States
School Level	Elementary schools
Purpose of Evaluation	To explore change in standardized academic performance across the 2-year implementation of a mental health initiative (KidsMatter*) in 96 Australian primary (or elementary) schools that was focused on improving student social-emotional competencies. *http://www.kidsmatter.edu.au/primary
Sample Population	Students, Teachers, Families, School Leadership
Research Instrument(s)	Questionnaires KidsMatter Implementation Index Index of Community SocioEducational Advantage (ICSEA) Australian National Assessment Program- Literacy and Numeracy (NAPLAN)
Method	-Hierarchical Linear Modelling -100 schools selected to achieve representation in location (metro, rural, remote), size, and sector (Catholic, independent, public) -random stratified sample of up to 76 students in each of the 100 schools, giving preference to students aged 10 years, who were the focus of KidsMatter intervention -during the 2 years of the KidsMatter trial (2007/08), questionnaires were administered to students' teachers on four occasions and to parents on three occasions -in addition, data were received from school leadership at the end of the trial and in regular progress reports related to each site provided throughout the trial by eight state-based KidsMatter project officers
Key Findings	The results do not indicate unequivocally that KidsMatter was lifting student performance. However, schools that implemented KidsMatter properly also had improved learning outcomes for students, equivalent to 6 months more schooling by Year 7, after controlling for the influence of socioeconomic background Over the 2-year evaluation, 14% more teachers strongly agreed that 'KidsMatter had led to improvements in this student's schoolwork'. This was used as an indirect indicator of achievement
Strengths	-comprehensive sample -longitudinal study
Weaknesses	-Academic performance was measured indirectly through teachers' perception of improvements in students' schoolwork based on the intervention -Further research is needed to bring together measures of social-emotional competency, implementation quality, and standardized academic performance at the student level -quality of implementation should be happening as an essential and regular part of any intervention and not just assessed at the end of the initiative–as it did here

4. Title	**Diet Quality and Academic Performance**
Authors, publication date, DOI #/PMID, ISBN	Florence, Asbridge, & Veugelers, 2008 10.1111/j.1746-1561.2008.00288.x.
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Literacy Assessment- Standardized test
Methodology	Quantitative methods study
Location(s)	Nova Scotia, Canada 
School Level	Elementary schools
Purpose of Evaluation	This paper focuses on the importance of nutrition, specifically overall diet quality, to academic performance
Sample Population	Grade 5 students
Research Instrument(s)	Children's Lifestyle and School-performance Study (CLASS), 2003 Modified Harvard Youth/Adolsecent Food Frequency Questionnaire (YAQ) Diet Quality Index (DQI-I) Healthy Eating Index (HEI) Elementary Literacy Assessment- Standardized test administered by the Nova Scotia Department of Education (Fall, 2003)
Method	282 Nova Scotia public schools with Grade 5 classes participated in the recruitment of participants by distributing a consent form and short survey to parents Parental consent was received for 5517 students (51.1% response rate per school) Trained CLASS representatives administered survey on children's activities and the YAQ Height and weight were measured
Key Findings	-Dietary adequacy and variety were identified as specific aspects of diet quality important to academic performance, thereby highlighting the value of consuming a diverse selection of foods in order to meet the recommended number of servings from each food group. -This study extends current knowledge in this area (previously limited to hunger, malnutrition, micronutrient deficiency, and the effects of breakfast on nutrition) by demonstrating the independent importance of overall diet quality to academic performance and by identifying specific dietary factors that contribute to the association between nutrition and academic performance. -Regardless of socioeconomic factors, diet quality is important to academic performance. -These findings support the broader implementation and investment in effective school nutrition programs that have the potential to improve student's diet quality, academic performance, and, over the long term, their health.
Strengths	Accounted for SES variables Few research studies have examined the effect of overall diet quality on the academic performance of children, as opposed to specific effects of nutrition on health and school performance
Weaknesses	DQI-I may be more in line with US recommendations, and therefore, DQI-I interpretations should be carefully interpreted in other countries where dietary recommendations are based on existing food patterns that are different from those in the US.

5. Title	**The impact of physical activity and fitness on academic achievement and cognitive performance in children**
Authors, publication date, DOI #/PMID, ISBN	Keeley & Fox, 2009 10.1080.17509840903233822
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Standardized tests, recognized and validated test of cognitive function
Methodology	Review synthesis
Location(s)	International
School Level	Elementary, middle, and secondary schools
Purpose of Evaluation	This review attempted to take a systematic and rigorous approach to the identification, selection, and interpretation of reviews of literature relating to effects of physical activity on academic and cognitive performance.
Sample Population	Children and/or adolescents, without learning disorders or special needs aged between four and 18 years
Research Instrument(s)	Databases of MEDLINE, PSYCHINFO, Cochrane data base, Google Scholar, and ERIC Inclusion and Exclusion criteria Data Extraction
Method	Three-step search method was used to identify studies meeting inclusion criteria that investigated the relationship between physical activity or physical fitness and cognitive performance or academic achievement Three selected prominent authors in the field were contacted to identify relevant papers 17 studies satisfied inclusion criteria
Key Findings	-There is only a small amount of research published with appropriately rigorous measurement and adequate study design. Intervention designs are needed. -Majority of studies were cross-sectional and correlational in design and these produced weak positive associations at best. -Based on five cross-sectional studies, a weak relationship may exist between total daily physical activity and academic achievement with no intervention studies to support this finding. -There is no consistent evidence to demonstrate that increasing curricular-based physical activity improves academic achievement. -However, where physical activity has replaced academic time in the curriculum in primary schools, there is no evidence of a detrimental effect on academic achievement.
Strengths	An objective summary of the state of knowledge
Weaknesses	Only studies until 2009 included

6. Title	**Associations between Physical Activity, Fitness, and Academic Achievement**
Authors, publication date, DOI #/PMID, ISBN	Kwak, Kremers, Bergman, Ruiz, Rizzo, & Sjostrom, 2009 10.1016/j.jpeds.2009.06.019
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Individual written marks for 17 subjects
Methodology	Quantitative methods study
Location(s)	Sweden
School Level	Secondary schools
Purpose of Evaluation	This study explored the associations between objectively assessed light-, moderate-, and vigorous-intensity levels of physical activity and academic achievement, while accounting for several demographic, social, environmental, and biological factors. Additionally, researchers tested whether cardiovascular fitness was a mediator in the association between physical activity and academic outcomes.
Sample Population	Children (9 to 10 years old), Adolescents (15 to 16 years old)
Research Instrument(s)	Individual written marks for 17 school subjects Physical Activity was measured with an accelerometer (model WAM 7164) Cardiovascular fitness was measured with a bicycle ergometer (Monark 829E)
Method	Data for this study came from the Swedish part of the European Youth Heart Study. A total of 1137 pupils (49%) agreed to participate and provided with written informed consent by 1 of the parents or legal guardians; additionally all pupils gave verbal consent Biological variables were measured: sex, age, pubertal phase, sum of skinfolds. Physical Activity was measured with an accelerometer; cardiovascular fitness was measured with a bicycle ergometer; heart rate was measured through a Polar heart rate monitor. Exhaustion was categorized by a subjective assessment of the observer.
Key Findings	Vigorous physical activity was the only intensity level that significantly correlated with academic achievement, and only in girls.
Strengths	-Academic achievement, physical activity, cardiovascular fitness, sum of skin-folds, and pubertal phase were all measured objectively and were not based on self-report as in many previous studies. -Study sample seems to be a representative sample regarding academic achievement; the higher sum of school grades observed in this study for girls in comparison to boys corresponds with national Swedish data. -The incorporation of several potential confounders, such as social economic status, family structure, and parental monitoring, which have not all been included in previous research on this topic.
Weaknesses	-Cross-sectional design limits the possibility to draw conclusions regarding the causality of any of the observed relationships. -The use of accelerometers, as they are limited in capturing any activities with little displacement of the body, such as cycling and snowboarding.

7. Title	**Collaboration within the Context of the Healthy School Approach (HSA): The Case of a Disadvantaged Elementary School in Quebec**
Authors, publication date, DOI #/PMID, ISBN	Rivard, Deslandes, & Beaudoin, 2011 0380-2361
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments, Healthy School Policy, Partnerships and Services
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	School-family-community collaboration
Methodology	Qualitative methods study
Location(s)	Quebec 
School Level	Elementary schools
Purpose of Evaluation	To describe the perceptions of the stakeholders (students, educators, parents, and community members) with regard to the place of health in the school setting. To identify health-related practices or actions conducted by educators and parents in view of better school-family-community collaboration in the deployment of the Healthy Schools Approach (HAS).
Sample Population	Students, Educators, Parents, Community members
Research Instrument(s)	Group Discussion
Method	-Qualitative data from participants' comments were recorded, transcribed, and analyzed using L'Ecuyer's method (1990) for mixed content analysis -The analysis was conducted using a coding scheme (Karsenti & Savoie-Zajc, 2004), which incorporated the categories of both theoretical models -Participant comments were classified independently by two members of the research team Students (n=12) Educators (n=7) Parents (n=6) Community members (n=6)
Key Findings	The four groups of participants seemed to be unanimously in favour of physical activity and healthy eating habits included in the formal and informal curricula and recess supervision. Hoover-Dempsey et al.'s (1997, 2010) model also used in this study has highlighted parents' and educators' practices that attempt to influence students, provide them with encouragement, and exercise their role as models. Topics covered through encouragement and modelling were primarily focused on physical activity and diet, two lifestyle behaviours that are associated with school health.
Strengths	Diversity of the sample
Weaknesses	Study is not generalizable.

8. Title	**A Pilot School-Based Healthy Eating and Physical Activity Intervention Improves Diet, Food Knowledge, and Self-Efficacy for Native Canadian Children**
Authors, publication date, DOI #/PMID, ISBN	Saksvig, Gittelsohn, Harris, Hanley, Valente, & Zinman, 2005 PMID: 16177202
CSH Pillar(s)	Teaching and Learning, Healthy School Policy
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Pre-test/Post-test of 4 measurements (anthropometry, 24-h dietary recall, and 2 questionnaires)
Methodology	Quantitative Methods
Location(s)	Sandy Lake, ON 
School Level	Elementary
Purpose of Evaluation	To describe the effect of a school-based intervention and the extent to which it would increase students' knowledge, skills, and dietary self-efficacy and positively change behaviours related to diet and physical activity.
Sample Population	Students
Research Instrument(s)	Anthropometric status (height, weight, body fat percentage), 24-h dietary intake recall pre- and post-intervention, health knowledge, and behaviour questionnaire (developed from the CATCH Health Behaviours Questionnaire and the Kahnawake Schools Diabetes Prevention Program classroom questionnaire), parent questionnaire
Method	122 of 138 eligible students (88%) completed all 4 measurements at baseline and follow-up (anthropometry, dietary recall, in-class questionnaire, individual questionnaire). Pretest/Post-test, single sample design conducted during the 1998-1999 school year in Grades 3, 4, and 5 in a school in Sandy Lake, Ontario.
Key Findings	The Sandy Lake First Nations Diabetes Promotion Program was significantly associated with increased knowledge, dietary self-efficacy, and dietary improvements. Study did not find any reduction in obesity in the children. This study provides evidence that culturally adapted materials can be an effective means of reaching North American Indian children and modifying risk factors related to diabetes and obesity.
Strengths	Intervention was implemented in a First Nations community, and results are likely generalizable to other remote First Nations communities. The use of local radio stations in First Nations communities, as a primary mode of communication within and among communities throughout Canada, is an innovative approach. The positive results of this study are encouraging given the limitations (discussed in the 'weaknesses' section).
Weaknesses	Researchers cited a lack of a control group, which may have led to testing effects. Use of a single 24-h dietary recall (pre- and post-) to assess change in diet among study children due to time, resource limitations, and respondent burden concerns, instead of conducting multiple dietary recalls. A limitation of the school program itself was the lack of a strong physical activity component in the intervention.

9. Title	**The Relationship between School Climate and Math and Reading Achievement**
Authors, publication date, DOI #/PMID, ISBN	Sherblom, Marshall, & Sherblom, 2006 1543-1223
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Standardized tests of reading and mathematics
Methodology	Quantitative methods study
Location(s)	St. Louis, Missouri, USA
School Level	Elementary schools
Purpose of Evaluation	The present study examines the relationship of school climate to student achievement by exploring student, teacher, staff, and parental perceptions of social dynamics concerning inclusion, concern, respect, collaboration, and belonging, and articulating their relationship to student proficiency in math and reading achievement. This study reports the relationship between aspects of school climate as reported on student, teacher/staff, and parent surveys and third and fourth graders' scores on the state standardized tests of reading and mathematics.
Sample Population	Students
Research Instrument(s)	Caring School Community Survey (CSC); Staff Survey Missouri Assessment Program (MAP)
Method	-Baseline data collected from an experimental 4-year federally-funded community-based project designed to support elementary schools: CSC. This is a character education (i.e., teaching core values that enable students to cooperate and co-exist in harmony) intervention. -The relationship between elements measured by these surveys and the math and reading achievement scores of third and fourth grade students was studied. 40 schools were randomly selected for participation in the project from a stratified sample -Data-producing sample consisted of 5,750 students in third and fourth grades; 1,567 teachers and staff who completed the teacher-staff survey; 1,543 teachers and staff who completed the CSC implementation survey; and 1,955 parents who completed the parent survey.
Key Findings	-School climate, as represented in students' perceptions of the classroom community, their sense of well-being, and their concern for others, were strongly related to mathematics and reading proficiency. -The development of a school-wide caring community that improves the relational and social interaction and relationships within a school, and that enriches a school's climate through changes in the communication and in the relationships among school staff, students, and families, can have a direct effect on student achievement scores.
Strengths	-Provides strong evidence that, as a group, perceptions of school climate as embodied in these character education based measures are strongly correlated with student achievement in reading and math.
Weaknesses	-The present study cannot demonstrate with any specificity how individual aspects of school climate are related to achievement scores.

10. Title	**Effect of Anxiety Reduction on Children's School Performance and Social Adjustment**
Authors, publication date, DOI #/PMID, ISBN	Wood, 2006 10.1037/0012-1649.42.2.345
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive, Affective
Measure(s) of Student Achievement	Standardized scales: CBCL and CAIS
Methodology	Quantitative methods study
Location(s)	Major Metropolitan area of the western US
School Level	Elementary and middle schools
Purpose of Evaluation	To test the effect of reduction in anxiety over time on improvements in school performance and social adjustment in the context of participating in a cognitive-behavioural intervention.
Sample Population	Children (6-13 years old)
Research Instrument(s)	Anxiety Disorders Interview Schedule for DSM-IV (American Psychiatric Association, 1994): Child and Parent Versions (ADIS/C/P); Silverman & Albano, 1996) Multidimensional Anxiety Scale for Children (MASC; March, 1998) Child Behaviour Checklist (CBCL; Achebach, 1991) Child Anxiety Impact Scale (CAIS; Langley et al., 2004)
Method	-40 children with high anxiety living in a major metropolitan area of the western US -children were referred to the study by multiple community sources, including local school psychologists, principals, and a medical center -randomized, controlled trial of a cognitive-behavioural intervention -all children met the DSM-IV (American Psychiatric Association, 1994) criteria for at least one anxiety disorder -38 children (95%) completed the intervention and were assessed at post intervention -two variations of a cognitive-behavioural therapy (CBT) intervention program were implemented; children were randomly assigned to either family-focused CBT or child-focused CBT.
Key Findings	-primary implication of this study is that children's school performance and social functioning may be enhanced as a result of a reduction in children's anxiety over the course of time
Strengths	-longitudinal study -independent raters of children's anxiety symptoms -multiple methods of assessment of the dependent variables
Weaknesses	-small sample size, and specific characteristics limit generalizability -teacher reports of school performance would have been useful

APPENDIX D: SCHOLARLY LITERATURE IN THE BEHAVIOURAL DOMAIN

1. Title	**Adolescent behavioral, affective, and cognitive engagement in school: Relationship to Dropout**
Authors, publication date, DOI #/PMID, ISBN	Archambault, Janosz, Morizot, & Pagani, 2009 10.1111/j.1746-1561.2009.00428.x.
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments, Healthy School Policy
Learning Domain(s)	Cognitive, Behavioural, Affective
Measure(s) of Student Achievement	Social learning environment, official school records, teacher-student relationships, peer relationships, parental involvement, dropout rates
Methodology	Quantitative methods study
Location(s)	Quebec 
School Level	Secondary schools
Purpose of Evaluation	To evaluate three distinct dimensions of student engagement in high school and examine the relationships between the nature and course of such experiences and later dropout.
Sample Population	Students
Research Instrument(s)	Questionnaires
Method	- questionnaires to **n=13,330** students (44.7% boys) from 69 Quebec secondary schools - during 3 consecutive high school years, students reported their behavioural, emotional, and cognitive engagement in school - information on later dropout status was obtained through official records
Key Findings	- while many adolescents remained highly engaged in high school, 1/3 reported changes, especially decreases in rule compliance, interest in school, and willingness to learn - students reporting low engagement or important decrements in behavioural investment from the beginning of high school presented higher risks of later dropout - school-based interventions should address the multiple facets of high school experiences to help adolescents successfully complete their basic schooling - creating a positive social-emotional learning environment promises better adolescent achievement and, in turn, will contribute to a healthier lifestyle
Strengths	- a longitudinal study that allowed researchers to assess changes in behaviours, emotions, and cognitive engagement - students' self-reported data were combined with official school records
Weaknesses	- quantitative findings may have been complemented by qualitative findings - self-reported data may have resulted in underreporting

2. Title	**Self-beliefs and behavioural development as related to academic achievement in Canadian Aboriginal children**
Authors, publication date, DOI #/PMID, ISBN	Baydala, Rasmussen, Birch, Sherman, Charchun, Kennedy, & Bisanz, 2009 10.1177/0829573509332243
CSH Pillar(s)	Teaching and Learning,
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	Leadership skills, friendships, student belongingness, achievement tests, teacher-parent-community collaboration
Methodology	Quantitative methods study
Location(s)	Alberta 
School Level	Elementary and junior high schools
Purpose of Evaluation	To examine the extent to which self-beliefs and behavioural development relate to academic achievement in a sample of Canadian Aboriginal children who attended a school designed to provide an education that is compatible with Aboriginal culture and principles of learning.
Sample Population	Students, teachers, and primary caregivers
Research Instrument(s)	- surveys: Self-Perception Profile for Children (SPPC), Wechsler Individual Achievement Test II (WIAT II), Behaviour Assessment System for Children (BASC)
Method	- this study is part of a larger longitudinal study of academic achievement and health in children who attended Mother Earth's Children's Charter School (MECCS; the first Aboriginal charter school in Canada established in 2003 in response to the need for culturally compatible and positive educational experience) - data were collected in 2003-2004 school year from students in Grades 1 through 8 (**n=69**), their primary caregivers, and teachers; 58 students were in Grades 1-6 (elementary) and 11 students were in Grades 7 and 8 (junior high); 36 students were female and 33 were male - 58 students self-identified as First Nations Treaty, 10 as Métis, and one as First Nations Non-Treaty; while all students started school speaking English, they all reported speaking a specific Aboriginal language; instruction at MECCS is also offered in Cree and Stoney - questions were administered individually or in small groups; questions about job competence, romance, and close friendships were added to the SPCC survey for students in Grades 7 and 8 - research team held meetings and sent home letters periodically to update caregivers, community members, and staff about the progress of the study
Key Findings	- teacher BASC ratings were highly related to measures of academic achievement - students who showed higher levels of adaptive behaviour (e.g., leadership) tended to have higher achievement test scores - significant positive correlations found between SPPC Close Friendships subtest and academic achievement; incorporating students' language and cultural beliefs at school may increase their sense of belonging, increase the number of friendships they have, and ultimately support academic achievement
Strengths	- comparison data using multiple instruments with multiple participants - study is longitudinal; change can be more accurately measured
Weaknesses	- the authors noted that their results need to be interpreted with caution because of the small sample size, and noted the need for similar studies with larger sample sizes specifically designed for Aboriginal populations

3. Title	**Promoting effective parenting practices and preventing child behaviour problems in school among ethnically diverse families from underserved, urban communities**
Authors, publication date, DOI #/PMID, ISBN	Brotman, Calzada, Huang, Kingston, Dawson-McClure, Kamboukos, Rosenfelt, Schwab, & Petkova, 2011 10.1111/j.1467-8624.2010.01554.x
CSH Pillar(s)	Partnerships and Services
Learning Domain(s)	Behavioural
Measure(s) of Student Achievement	Parental involvement in education, child school readiness, school-family-community collaboration
Methodology	Mixed methods study
Location(s)	New York, USA
School Level	Elementary schools
Purpose of Evaluation	To evaluate the effectiveness of ParentCorps program on 4-year-old children enrolled in Pre-Kindergarten in schools in a large urban school district. ParentCorps is a family intervention designed specifically to promote effective parenting practices and prevent behaviour problems in schools that are associated with low school achievement among ethnically diverse children from disadvantaged, urban communities. ParentCorps is a joint program between schools and health professionals; the program includes a series of 13 group sessions for parents and children held at the school during early evening hours and facilitated by teachers and mental health professionals.
Sample Population	Students, teachers, parents
Research Instrument(s)	Questionnaires, in-home observations, semi-structured interviews, content and process checklists, Developmental Indicators for the Assessment of Learning-3 (to evaluate school readiness skills), parent engagement/satisfaction surveys
Method	- 2-year randomized controlled trial; 2 consecutive cohorts of Pre-K students were recruited - **n=171** four-year-old children enrolled in Pre-Kindergarten across eight public elementary schools (n=4 control, n=4 intervention) in a large New York City school district, representing an ethnically diverse population participated in the study - parent interviews were conducted in their homes (for the most part); parents and their children were videotaped during a semi-structured play interaction in their homes at pre-intervention in the fall term and at post-intervention at the end of the spring term; during the same time periods, teachers completed questionnaires about children's behaviour and parental involvement in school and children completed study-administered tests about school readiness - parent engagement/satisfaction surveys were administered at the end of each of the 13 two-hour sessions - assessment procedures for parents, teachers, and children were identical across control and intervention schools
Key Findings	- number of sessions attended was significantly related to increased Effective Parenting Practices (parent report and test) with a monotone linear increase of the effect with each additional session attended - family intervention delivered in the preschool period results in important benefits for children at risk for behaviour problems and academic underachievement based on residence in disadvantaged communities
Strengths	- teachers and assistants in all schools received training to co-facilitate the family intervention, including learning effective practices for managing children's behaviour - baseline and follow-up assessments completed
Weaknesses	- relatively small sample size; findings not generalizable - by training teachers in both intervention and control conditions, it is potentially more difficult to detect differences between the conditions attributable to the family intervention

4. Title	**Strengths-based programming for First Nations youth in schools: Building engagement through healthy relationships and leadership skills**
Authors, publication date, DOI #/PMID, ISBN	Crooks, Chiodo, Thomas, & Hughes, 2009 10.1007/s11469-009-9242-0
CSH Pillar(s)	Social and Physical Environments, Partnerships and Services
Learning Domain(s)	Cognitive, Behavioural, Affective
Measure(s) of Student Achievement	Youth engagement Note: The Centre for Excellence on Youth Engagement (2007) has defined youth engagement as the "meaningful participation and sustained involvement of a young person in an activity, with a focus outside of him or herself. Youth engagement is a nonspecific protective factor that has been connected to a wide range of positive outcomes including lower rates of school failure and drop-out and lower rates of anti-social and criminal behaviors. Other researchers have found youth engagement to be associated with decreased alcohol use, decreased marijuana and hard drug use, lower rates of school failure, and lower rates of sexual activity and pregnancy. Three types of youth engagement indicators are identified as: behavioural, cognitive, and attitudinal (the last of which we are terming as affective).
Methodology	Mixed methods study
Location(s)	Ontario
School Level	Elementary and secondary schools
Purpose of Evaluation	To evaluate initiatives under Uniting Our Nations: Relationship-based program for First Nations youth to make a case for strengths-based programming with First Nations youth in schools, with a focus on increasing youth engagement. The primary objective of this program is to promote healthier relationships and develop youth leadership skills in order to increase youth engagement and school connectedness. This program includes a secondary school peer mentoring program, a First Nations Cultural Leadership Course, and Grade 8 Transitions Conferences.
Sample Population	Students, teachers, in-school First Nations counselors (in secondary schools), school Administrators, community organizations
Research Instrument(s)	Questionnaires, official school records, conference surveys
Method	- over a 4-year time period, a multidisciplinary team of researchers, educators, program developers, and community leaders worked together to develop the program - data collection was multi-faceted (including surveys, standardized questionnaires, interviews, focus groups, and official school data) and also multi-informant (from youth, educators, First Nations Counsellors and administrators)
Key Findings	- students in the First Nations Cultural Leadership Course showed higher academic performance and lower absenteeism in this class compared to their other courses - elementary students attending the transitions conferences indicated lower levels of anxiety and a higher degree of optimism and confidence about their transition to secondary school - youth in the mentoring program express a high degree of satisfaction in the program
Strengths	- researchers were able to engage more parents and community members more in this school based program as funders and community mentors - baseline and follow-up assessments completed
Weaknesses	- youth might have felt pressure to provide positive feedback to the program developers - the data presented would be stronger with additional quantitative indicators; most notably, no quantitative data were collected relating to cognitive engagement

5. Title	**Positive youth development requires comprehensive health promotion**
Authors, publication date, DOI #/PMID, ISBN	Flay, 2002 http://people.oregonstate.edu/~flayb/MY%20PUBLICATIONS/Positive%20Action/Flay%2002%20Positive%20Youth%20Development.pdf
CSH Pillar(s)	Teaching and Learning, Social and Physical environments, Partnerships and Services
Learning Domain(s)	Behavioural
Measure(s) of Student Achievement	Parental involvement in school, school's organizational structure, teachers' attitudes and beliefs, school-parent-community collaboration, students' social skills
Methodology	Review synthesis
Location(s)	United States of America
School Level	Elementary and secondary schools
Purpose of Evaluation	To explore relationships among problem and positive youth behaviours, commonalities among their predictors, and implications for prevention.
Sample Population	Students
Research Instrument(s)	Maine School Health Profiles Survey, Maine Youth Drug and Alcohol Use Survey/Youth Tobacco Survey
Method	- review of etiology and prevention literatures - reviewed existing theories and showed how these theories could be arranged into a two-dimensional matrix; the first dimension represents 3 types of influence: cultural/attitudinal factors, interpersonal factors, intrapersonal factors; the second dimension represents different levels of influence: ultimate factors (out of students' control), distal factors, proximal factors - matrix was used to develop the theory of triadic influence (TTI); TTI asserts that the various causes of problem behaviour fall into 3 streams of influence: sociocultural factors, interpersonal factors, and intrapersonal factors
Key Findings	- all behaviours have the same causes, especially at the distal/ultimate levels - social influences (e.g., families, schools, peers, neighbourhoods) are particularly important during adolescence - all behaviours, not just problem behaviours, are related to each other - comprehensive, long-term, school-wide interventions that involve families and communities, but are not too difficult to implement, can successfully reduce multiple problem/risky, unhealthy, and antisocial behaviours, and increase multiple positive, healthy and pro-social behaviours, improve mental health and self-concept and enhance academic performance
Strengths	- utilized meta-analytic reviews and systematic review
Weaknesses	N/A

6. Title	**School lunch and learning behaviour in primary schools: An intervention study**
Authors, publication date, DOI #/PMID, ISBN	Golley, Baines, Bassett, Wood, Pearce, & Nelson, 2010 10.1038/ejcn.2010.150
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments
Learning Domain(s)	Behavioural
Measure(s) of Student Achievement	On-task and off-task behaviour
Methodology	Quantitative methods study
Location(s)	England
School Level	Primary schools
Purpose of Evaluation	To evaluate the impact of a school food and dining room intervention on students' learning-related classroom behaviour in the post-lunch period. Modifications included food and dining room checklist tool, adjusting menus to comply with food-based standards, promoting menus to students and parents, and staggering lunchtimes and modifying queuing system.
Sample Population	Students
Research Instrument(s)	- food and dining room check-list tool was used to develop practical intervention activities - observational protocol (performed by trained researchers)
Method	- a controlled intervention trial involving six primary schools matched in triplets and randomly assigned to a 12-week intervention (promotion of healthier school food at lunchtime and changes in the school dining environment) or 12-week wait-listed control group - learning-related behaviours measured in a random sample of **n=146** pupils in years 3-5
Key Findings	- students attending intervention schools were 3.4 times (95% confidence interval [95% CI] 1.56-7.35) more likely to be 'on-task' than controls in the post-lunch period - school food and dining room intervention can have a positive impact on students' alertness; however, raised alertness must be channeled and supervised to prevent off-task behaviour
Strengths	- there was a baseline and follow-up assessment - fieldworkers/observers underwent training (i.e., intensive training program, followed by weekly support sessions during data collection and refresher sessions before follow-up)
Weaknesses	- researchers unable to distinguish between the effects of the dietary and dining room modifications - a longer study would be required to determine the sustainability of behavioural changes

7. Title	**Teachers' beliefs about inappropriate behaviour: Challenging attitudes?**
Authors, publication date, DOI #/PMID, ISBN	Grieve, 2009 10.1111/j.1471-3802.2009.01130.x
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments
Learning Domain(s)	Behavioural
Measure(s) of Student Achievement	Teachers' attitudes and beliefs
Methodology	Quantitative methods study
Location(s)	Scotland
School Level	Primary schools
Purpose of Evaluation	To explore the beliefs expressed by teachers in one local authority regarding the inclusion of students with inappropriate behaviour in mainstream primary schools.
Sample Population	Teachers in primary schools and teachers (secondary and primary) belonging to a nominal group at a postsecondary institution within the local authority as the primary schools.
Research Instrument(s)	Two sets of questionnaires: - questionnaires distributed to teachers in primary schools focused on teachers' understanding of inclusion and their understanding of inappropriate behaviour and students who display inappropriate behaviour - questionnaires distributed to teachers in the nominal group at the postsecondary institution focused on constructing a conceptual framework for assessing teacher effectiveness in regards to teaching students who display inappropriate behaviour
Method	- questionnaires were distributed to all teachers (n=511) at 53 primary schools in the local Authority, 36 primary schools responded with **n=201** responses from teachers - two-page questionnaires rated using a 5-point Likert scale was distributed to **n=21** teachers in the nominal group; they all responded - all questionnaires were anonymous and were returned to researchers by mail
Key Findings	- there appeared to be discrepancy between what teachers in the various schools considered to be inappropriate behaviour - one-third of the teachers felt that the inclusion of students with social, emotional, and behavioural difficulties was detrimental to the education of others in all circumstances - all teachers agreed that inclusion of students with social, emotional, and behavioural difficulties caused staff additional stress - a number of teachers used the term 'normal children' when discussing inclusion, implying that those with social, emotional, and behavioural difficulties were in some way 'abnormal' - no explicit comments made about adapting or changing teaching methods or delivery of the curriculum to accommodate the needs of students with behavioural difficulties
Strengths	- the use of anonymous questionnaires provided teachers with an opportunity to disclose their true beliefs without consequences about inclusion, behaviour, and students
Weaknesses	- interviews with teachers might have enriched questionnaire data

8. Title	**The relationship of school-wide Positive Behaviour Support [PBS] to academic achievement in an urban middle school**
Authors, publication date, DOI #/PMID, ISBN	Lassen, Steele, & Sailor, 2006 10.1002/pits.20177
CSH Pillar(s)	Teaching and Learning, Healthy School Policy
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	Office disciplinary referrals (ODRs), positive referral tickets, suspensions
Methodology	Mixed methods study
Location(s)	Midwestern, USA
School Level	Elementary school (urban, inner-city school)
Purpose of Evaluation	To evaluate the outcomes of a school-wide PBS program over a 3-year period in an elementary school by examining the relationship between student problem behaviour and academic achievement and investigating the relationship between PBS adherence and a broader range of indicators of overall treatment outcomes. PBS is an approach to addressing challenging behaviour of students in schools.
Sample Population	Students
Research Instrument(s)	School-wide Evaluation Tool (SET), official school disciplinary referral and suspension records, school incident-reports, Kansas State Assessment for reading and math
Method	- case study: one school used as unit of analysis in low-income inner-city area - at the beginning of the first year of the study, researchers visited classrooms, spoke with teachers, and school administrators to gain an understanding of the organization of the school and learn about specific school culture - detailed descriptive statistics were generated for both ODRs and suspensions for each year of study; a series of ANOVAs were conducted to determine if differences in the number of ODRs and suspensions for each year of the study were statistically significant - four different regression analyses were conducted to examine the relationship between ODRs and suspension and standardized math and reading test scores
Key Findings	- approximately 80% of the entire school population were economically disadvantaged based on the proportion of students eligible for free or reduced-price lunch (statewide rate: 32%) - number of long-term suspensions significantly decreased each year from baseline to ending - means plots for standardized reading scores indicated that test scores decreased from baseline to Year 1 and increased each year from Year 1 to Year 3 - the improvement in math scores for baseline to Year 2 was significant as was the improvement from baseline to Year 3 - students with fewer ODRs scored higher on standardized reading and math tests -
Strengths	- longitudinal study allowed researchers to examine changes in test scores - school disciplinary policies were examined - baseline and follow-up assessments completed using SET - observations of specific school culture
Weaknesses	- incident-reports reflect multiple influences within schools and changes in these data could reflect changes in school-wide policies around reporting of student behaviour, rather than changes in student behaviour per se

9. Title	**Effects of a free school breakfast programme on children's attendance, academic achievement and short-term hunger: Results from a stepped-wedge, cluster randomized controlled trial**
Authors, publication date, DOI #/PMID, ISBN	Ni Mhurchu, Gorton, Turley, Jiang, Michie, Maddison, & Hattie, 2012 10.1136/jech-2012-201540
CSH Pillar(s)	Social and Physical Environments, Partnerships and Services
Learning Domain(s)	Cognitive, Behavioural, Affective
Measure(s) of Student Achievement	School attendance, sense of belonging, literacy and numeracy tests
Methodology	Mixed methods study
Location(s)	North Island, New Zealand
School Level	Primary schools
Purpose of Evaluation	To evaluate the effects of a school breakfast programme in low decile schools (located in low socioeconomic areas) on students' attendance, school achievement, psychological function, and nutrition (Final report of evaluation is pending). This program provided children with a daily free meal.
Sample Population	Students, school staff, parents, breakfast staff
Research Instrument(s)	- questionnaires, government survey data, interview guides
Method	- participating schools (clusters) crossed over from control to intervention phase at different time points throughout the year - 16 primary schools (four schools per sequence) participated - **n=400** students participated (approx. 25 students per school) - record of school attendance each term - standardized literacy and numeracy tests conducted by the government in terms 1 & 4 - students' self-report surveys - PISA (for sense of belonging), Dietary Habits surveys, and smaller surveys - school staff, parents completed surveys; breakfast providers participated in semi-structured interviews
Key Findings	- precise understanding of the impact of the programme can only be accomplished by considering the perspectives of all stakeholders - no consistent significant effect of intervention on academic achievement, attendance, sense of belonging, self-reported grades - the number of children who ate breakfast did not change; however, the number of children who did not eat breakfast at home increased, while approximately the same number began eating breakfast at school - intervention had significant positive effects on children's short-term hunger ratings
Strengths	- implementation and evaluation were simultaneous, providing a more realistic viewpoint of the constantly evolving nature of such programs - attendance: primary outcome measured - achievement: secondary outcome measured - voices of multiple stakeholders (students, school staff, parents, food providers) - one-year trial - baseline assessments were completed
Weaknesses	- surveys were distributed inconsistently to participating schools during the year - Note: The final report of this study is still unavailable/unpublished

10. Title	**A randomized controlled trial of the effect of school food and dining room modifications on classroom behaviour in secondary school children**
Authors, publication date, DOI #/PMID, ISBN	Storey, Pearce, Ashfield-Watt, Wood, Baines, & Nelson, 2011 10.1038/ejcn.2010.227
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments
Learning Domain(s)	Behavioural
Measure(s) of Student Achievement	On-task and off-task behaviour
Methodology	Quantitative methods study
Location(s)	England
School Level	Secondary schools
Purpose of Evaluation	To evaluate the impact of school food and dining modifications on students' learning-related behaviours in the post-lunch period. Modifications included food and dining room checklist tool, adjusting menus to comply with food-based standards, promoting menus to students and parents, and staggering lunchtimes and modifying queuing system.
Sample Population	Students
Research Instrument(s)	- food and dining room check-list tool was used to develop practical intervention activities - observational protocol (performed by trained researchers)
Method	- randomized trials in 2008 in 12 co-educational secondary schools in England (Manchester, Sheffield, Leicester, and Essex) occurred over a 15-week time period - **n=156** students (58 control and 98 intervention) - learning-related behaviours were systematically observed during post-lunch classes at all schools - observers were well trained; they used a validated protocol to determine whether students were 'on task' (concentrating and alert) or 'off task' (disruptive or disengaged)
Key Findings	- changes in classroom behaviour observed after modifications to the eating and dining environments support moderate associations between academic performance and dietary intakes observed in cross-sectional studies - at follow-up, intervention students were 18% more likely to be on-task and 14% less likely to be off-task compared with control group - modifying food provision and dining environments can improve secondary school students' learning-related behaviours
Strengths	- there was a baseline and follow-up assessment - fieldworkers/observers from the National Centre for Social Research underwent training (i.e., 4-day intensive training program, followed by weekly support sessions throughout the baseline data collection period and refresher sessions immediately before follow-up) - research instruments were replicated to a large extent from previous study in primary schools (see Golley et al., 2010)
Weaknesses	- timetabling challenges made it impossible to stratify observations on individuals according to subject type - researchers unable to distinguish between the effects of the dietary and dining room modifications - a longer study would be required to determine the sustainability of behavioural changes and the impact on educational attainment, absenteeism, truancy, etc.

APPENDIX E: SCHOLARLY LITERATURE IN THE AFFECTIVE DOMAIN

1. Title	**Effects of an elementary school intervention on students' "connectedness" to school and social adjustment during middle school**
Authors, publication date, DOI #/PMID, ISBN	Battistich, Schaps, & Wilson, 2004 0278-095X/04/0300-0243/0
CSH Pillar(s)	Cognitive, Behavioural, Affective
Learning Domain(s)	Social and Physical Environments, Partnerships and Services
Measure(s) of Student Achievement	School-related attitudes, academic achievement, personal and social attitudes, positive and negative behaviours, friends' positive and negative behaviours, teacher ratings of behaviour
Methodology	Quantitative methods study
Location(s)	USA
School Level	Elementary schools ("middle school")
Purpose of Evaluation	To examine the effects at follow-up during middle school of a comprehensive elementary-school intervention program, the Child Development Project (CDP), designed to reduce risk and promote resilience among youth.
Sample Population	Students from six (of 12) CDP program elementary schools and demographic-matched comparison schools
Research Instrument(s)	Student questionnaires, teacher ratings of student behaviours, student records
Method	- cohort-sequential design follow up to elementary school study, with a middle-school sample (n=700 former CDP participants and n=546 former comparison students, 49% males) - questionnaires administered to middle school children - students randomly assigned to be rated by two or three of their middle school teachers on 10 behavioural descriptions - school records provided measures of students' grade-point average in core academic subjects and scores on district-administered achievement tests
Key Findings	- 40% of the outcome variables examined during middle school showed differences favouring program students - among the "high implementation" group, 65% of outcome variables showed differences favouring program students - program students who experienced high implementation during elementary school also had higher academic performance, and associated with peers who were more prosocial and less antisocial
Strengths	- evaluation of a real-world intervention - breadth of outcomes assessed
Weaknesses	- attrition rates (due to delay in funding, follow-up study began after many students graduated from middle school) - ignored longitudinal nature of data

2. Title	**The relationship of schools to emotional health and bullying**
Authors, publication date, DOI #/PMID, ISBN	Freeman, Samdal, Klinger, Dur, Griebler, Currie, & Rasmussen, 2009 10.1007/s00038-009-5421-9
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive, Behavioural, Affective
Measure(s) of Student Achievement	Emotional health, bullying
Methodology	Quantitative methods study
Location(s)	26 European countries/regions, Canada, the United States, and Israel
School Level	Elementary and secondary schools (11, 13, and 15-year olds)
Purpose of Evaluation	To examine the extent to which school climate and school pressure could predict the adolescents' emotional health and bullying, and to see if the relationships were consistent across countries.
Sample Population	Students
Research Instrument(s)	Large-scale cross-national survey (Health Behaviour in School-aged Children [HBSC])
Method	- questionnaire - single time point, cross-sectional design - Nationally/regionally representative samples of approximately 1,500 students at each age group (11, 13, and 15) were drawn - participants selected using cluster sampling with school or school class as the sampling unit
Key Findings	- students in the cluster having the most positive relationships to school outcomes, including academic achievement, truancy, teacher and peer support, also had the most positive emotional health and the lowest incidence of bullying. - those in the poorest cluster in terms of school had the poorest outcomes for emotional health and bullying
Strengths	- large, internationally representative sample - multiple age groups - examination of cross-national patterns
Weaknesses	- generalizability to specific contexts - low internal reliability in some subscales - correlational design, so not possible to examine causality.

3. Title	**The effects of family, school, and classroom ecologies on changes in children's social competence and emotional and behavioural problems in first grade**
Authors, publication date, DOI #/PMID, ISBN	Hoglund & Leadbeater, 2004 10.1037/0012-1649.40.4.533
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Social competence (e.g., interpersonal skills, leadership abilities), emotional problems (e.g., anxious, withdrawn), and behavioural problems (e.g., disruptiveness, aggressiveness)
Methodology	Quantitative methods study
Location(s)	British Columbia 
School Level	Elementary schools
Purpose of Evaluation	To evaluate the independent and interactive contribution of classroom, family, and school factors to changes in children's in-school behaviours as rated by their teachers during first grade.
Sample Population	Students in Grade 1, teachers
Research Instrument(s)	- Grade 1 students' self-report questionnaires assessing peer prosocial behaviours and victimization, as well as interpersonal negotiation strategies - Teacher ratings of students assessing social competence, and emotional and behavioural problems
Method	- longitudinal design over the course of the school year with measurements at two time points (fall [beginning of Grade 1], spring [end of Grade 1]) - administered questionnaires to **n=432** Grade 1 students (49% girls) and teachers, **n=44**, from 17 schools in a medium-sized Canadian city in British Columbia
Key Findings	- higher classroom concentrations of prosocial behaviours predicted increases in school competence, and greater school disadvantage predicted increases in behavioural problems - multiple household moves and low levels of mothers' education predicted increases in emotional problems for children in classrooms with few prosocial behaviours - greater school disadvantage and predicted increases in emotional problems for children in classrooms with low prosocial behaviours and high victimization
Strengths	- a longitudinal study that allowed researchers to assess changes in behavioural problems, emotional problems, and social competence - students' self-reported data were combined with teacher-reported data
Weaknesses	- longitudinal follow-up research needed to clarify whether or not school, family, and classroom ecology and their interactive effects continue to influence changes in children's development - study sample was limited to a medium-sized city in British Columbia

4. Title	**Relationships among adolescent subjective wellbeing, health behaviour, and school satisfaction**
Authors, publication date, DOI #/PMID, ISBN	Katja, Päivi, Marja-Terttu, & Pekka, 2002 12212409
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Subjective wellbeing
Methodology	Quantitative methods study
Location(s)	Finland
School Level	Secondary schools
Purpose of Evaluation	To examine the relationship among subjective wellbeing, school satisfaction, and health behaviour of Finnish secondary school students.
Sample Population	Students
Research Instrument(s)	Questionnaires
Method	- questionnaires administered to **n=245** Finnish secondary school students (51% female) in 7^{th} and 9^{th} grades from 13 secondary schools - response rate was 48% and returned valid questionnaires that were removed due to lack of parental consent did not differ from study data in the background variables of gender, class, school, and family type
Key Findings	- school satisfaction, body satisfaction, and self-rated good health explained 50% of the variance in global satisfaction among female responders - additional to those observed among females, low-intensity drinking explained 31% of the variance in global health satisfaction for males - significant associations for females for global ill-being included body dissatisfaction, high-intensity drinking, and self-rated moderate health (34% of the variance), and for males regular drinking and body dissatisfaction explained 14% of the variance.
Strengths	- examination of gender effects
Weaknesses	- correlational design, so not possible to examine causality - reliance on adolescents' self-reported data - relatively high non-response rate

5. Title	**Supporting adolescent emotional health in schools: A mixed methods study of student and staff views in England**
Authors, publication date, DOI #/PMID, ISBN	Kidger, Donovan, Biddle, Campbell, & Gunnell, 2009 10.1186/1471-2458-9-403
CSH Pillar(s)	Teaching and Learning, Partnerships and Services, Social and Physical Environment, Healthy School Policy
Learning Domain(s)	Affective
Measure(s) of Student Achievement	Support for emotional health and wellbeing (i.e., improvements in emotional health or reduction in emotional difficulty)
Methodology	Mixed methods study
Location(s)	England and Wales
School Level	Secondary schools
Purpose of Evaluation	To quantify current level of emotional health provision in secondary schools in England, and to understand what staff and student perceptions are of how schools can improve their support of adolescent emotional health both within and outside of the curriculum.
Sample Population	Students, staff of high schools
Research Instrument(s)	- questionnaires - focus groups with students - individual interviews with staff members
Method	- Quantitative: random sample **n=296** secondary school students from England and Wales completed a survey on current emotional health provision - Qualitative: (a) purposeful sampling for focus group (27 groups, **n=154** students) from survey respondents to ensure range of emotional health activity, free school meal eligibility, and location; (b) staff interviews (12 interviews, **n=15**)
Key Findings	- schools did or could intervene in the following areas: emotional health in the curriculum; support for those in distress; physical and psychosocial environment - little time was spent teaching about emotional health in the curriculum, and staff and students wanted more - exploring emotions in multiple subject areas was valued - type and quality of support for students experiencing emotional distress in schools varied - need for emphasizing the whole school environment to address bullying, teacher-student relationships, and activities that increased mental health
Strengths	- large study exploring staff and student views of emotional health and well being in schools - qualitative findings provided more in-depth insight into quantitative measure
Weaknesses	- focus on students' and staff; thus may exclude some perspectives about how schools address emotional health and wellbeing - teachers selected half the participants for the focus groups, possibly creating a selection bias - possible group conformity in the focus groups

6. Title	**The effect of the school environment on the emotional health of adolescents: A systematic review**
Authors, publication date, DOI #/PMID, ISBN	Kidger, Araya, Donovan, & Gunnell, 2012 10.1542/peds.2011-2248
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments, Partnerships and Services
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Emotional health (positive or negative) including: depression symptoms, emotional literacy, mental health difficulties, internalizing behaviour, self-efficacy in school, satisfaction with self, likelihood of future success, suicide attempts and/or ideation, anxiety, stress, motivation, strengths and difficulties for general functioning; mood and feelings.
Methodology	Review synthesis: Cohort studies or controlled trials
Location(s)	Varied by study in review
School Level	Inclusion criteria for studies looking at students aged between 11 and 18
Purpose of Evaluation	Summarize the empirical evidence for the effects of school environment on the emotional health of adolescents
Sample Population	Students
Research Instrument(s)	Systematic review
Method	- criteria for inclusion were (1) cohort or controlled trial designs, (2) participants aged 11 to 18 years, (3) emotional health outcomes, and (4) school environment exposure or intervention
Key Findings	- 2 nonrandomized trials found evidence that supportive school environments can improve student emotional health, 3 randomized controlled trials did not - 6 cohort papers examined school-level factors but found no effect - some evidence that individual perceptions of school connectedness and teacher support predict future emotional health - school-level effects were smaller than individual-level effects
Strengths	- thorough coverage of literature - strict inclusion/exclusion criteria - grouping of results by intervention versus cohort studies
Weaknesses	- methodological shortcomings across the reviewed studies were common - lack of evidence surrounding students' connectedness to schools and their perceptions regarding teacher support with respect to their emotional health

7. Title	**Social and emotional training in Swedish schools for the promotion of mental health: An effectiveness study of 5 years of intervention**
Authors, publication date, DOI #/PMID, ISBN	Kimber, Sandell, & Bremberg, 2008 10.1093/her/cyn040
CSH Pillar(s)	Teaching and Learning
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Internalizing problems, externalizing problems, mastery (reflecting self-efficacy or hopelessness), self-image and self-esteem, contentment in school, bullying, social skills (including cooperation, assertion, empathy, self-control)
Methodology	Quantitative methods study
Location(s)	Stockholm, Sweden
School Level	Elementary and secondary schools
Purpose of Evaluation	To determine the effectiveness of school personnel-administered Social Emotional Training (SET) to a set of outcomes associated with mental health.
Sample Population	Students
Research Instrument(s)	Questionnaires
Method	- longitudinal design - school-wide SET intervention (intervention covers self-awareness, managing one's emotions, empathy, motivation, and social competence) was delivered by regular classroom teachers who were trained in delivery of the SET intervention - teachers supplied SET to students in Grades 4 and 5 twice a week (45 minutes), and students in Grades 6 to 9 once a week (45 minutes) - questionnaires were administered to the same students who remained in the program over the 5-year period (May of each year, 2000 – 2005)
Key Findings	- positive significant effects were found on five of seven variables: internalizing problems, externalizing problems, mastery (reflecting self-efficacy or hopelessness), self-image and self-esteem, and contentment in school - no relationship between the intervention and the promotion of social skills - no detectable long-term impact on bullying
Strengths	- longitudinal design - controlled intervention - long-term training and monitoring of teachers to ensure fidelity of intervention
Weaknesses	- attrition

8. Title	**Promoting children's mental, emotional and social health through contact with nature: A model**
Authors, publication date, DOI #/PMID, ISBN	Maller, 2009 10.1108/09654280911001185
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments, Partnerships and Services
Learning Domain(s)	Affective
Measure(s) of Student Achievement	Self-esteem, engagement with school, sense of empowerment
Methodology	Qualitative methods study
Location(s)	Melbourne, Australia
School Level	Elementary schools
Purpose of Evaluation	To determine the importance of hands-on contact with nature at school for children's mental health and wellbeing as perceived by principals, teachers, and other educators in the environmental education industry.
Sample Population	Principals, teachers, representatives from leading environmental education organizations
Research Instrument(s)	Semi-structured interview guides
Method	- teachers and principals who had taken part in an earlier quantitative study were purposefully selected to participate based on: completion of prior questionnaire, more than one activity involving hands-on contact with nature must have been conducted, activities were multidimensional, and a number of grade levels participated in the activity - principals were asked to nominate the most appropriate teacher involved in the activities for an interview - individuals from environmental education organizations were purposefully selected based on their knowledge with the area in question and time and willingness to participate - interviews were conducted until saturation was reached
Key Findings	- activities involving hands-on contact with nature were perceived by educators to improve self-esteem, engagement with school, and sense of empowerment. - different types of findings are perceived to have different outcomes
Strengths	- identified indicators important to educational stakeholders - contributed empirical findings to a relatively new research area
Weaknesses	- sample potentially biased towards positive view of hands-on nature activities - did not directly interview children.

9. Title	**Schools' mental health services and young children's emotions, behaviour, and learning**
Authors, publication date, DOI #/PMID, ISBN	Reback, 2010 10.1002/pam.20528
CSH Pillar(s)	Teaching and Learning, Healthy School Policy
Learning Domain(s)	Cognitive, Behavioural, Affective
Measure(s) of Student Achievement	Internalizing and externalizing problems, academic test scores, teachers' perceptions of school climate, teachers' perceptions of instructional problems due to student misbehaviour
Methodology	Quantitative methods study
Location(s)	USA
School Level	Elementary schools
Purpose of Evaluation	To examine how changes in states' elementary school counsellor policies have influenced school climate over time, as measured by teachers' responses to surveys. Additionally, to review the literature related to elementary school counselling and young children's mental health.
Sample Population	State school districts, students (Grade 3)
Research Instrument(s)	- state-wide school policy information regarding elementary school counsellors - national survey
Method	- collected school counsellor elementary school policy information from state administrators (from all 50 states) - differences in policy then linked to the children's data from the Early Childhood Longitudinal Survey – Kindergarten (ECLS-K) cohort survey (**n = ~9,000**) following students from Kindergarten to Grade 3 - used stratified sampling methods, with schools containing classrooms randomly selected from these schools
Key Findings	- states with more counsellors or that provide students with more access to counsellors showed better emotional, behavioural, and academic outcomes
Strengths	- national coverage in the USA - linking policy with individual students' data
Weaknesses	- policy analyses were correlational , so not possible to examine causality

10. Title	**Sense of belongingness in the urban school environments of Aboriginal youth**
Authors, publication date, DOI #/PMID, ISBN	Richmond, Smith, & The Wabano Centre for Aboriginal Health, 2012 http://ir.lib.uwo.ca/iipj/vol13/iss1/1
CSH Pillar(s)	Social and Physical Environment, Partnerships and Services, Healthy School Policy
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	School environments (e.g., relationships with teachers, enjoyment of subject matter, enjoyment of learning, enjoyment of friendships and after-school activities, feelings of exclusion/inclusion), school experiences (e.g., out-of-class activities, academic achievement, feelings of belongingness, bullying, problems with teachers, failing courses), social support (e.g., guidance from peers, teachers, principals, guidance counselors, and families)
Methodology	Qualitative methods study
Location(s)	Ottawa, ON 
School Level	Secondary schools (ages 13–17)
Purpose of Evaluation	To examine Aboriginal at-risk youths' perceptions of their urban environments, including social support
Sample Population	Aboriginal youth, aged 13 to 17 (10 First Nations, 4 Inuit) who had lived in Ottawa for at least the previous 5 years and who were living below the poverty line, living in foster care, or living in difficult home situations.
Research Instrument(s)	Focus group interviews
Method	- Focus group interviews at a single time point - Divided into groups by the Wolf Pack employees to provide a balanced representation of age, grade level, and gender across 3 groups - once transcribed, focus group interviews were analysed using a general inductive approach
Key Findings	- students are negatively influenced by bullying and violent school behaviours - many Aboriginal students do not seek help from social support networks at schools - lack of feelings of belongingness due to cultural and social segregation at their schools - level of trust is key in Aboriginal youths' help-seeking behaviours and sense of belonging -teacher s and staff need to learn how to provide a wide range of supports for the realities of the difficult home situations - need for implementation of cultural safety focus in schools and more relevant resources
Strengths	- in-depth examination of and unique focus on Aboriginal at-risk youths' perceptions of their school environment and available supports -focus groups allowed youth to elaborate on shared experiences
Weaknesses	- possible limited generalizability due to sample only from Aboriginal youth in an urban setting, in a single city in Canada - focus group methodology may have limited youths' perceptions and depth of individual experiences in comparison to individual interviews

APPENDIX F: GREY LITERATURE IN THE COGNITIVE DOMAIN

1. Title	**The Association Between School-Based Physical Activity, Including Physical Education, and Academic Performance**
Authors, publication date, DOI #/PMID, ISBN	Centers for Disease Control and Prevention [CDC]. Atlanta, GA: US Department of Health and Human Services; 2010. Retrieved from: http://www.cdc.gov/healthyyouth/health_and_academics/pdf/pa-pe_paper.pdf
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive, Behavioural, Affective
Measure(s) of Student Achievement	1) cognitive skills and attitudes, 2) academic behaviours, and 3) academic achievement. Graduation or dropout rates, Performance on standardized tests, Academic grades/GPA Years of school completed, Time on task, Concentration or attentiveness in educational settings, Attendance, Disciplinary problems, School connectedness
Methodology	Review synthesis
Location(s)	International
School Level	Elementary and secondary schools
Purpose of Evaluation	To synthesize the scientific literature that has examined the association between school-based physical activities, including physical education, and academic performance, including indicators of cognitive skills and attitudes, academic behaviors, and academic achievement.
Sample Population	Children (5-18 years)
Research Instrument(s)	Studies were identified through a search of nine electronic databases using a pre-established set of search terms that included both physical activity and academic-related terms. Additional studies were located from reference lists of the identified articles.
Method	-For this review, 50 studies (in 43 articles) in relevant research articles and reports were identified through a search of nine electronic databases, using both physical activity and academic-related search terms. The search yielded 406 articles initially. -Coded data from the articles were used to categorize and organize studies first by their physical activity context (i.e., physical education, recess, classroom-based physical activity, and extracurricular physical activities), and then by type of academic performance outcome.
Key Findings	-providing recess to students on a regular basis may benefit academic behaviours, while also facilitating social development and contributing to overall physical activity and its associated health benefits. There was no evidence that time spent in recess had a negative association with cognitive skills, attitudes, or academic behaviour. -incorporating movement activities and physical activity breaks into the classroom setting may improve student performance and the classroom environment.
Strengths	-Study used systematic process for locating, reviewing, and coding the studies. Studies were found using an extensive array of search terms and international databases and were reviewed by multiple trained coders. The studies covered a broad array of contexts in which youth participated in school-based physical activities and spanned 23 years. Most (64%) studies included in the review were intervention studies, with 76% longitudinal.
Weaknesses	-The breadth of the review was a limitation. All studies meeting the established review criteria were included and treated equally, regardless of the study characteristics (e.g., design, sample size). The studies were not ranked, weighted, or grouped according to their strengths and limitations.

2. Title	**Research Review: School-Based Health Interventions and Academic Achievement**
Authors, publication date, DOI #/PMID, ISBN	Dilley, 2009 Retrieved from: http://sboh.wa.gov/Pubs/docs/Health&AA.pdf
CSH Pillar(s)	Social and Physical Environments, Healthy School Policies
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Student reports of grades
Methodology	Review synthesis
Location(s)	Washington State, other states in the USA
School Level	Middle and secondary schools
Purpose of Evaluation	This report summarizes what the research demonstrates about academic achievement and health, so that administrators, teachers, school staff, and communities can make educated decisions about how to prioritize health interventions in their schools.
Sample Population	Students
Research Instrument(s)	Washington State Healthy Youth Survey, 2006 Review of studies relating to school health and academic achievement
Method	Quantitative analysis: report examines 13 key physical and mental health risk factors and analyzes the relationship between these specific health factors and the grades students report getting in school.
Key Findings	Author and Consultants/Reviewers identified seven groups of effective school-based interventions showing a positive impact on both health-related factors and achievement-related factors. Each of these groupings represents multiple studies: 1) handwashing; 2) cognitive/social skills training; 3) parent/teacher communication skills training; 4) increased physical activity; 5) school breakfast programs; 6) chronic disease management training; and 7) school-based health centers.
Strengths	Report recommends Key Ingredients for Success: 1. Convene a school health advisory committee and designate school coordinators 2. Conduct an assessment and review data 3. Develop and implement a plan 4. Evaluate results and continuously improve 5. Create policies that support school health 6. Identify sufficient resources to succeed
Weaknesses	This is not a systematic review of studies.

3. Title	**Breakfast at the Desk: The Impact of Universal Breakfast Programs on Academic Performance**
Authors, publication date, DOI #/PMID, ISBN	Dotter, 2012 Retrieved from: http://econweb.ucsd.edu/~ddotter/pdfs/Dotter_JMP_Manuscript.pdf
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	Students' assignment completion rates, attendance records, report cards, standardized testing scores
Methodology	Quantitative methods study
Location(s)	San Diego Unified School District (SDUSD), USA
School Level	Elementary schools
Purpose of Evaluation	This paper utilizes the spread-out implementation of a new "Breakfast in the Classroom" program (BIC) across San Diego elementary schools, which provides free breakfasts to all students during class time.
Sample Population	Students
Research Instrument(s)	Student Administrative Data, California Standards Test
Method	-student administrative data are combined with information on whether and when each school began the BIC program -longitudinal view is used to tracks students' educational careers for as long as they attended any school within SDUSD -proportion of students eligible for FRP meals and the number of meals served in each school were observed -test scores used as outcomes are student results from the California Standards Test (CST) in English language arts (ELA) and mathematics
Key Findings	-implementing an in-class, universally free breakfast program in elementary schools with relatively low income levels increases breakfast consumption in these schools by an average of 183 percent -BIC program increases English-language arts and math gains by an average of 11 and 15 percent of a standard deviation, respectively, in schools that did not previously offer universally free breakfasts - estimates of gains in later years are larger than in the initial year, though the magnitudes are not statistically different -providing universally free meals in low income schools seems to be a convincing policy for alleviating achievement gaps across socioeconomic backgrounds
Strengths	This paper overcomes the main limitations in the literature on school breakfasts by 1) using near-complete treatment to avoid within-school selection biases typical of traditional SBPs, 2) using finely detailed longitudinal data with comparable treatments, comparable outcome variables, and fixed effects, and 3) exploiting the plausibly exogenous variation in the timing of program implementations across schools, allowing for control of school-specific trends in outcomes over time that may be unrelated to school breakfasts.
Weaknesses	Implications are limited to San Diego schools and programs.

4. Title	**Nutrition and Cognitive Achievement: An Evaluation of the School Breakfast Program**
Authors, publication date, DOI #/PMID, ISBN	Frisvold, 2012 Retrieved from: www.econ.gatech.edu/files/seminars/**Frisvold**_SP2012.pdf
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Standardized assessment scores in Reading, Math and Science
Methodology	Quantitative methods study
Location(s)	USA
School Level	Elementary and secondary schools
Purpose of Evaluation	This paper investigates the impact of the School Breakfast Program (SBP) on cognitive achievement.
Sample Population	Students
Research Instrument(s)	-Data from the National Assessment of Educational Progress (NAEP) -Data from Early Childhood Longitudinal Study, Kindergarten Cohort of 1998-99 (ECLS-K),
Method	-To estimate the effect of the availability of the SBP on cognitive achievement, two distinct estimation strategies were used that rely on state mandates regarding schools' participation in the SBP as the identifying source of variation. -The first approach is a difference-in-differences (DD) specification in which the achievement outcomes among students above and below the different thresholds were compared in states with differing levels of the threshold. -The second approach is a regression discontinuity (RD) design that is based on the state mandated thresholds.
Key Findings	-State mandates that require schools to provide breakfast through the SBP substantially increase the availability of the SBP in schools and, in turn, improve math achievement by at least 9 percent of a standard deviation and reading achievement by at least 5 percent of a standard deviation.
Strengths	-Although there is ample evidence that nutrition interventions for young children in developing countries have led to increases in cognitive achievement and greater educational attainment (Pollitt et al., 1995; Maluccio et al., 2006), there is limited evidence regarding whether or not food assistance programs in the US achieve similar results. -The benefits of using NAEP data are the sample size, since NAEP is one of the largest data sets with student achievement measures, and the ability to merge the percent of FRP students in the school from the Common Core of Data.
Weaknesses	This study is based on an estimation model.

5. Title	**A Systems-based Synthesis of Research Related to Improving Students' Academic Performance**
Authors, publication date, DOI #/PMID, ISBN	Huitt, Huitt, Monetti, & Hummel, 2009 Retrieved from: http://www.edpsycinteractive.org/papers/improving-school-achievement.pdf
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments, Healthy School Policies
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Standardized achievement tests
Methodology	Review synthesis
Location(s)	International
School Level	Elementary and secondary schools
Purpose of Evaluation	-review of research related to improving academic achievement in basic skills -Hattie's (2009) review of over 800 meta-analyses of variables related to school achievement is the primary source of identifying classroom and school variables that can be addressed by educators
Sample Population	Studies with an effect size of 0.40. School-aged children
Research Instrument(s)	Hattie's (2009) review of over 800 meta-analyses of variables related to school achievement is the primary source.
Method	-Reviewed research-based factors impacting student achievement using a systems approach -Established a cut-off criterion using effect size to reduce the number of variables to be considered as part of a school-reform effort and used a framework for categorizing those variables -Huitt (2003) developed a framework that can assist in this process by identifying a small number of categories of variables and the relationships among them -This framework presents a systems-based approach to considering factors related to school achievement by identifying home, school-level, and classroom-level variables and showing how they are interrelated
Key Findings	-study found that the most direct impact on student achievement is what students and teachers do in classrooms -research showing the significance of providing formative evaluation data to teachers on effectiveness of their classroom practice points to the importance of collecting data on intermediate student outcomes as a core element of putting research into practice -authors recommend that the collection of baseline data for the three components of ALT (time-on-task, content overlap, and success) provide an initial focus for school reform efforts
Strengths	-Using a modified set of Huitt's categories and subcategories and selecting only variables that have an effect size of 0.40 or greater, the number of variables identified by Hattie can be reduced from 138 to 66.
Weaknesses	-Selection criteria may be biased as the cut-off effect size of 0.40 would not include some studies (i.e., studies with variables with 0.39 effect size).

6. Title	**Educating the Student Body: Taking Physical Activity and Physical Education to School**
Authors, publication date, DOI #/PMID, ISBN	Institute of Medicine [IOM], May 23, 2013 Retrieved from: http://www.nap.edu/catalog.php?record_id=18314
CSH Pillar(s)	Social and Physical Environment, Healthy School Policies, Partnerships and Services
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Cognitive processing speed, attentional resources, standardized academic tests
Methodology	Review synthesis
Location(s)	USA
School Level	Elementary and secondary
Purpose of Evaluation	The Institute of Medicine (IOM) was requested to conduct a review of the current state of physical activity and physical education efforts in the school environment (including before, during, and after school). This report examines the influences of physical activity and physical education on the short- and long-term physical, cognitive and brain, and psychological health and development of children and adolescents.
Sample Population	Children and adolescents
Research Instrument(s)	Internet searches of relevant databases
Method	-Committee used systems approach to define the overall system of policies and regulations at multiple levels that influence physical activity and physical education in the school environment -over 1,000 articles and reports were identified from peer-reviewed published literature and from organizations relevant to physical education, physical activity and health
Key Findings	-much of the evidence to date relating physical activity to health comes from cross-sectional studies showing associations between physical activity and aspects of physical health -more physically active children demonstrate greater attentional resources, have faster cognitive processing speed, and perform better on standardized academic tests
Strengths	-utilized a systems approach -exhaustive search of 1,000 articles
Weaknesses	-data are US-based and majority of studies cross-sectional.

7. Title	**Coordinated school health programs and academic achievement: A systematic review of the literature**
Authors, publication date, DOI #/PMID, ISBN	Murray, Low, Hollis, Cross, & Davis, 2007 PMID: 17970862
CSH Pillar(s)	Healthy School Policies
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Course grades, grade point averages (GPAs), attendance, tardiness, home- work performance, study skills, classroom behaviour, social skills, disciplinary action such as suspension or expulsion, dropout status, grade promotion, grade retention, educational aspirations, and/or performance on standardized tests.
Methodology	Review synthesis
Location(s)	USA
School Level	Elementary and secondary schools
Purpose of Evaluation	This article presents a systematic review of the literature to examine evidence that school health programs aligned with the Coordinated School Health Program (CSHP) model improve academic success.
Sample Population	Students
Research Instrument(s)	Analytic framework provided by the Community Preventive Services Task Force
Method	-A multidisciplinary panel of health researchers searched the literature related to academic achievement and elements of the CSHP model to identify scientifically rigorous studies of interventions. Study designs were classified according to the analytic framework provided in the Guide developed by the Community Preventive Services Task Force. -For the purposes of this research review, the term evidence includes: (1) information that is appropriate for answering questions about an intervention's effectiveness; (2) the applicability of effectiveness data; (3) the intervention's other effects (i.e., side effects, intended or unintended, and health or non-health outcomes); and (4) barriers that have been observed when implementing interventions.
Key Findings	-Scientifically rigorous evaluation of school health programs is challenging to conduct due to issues related to sample size, recruitment, random assignment to condition, implementation fidelity, costs, and adequate follow-up time. However, school health programs hold promise for improving academic outcomes for children.
Strengths	-The study considered strong evidence to be supplied by a randomized controlled trial of an intervention that clearly incorporates components of the coordinated school health model and measures academic outcomes.
Weaknesses	-Outcome variables of interest for these programs have not included academic outcomes. In the future, school health programs need to be evaluated on their influence on academic performance variables to build the literature supporting school health programs for enhancing academic outcomes. Meanwhile, there is evidence that implementing school health programming incorporating social skills training in health education, breakfast programs, physical education, mental health services, health services, and parental and community involvement will improve students' chances for academic success.

8. Title	**Mental health and Academic Achievement: Role of School Nurses**
Authors, publication date, DOI #/PMID, ISBN	Puskar & Bernardo, 2007 PMID: 17956370
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	Grades, Concentration in class, Regular Attendance, Class Participation & Engagement
Methodology	Review synthesis: Analyses of Surveys (i.e., School Mental Health Services in the United States, 2002-2003 by US DHHS, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, 2006)
Location(s)	USA
School Level	Elementary, middle, and secondary schools
Purpose of Evaluation	A discussion on how school nurses promote mental health and subsequent academic achievement by screening and referral for children demonstrating mental health problems.
Sample Population	Children and Adolescents
Research Instrument(s)	Discussion of relevant literature and studies
Method	Article discusses 1. Mental Health and Academic Achievement 2. Role of School Nurses 3. Individual-Focused Nursing Practice 4. Systems-Focused Nursing Practice 5. Community-Focused Nursing Practice
Key Findings	-To improve academic achievement, schools are suggested to focus their efforts on the psychosocial issues that affect learning and not only focus on improving learning itself. -School nurses promote mental health and academic achievement through: teaching, screening, and collaborating with pediatric and psychiatric specialist nurses, teachers, counsellors, and families at the individual, systems, and community levels.
Strengths	Overview of the role of School Nurses and Mental Health issues in Schools using different levels of nursing interventions: individual, systems, and community. Discussion by key experts.
Weaknesses	Discussion does not include selection criteria for studies and a framework for their analysis of the data is not presented.

9. Title	**The impact of physical education and sport on education outcomes: a review of literature**
Authors, publication date, DOI #/PMID, ISBN	Stead & Nevill, September 2010 https://secure.ausport.gov.au/__data/assets/pdf_file/0010/456904/Nevill_-_Literature_review_Impact_of_PE_and_sport_on_education_outcomes_Oct_2010.pdf
CSH Pillar(s)	Social and Physical Environment
Learning Domain(s)	Cognitive
Measure(s) of Student Achievement	Academic achievement tests
Methodology	Review synthesis
Location(s)	International
School Level	Elementary and secondary schools
Purpose of Evaluation	To examine the impact of physical education and sport on academic achievement and on the wider social outcomes which might influence academic achievement and other facets of school performance.
Sample Population	Children and adolescents
Research Instrument(s)	Internet search
Method	-Studies which have examined physical activity in a wide-ranging sense are incorporated in the review. The review includes academic peer-reviewed journal articles and other sources of information such as published reports.
Key Findings	-well-controlled longitudinal studies generally support cross-sectional research, suggesting that academic achievement is maintained or enhanced by increased physical education, physical activity or sport -further research is needed to establish the optimal intensity and duration for cognitive stimulation in young people -as little as 10 minutes of additional organized physical activity in or outside the classroom implemented into the school day improves classroom behaviour, and consequently may enhance academic performance
Strengths	-study includes a focus on longitudinal intervention studies, several of which have been well-controlled. -succinct introductions and summaries to each section.
Weaknesses	-reviewers do not provide method of analysis or reasons for inclusion of studies.

10. Title	**The impact of health and health behaviours on educational outcomes in high-income countries: A review of the evidence**
Authors, publication date, DOI #/PMID, ISBN	Suhrcke & de Paz Nieves, 2011 ISBN 978 92 890 0220 2
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	1. level or years of education achieved, dropping out, college enrolment 2. GPA or grades, grade repetition, days of class missed or skipped (truancy)
Methodology	Review synthesis
Location(s)	International
School Level	Elementary and secondary schools
Purpose of Evaluation	This study systematically reviewed the current knowledge of the effect that different health conditions and unhealthy behaviours can have on educational outcomes in the context of rich countries. Does poor health during childhood or adolescence have a significant impact on educational achievement or performance? Does the engagement of children and adolescents in unhealthy behaviours determine their educational attainment and academic performance? The focus of this review and the main question to be addressed within the framework was the extent to which the selected risk factors and health conditions have a significant effect on educational outcomes.
Sample Population	Children and Adolescents
Research Instrument(s)	Online databases were the primary source of the reviewed literature. The search was conducted in three main thematic areas: health and public health, socioeconomic studies and research, and education.
Method	-Initially 273 articles were selected on the basis of the research topic. The selection was narrowed to 123 using the specific relevant indicators as the main inclusion criteria. The search was further restricted to 70 based on the age range of the study subjects, the country, and the publication year. All papers were stored in an Endnote database, and in the process their abstracts and in most cases the entire paper were screened and a final selection on the basis of the source and methodology used was carried out. In the end, 53 papers endured.
Key Findings	-evidence provides overwhelming support for the relationship between childhood and adolescent health and educational outcomes. Overall, the studies reviewed found a negative correlation between risky health behaviours and (ill) health conditions on the one hand and, on the other, education as measured through both educational achievement and academic performance.
Strengths	-A geographical bias was noted in the research, which has been mostly based in the United States and possibly affected the availability of more appropriate data sources. More data sets in European countries and the use of those data sets are recommended to further explore the idea that investments in health would lead to better educational outcomes.
Weaknesses	The entire literature was not exhaustive.

APPENDIX G: GREY LITERATURE IN THE BEHAVIOURAL DOMAIN

1. Title	**Evaluation of the National Healthy Schools Programme [NHSP]: Final report**
Authors, publication date, DOI #/PMID, ISBN	Arthur, Barnard, Day, Ferguson, Gilby, Hussey, Morrell, & Purdon, 2011 (National Centre for Social Research) http://www.natcen.ac.uk/study/evaluation-of-national-healthy-schools-programme
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments, Healthy School Policy, Partnerships and Services
Learning Domain(s)	Behavioural
Measure(s) of Student Achievement	Student engagement, school discipline referrals
Methodology	Mixed methods study
Location(s)	England
School Level	Primary and secondary schools
Purpose of Evaluation	To evaluate the effect of the NHSP on students and schools. The NHSP was launched in 1999 by the Department of Health and Department for Education with the aim of supporting schools to take a whole school approach to promoting the health and wellbeing of children and young people. The overall aims of the Programme were to support children and young people in developing healthy behaviours, raise pupil achievement, reduce health inequalities, and promote social inclusion.
Sample Population	Students, Healthy Schools (HS) coordinators, head teachers
Research Instrument(s)	Questionnaires, interview guides
Method	- **n=152** schools (102 primary and 50 secondary) completed the baseline and follow-up student questionnaires - baseline student surveys were held in fall 2007 and spring 2008, and the follow-up student surveys were held in fall 2009 and spring 2010; the overall response rate at the school level for student surveys was 27 per cent (34% in primary schools and 20% in secondary schools) - at the beginning of the study (2007), interviews were conducted with either the head teacher and/ or healthy schools co-ordinator in a sub-sample of 16 mainstream schools taken from the schools involved in the surveys. In addition, four Pupil Referral Units (PRUs) and four special schools were selected - half way through the study (summer 2009), interviews were conducted with the head teacher and/ or healthy schools co-ordinator in each of the 16 schools and four PRUs and special schools
Key Findings	- 8% of HS Coordinators noted that NHSP initiatives led to students being less disruptive and more involved in decision-making in school - head teachers mentioned that introducing boxercise class resulted in participants in the class displaying fewer angry behaviours in classrooms and more engaged behaviours in schoolwork - schools informally observed improvements to students' behaviours since introducing healthier food, with reduced incidences of disruption and better classroom
Strengths	- longitudinal study allows for an examination of change in behaviours to an extent
Weaknesses	- an evaluation over a two-year period may not be sufficient to examine change and sustainability.

2. Title	**Exploring the role of the school nurse in promoting student achievement: A discussion paper and final results of focus groups**
Authors, publication date, DOI #/PMID, ISBN	Capparelli, 2003 (New York Statewide School Health Services Center) http://www.schoolhealthservicesny.com/uploads/ExploringSchoolNurseRole.pdf
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments, Partnerships and Services
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	School attendance
Methodology	Mixed methods study
Location(s)	New York, USA
School Level	Pre-Kindergarten-Grade 12
Purpose of Evaluation	To explore the role of the school nurse in promoting academic achievement. *Exploring the Role of the School Nurse in Promoting Student Achievement* is an initiative designed by the New York Statewide School Health Services Center to increase communication and understanding among school administrators and school nurses about the relationship between academic success and healthy behaviours on the part of students.
Sample Population	School principals, school nurses
Research Instrument(s)	Survey, interview guides for focus group sessions
Method	- Each person from the 8 focus groups participated in a survey before the sessions - conducted focus group sessions with school principals and school nurses across the state of New York - 70 individuals including 23 school principals and 47 school nurses came together in eight focus groups across the State - both school nurses and principals represented the full range of wealth and poverty in districts, as well as a range of urban, suburban, and rural districts, and schools from Pre-K through Grade 12
Key Findings	- pre-survey: both groups agreed that schools needed to attend to barriers to learning; and that student learning and achievement were affected by not only what occurred in the classroom but also the health of both students and the school environment - nurses noted the importance of medical screenings and assessments for vision and hearing; helping students and parents manage medical conditions to reduce their impact on school attendance; and preventive actions that helped students be healthy and stay healthy; principals concurred that students needed to be healthy to do their best in school, and, absent good health, a child could not learn; principals said that by keeping students in school and attending to their health, school nurses had a direct impact on promoting academic achievement - both school nurses and principals clearly indicated that the role of care provider was the most important role of the school nurse with 60% of the school nurses and over 90% of the principals rating that role as the most important
Strengths	- included qualitative data (focus group interviews) and quantitative data (surveys) - included systematic literature review, from which a conceptual framework was created
Weaknesses	- students' and teachers' perspectives were not included in sample.

3. Title	**21st century community learning centers at Children's Aid Society Community Schools**
Authors, publication date, DOI #/PMID, ISBN	Children's Aid Society [CAS], 2008 http://www.aypf.org/documents/CASCommunitySchoolsEvaluationSummary.pdf
CSH Pillar(s)	Teaching and Learning, Partnerships and Services
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	School attendance, standardized test scores, student engagement in schools, student engagement with their communities, community involvement
Methodology	Mixed methods study
Location(s)	New York City, USA
School Level	Middle schools
Purpose of Evaluation	To explore the effects of the Children's Aid Society (CAS) community schools afterschool programs on students' academic achievement, school attendance, and youth development outcomes. Community schools are designed to support and enhance educational opportunities by addressing the full developmental needs of young people and by decreasing barriers to learning through medical, dental, mental health, and social services. A typical CAS afterschool program begins with a 20-minute snack or supper, followed by homework help, academic enrichment, and youth development activities.
Sample Population	Students, teachers, school staff, parents, community members
Research Instrument(s)	Community Schools Information System (CSIS) database, standardized tests data, surveys, interview guides for individual and focus group interviews
Method	- 3-year longitudinal comparison study, quasi-experimental design - **n=6** CAS community middle schools, students in Grades 5-8 (one cohort followed) - students who participated in CAS afterschool programs were compared to those who did not participate - the entire sample for academic achievement/attendance measurements was n=5,163, or all youth who attended the 6 middle schools. Of these, n=1,766 were 8th graders (the cohort being studied) by Year 3 of the evaluation - n=246 youth who completed the survey in spring 2007 were the final longitudinal cohort for the youth development survey - for the academic achievement/attendance component measures, baseline data collected in Year 1 included student demographics and standardized test scores - used teacher responses to the 21st Century Annual Performance Review teacher survey
Key Findings	- there was an increase in academic achievement and positive youth development for CAS participants over nonparticipants - students enrolled in CAS programs had higher school attendance than non-participants
Strengths	- control and intervention groups - longitudinal study allows for an examination of change in behaviours
Weaknesses	- outcomes cannot be attributed in a causal way to the program; only association is possible due to the research method used. However, plausible arguments for causality are strengthened because outcomes hypothesized in the Theory of Change are those found. For Year 3, the significance cut-off was .05, indicating 95% confidence that the outcome did not occur by chance.

4. Title	**Fast Track Prevention Trial for Conduct Problems**
Authors, publication date, DOI #/PMID, ISBN	Conduct Problems Prevention Research Group [CPBRG], Pennsylvania State University, 2009 http://www.designedinstruction.com/learningleads/fast-track-prevention.pdf
CSH Pillar(s)	Social and Physical Environments, Partnerships and Services
Learning Domain(s)	Behavioural
Measure(s) of Student Achievement	Disruptive classroom behaviours, relationships between student-teacher and student-parents, parental involvement
Methodology	Mixed methods study
Location(s)	USA (North Carolina, Tennessee, Washington, and Pennsylvania)
School Level	Pre-school through Grade 6
Purpose of Evaluation	To evaluate the impact of Fast Track Prevention Trial for Conduct Problems on students' conduct problems in classrooms. The program components include parent training; home visitations to reinforce parenting and problem-solving skills; social skills training to enhance children's problem-solving skills, peer relations, anger control, and friendship maintenance; academic tutoring to improve children's reading skills; and a classroom teacher-led curriculum (PATHS), a program designed to be used in Grades 1-5 to help children develop emotional awareness skills, self-control, and problem-solving skills, foster a positive peer climate, and promote parent participation.
Sample Population	Students, teachers
Research Instrument(s)	Questionnaires, teacher reports of behaviour management, peer reports of aggression
Method	- this randomized clinical trial involved **n=198** intervention and **n=180** comparison classrooms from neighbourhoods with greater than average crime in 4 US locations (i.e., North Carolina, Tennessee, Washington, and Pennsylvania); within each site, approximately 12 elementary schools in high-risk neighborhoods (or towns in the case of rural Pennsylvania) were invited to be involved in the Fast Track intervention model - in the intervention schools, Grade 1 teachers delivered a 57-lesson social competence intervention focused on self-control, emotional awareness, peer relations, and problem solving
Key Findings	- intervention students had better teacher and parent ratings on behaviour with peers and adults and better overall ratings by observers on aggressive and/or disruptive classroom behaviour - mothers of intervention children were found to exhibit more involvement in their children's activities, and parents in general to be less likely to endorse physical punishment - intervention students were less likely to consider their peers as aggressive - pre–post differences in teacher ratings of classroom aggression and disruption indicated an increase in both groups; that is, all teachers saw their classroom as more disruptive in the spring than they did in the previous fall. This finding is likely due to a combination of greater familiarity with students (and thus observation of more incidences of misbehaviour) and the fact that children often show more disruption later in the classroom year than in the first few weeks (at which time they are often "on their best behaviour")
Strengths	- control and intervention groups - longitudinal study allows for an examination of change in behaviours
Weaknesses	- although analyses with and without these high-risk children showed similar patterns, it is quite possible that effects of the intervention on the non-high-risk children depended on a simultaneous intervention with the high-risk children

5. Title	**School-based health centers enhance access to mental health services for adolescents, particularly African-American and Hispanic males**
Authors, publication date, DOI #/PMID, ISBN	Connecticut Association of School Based Health Centers [CASBHC], 2009 http://www.innovations.ahrq.gov/content.aspx?id=3843
CSH Pillar(s)	Teaching and Learning, Partnerships and Services
Learning Domain(s)	Behavioural
Measure(s) of Student Achievement	School attendance
Methodology	Mixed methods study
Location(s)	Connecticut, USA
School Level	Elementary, middle, secondary schools
Purpose of Evaluation	To examine the effects of school-based health centers on levels of student satisfaction and school attendance. While school-based health centers were established in the 1980s offering primary care services in Connecticut elementary, middle, and secondary schools, it was not until 1994 that the mental health services component was added to these centers. Mental health services include one-on-one, family, and group counselling. Easy-to-access services are co-located with primary care and acute medical services so as to reduce the stigma associated with accessing them. All mental health care adheres to State-developed standards related to staffing and the types of services offered.
Sample Population	Students
Research Instrument(s)	School attendance records, school-based health center databases, interview guides
Method	- the evidence consists of post-implementation data on use of mental health services by students - interview data from adolescents (**n not specified**) on the quality, timeliness, and value of those services
Key Findings	- school-based health centers have enhanced access to mental health services and generated high levels of satisfaction (particularly among African-American and Hispanic males), and led to less missed class time - between 2006 and 2009, mental health services were the most frequently used services in centers, responsible for roughly one-third (32%) of all visits - the majority (96.7%) of students using the school-based health centers (either the medical or mental services) returned to class the same day, so they missed less school than if they had to access such service elsewhere in the community
Strengths	- targeted student populations that had a disproportionate number of school absents and low achievement
Weaknesses	- lack of information on program implementation in this report - lack information about sample size and details about research method.

6. Title	**After school programs in the 21st Century: Their potential and what it takes to Achieve it**
Authors, publication date, DOI #/PMID, ISBN	Harvard Family Research Project [HFRP], February 2008 http://www.hfrp.org/publications-resources/browse-our-publications/after-school-programs-in-the-21st-century-their-potential-and-what-it-takes-to-achieve-it
CSH Pillar(s)	Partnerships and Services
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	Academic achievement test scores, high school credits earned, school attendance rates, promotion rates, suspension rates, dropout rates
Methodology	Review synthesis: Narrative review (includes quantitative, qualitative, and mixed methods studies)
Location(s)	USA
School Level	Elementary and secondary schools (Kindergarten through Grade 12)
Purpose of Evaluation	This narrative review looks at 10 years of research on after school programs and finds implications for the future of the after school field. Two primary questions addressed were: 1) Does participation in after school programs make a difference? 2) What conditions appear to be necessary to achieve positive results? "After school" is the general term used to describe an array of safe, structured programs that provide children and youth ages kindergarten through high school with a range of supervised activities intentionally designed to encourage learning and development outside of the typical school day.
Sample Population	Students, teachers, program facilitators
Research Instrument(s)	Accessible national database of after school program evaluations by the Harvard Family Research Project (www.gse.harvard.edu/hfrp/projects/afterschool/resources/issuebrief10/companion.pdf)
Method	- studies included were evaluations of the following: - large multisite and single site after school programs - evaluations of school- and community-based models - evaluations assessing a narrow to a broad range of outcomes - key developmental research studies - key meta-analyses and research syntheses
Key Findings	- quality after school program environments foster inquiry, critical thinking, and engagement in learning; these features can support a range of positive academic and developmental behaviours and outcomes, particularly for disadvantaged children and youth - more specifically, social/emotional outcomes associated with participation in after school programs include: - decreased behavioral problems - improved social and communication skills - increased self-confidence, self-esteem, and self-efficacy
Strengths	- comprehensive research brief regarding a US national database of after school program evaluations
Weaknesses	- not all studies were included in this brief, as it is based on a subset of research - the after school field is still maturing and is using the developing knowledge to understand what is necessary for quality programming.

7. Title	**Final Report - Youth and Family Centers Program: 2005-2006**
Authors, publication date, DOI #/PMID, ISBN	Hinojosa & Oshitoye, 2006 http://www.dallasisd.org/cms/lib/TX01001475/Centricity/Shared/evalacct/evaluation/final2007/EA06-143-2-Youth-and-Family-Centers-Program-signed.pdf
CSH Pillar(s)	Social and Physical Environments, Partnerships and Services
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	School attendance, school discipline referrals
Methodology	Mixed methods study
Location(s)	Dallas, Texas, USA
School Level	Elementary, middle, and secondary schools
Purpose of Evaluation	The purpose of the evaluation was to examine four major areas: context of the program, program budget, implementation of the program, and outcomes for students participating in the program. The Youth and Family Centers program is a school-based initiative that is dedicated to providing primary and preventative medical and psychological health care to students and their immediate family members. The main objectives of the Youth and Family Centers are constructed with the understanding that, by providing services that deliver social, emotional, and physical support, students can make consistent academic progress, and both family and student can achieve optimal health status.
Sample Population	Students, parents, teachers, school administrators, Youth and Family Center staff
Research Instrument(s)	Youth and Family Center Access® database, interview guides, surveys
Method	- this report includes comparisons of the 2004-2005 and 2005-2006 data - previous evaluation reports, professional journals, program records, and interviews with administrators were used to collect context data - **n=16,162** students and family members were served through the Youth and Family Centers in 2004-2005; this number declined slightly to **n=14,575** in 2005-2006 - students' recorded absences, obtained from the district's database, were reviewed for the second six-weeks cycle and fifth six-weeks cycle of the 2004-2005 and 2005-2006 school year; only clients who received services in the second six-weeks cycle and the fifth six-weeks cycle were analyzed for improvements in the fifth six-weeks cycle
Key Findings	- the majority of the client base was Hispanic, male, and attended elementary school - In 2004-2005, most respondents believed that students had much improved or improved on school work and attendance; in 2005-2006, 81.3% of respondents indicated that they believed students were much improved or improved on schoolwork and 70.6% indicated students had much improved or improved in regards to attendance - in 2004-2005, school staff perceptions of student progress were encouraging with most believing that the child was much improved (78.7%); there was a substantial improvement on this outcome in 2005-2006 with 90.2% of respondents indicating that the children being treated by the Youth and Family Centers were improved in regards to progress - Dallas school-based health centers found that medical services helped decrease absences by 50% among students who had three or more absences in a six-week period; students who received mental health services had an 85% decline in school discipline referrals
Strengths	- utilized longitudinal data - included the voices of various stakeholders
Weaknesses	- missing data in the Youth and Family Center Access® database.

8. Title	**Health Impact Assessment [HIA] of early school leaving, absenteeism and truancy**
Authors, publication date, DOI #/PMID, ISBN	Limerick Health Promotion [LHR], 2008 http://www.publichealth.ie/files/file/Hia%20ESL%20NEWdoc09.pdf
CSH Pillar(s)	Social and Physical Environments, Healthy School Policy
Learning Domain(s)	Behavioural
Measure(s) of Student Achievement	School attendance, truancy rates, early school leaving, graduation rates
Methodology	Qualitative methods study
Location(s)	Limerick City, Ireland
School Level	Elementary and secondary schools
Purpose of Evaluation	To examine the relationship between student health and early school leaving, absenteeism, and truancy. The working group for this HIA comprised of key stakeholders working in the area of early school leaving, prevention and the promotion of school attendance, participation, and retention.
Sample Population	Students, parents, school staff, and educational support agencies
Research Instrument(s)	Census data, interview guides for focus group sessions with school staff and educational support agencies, parent questionnaires, school records
Method	- students from both mainstream and alternative education systems were involved in this consultation process. All students under the age of 16 years had to receive signed consent from their parents / guardians to be involved - two mainstream schools (two focus groups): - One junior cycle class of 8 students (4 males, 4 females; aged 12 years old) - One senior cycle class of 10 students (3 males, 7 females; aged 15-16 years old) - three alternative education centres/schools (four focus groups): - 28 plus students (11 males, 17 females approximate age 12 -18 years)
Key Findings	- Education Achievement levels (Census, 2006): The census reflects a pattern of early school leaving for Limerick City, vis-a-vis national averages. Also highlighted is the fact that enrolment to Further Education & Higher Education level education is significantly lower in the areas profiled. - Early School Leavers (Census, 2006): This report highlights that there is a high percentage of early school leavers in Limerick City [4% higher than the national average]. The highest incidence of early school leaving exists in the St. Mary's Park area of Limerick City - John's A (55.4%) - poor social relationships are often associated with poor health - physical and psychological symptoms (head ache, stomach ache, back pain, dizziness, difficulty getting to sleep) in adolescents. These symptoms were also found to have a potential influence on school attendance, particularly in relation to scenarios of bullying and concerns over safety - consultation was conducted with staff from mainstream and alternative education settings
Strengths	- multiple stakeholders' perspectives shared
Weaknesses	- consultation with parents proved to be a challenging part of this process, as some parents of children who had left school early found the subject proved very painful for them when interviewed. Therefore, parent interviews were fewer than planned.

9. Title	**Roots of Empathy 2010 feedback report New Brunswick**
Authors, publication date, DOI #/PMID, ISBN	Roots of Empathy [ROE], 2010 http://www.rootsofempathy.org/documents/content/ROE_New_Brunswick_Feedback_Report_2009-10.pdf
CSH Pillar(s)	Teaching and Learning, Partnerships and Services
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Pro-social behaviours, empathy
Methodology	Mixed methods study
Location(s)	New Brunswick 
School Level	Elementary schools
Purpose of Evaluation	To evaluate the effectiveness of the Roots of Empathy (ROE) program. This program aims to explore and develop K-5 students' social and emotional literacy, and safety, by supporting pro-social behaviours and reducing aggression through a comprehensive curriculum. ROE's mission is to build caring, peaceful, and civil societies through the development of empathy in children and adults.
Sample Population	Students, teachers
Research Instrument(s)	Questionnaires, interview guides
Method	- **n=13000** students took part in ROE program province-wide - student and teacher questionnaires; number of questionnaires administered was unmentioned - number of student and teacher interviews conducted was unmentioned
Key Findings	- 76% of teachers strongly agreed or agreed that, as a result of ROE, students were more supportive in resolving conflicts involving classmates - 81% of teachers strongly agreed or agreed that, as a result of ROE, students showed more pro-social behaviour (e.g., sharing, helping, cooperating) by the end of the school year - 92% of students reported learning that it hurts other people's feelings when they are bullied - 86% of students reported learning that it is not okay to hurt someone's feelings just because they're feeling angry, sad, or scared
Strengths	- used quantitative and qualitative approaches - obtained perspectives from students and teachers
Weaknesses	- lack of information on sample size (information of participation obtained from ROE website) - lack of information on program implementation in this report.

10. Title	The Alberta Coalition for Healthy School Communities [ACHSC] - Evaluation report 2008/09
Authors, publication date, DOI #/PMID, ISBN	Taxbock, 2009 http://www.achsc.org/download/2009/ACHSC%202008-09%20Evaluation%20Report.pdf
CSH Pillar(s)	Teaching and Learning, Partnerships and Services
Learning Domain(s)	Cognitive, Behavioural
Measure(s) of Student Achievement	School attendance, dropout rates
Methodology	Mixed methods study
Location(s)	Alberta 
School Level	Elementary and secondary schools
Purpose of Evaluation	To evaluate the effectiveness of school health initiatives under Healthy School Communities (the provincial health strategy) in regards to the feasibility of regional school health teams, increasing awareness of school health strategies/programs/initiatives, and developing partnerships and best practices in Aboriginal Health.
Sample Population	Education and school health experts, researchers from colleges/universities, parents
Research Instrument(s)	Web-based survey composed of 17 multiple choice questions and 2 written questions
Method	- ACHSC School Health Symposium (2009) provided opportunity to discuss outcomes of regional school health meetings; brainstorming session (qualitative components of study) - web-based surveys (post-symposium) were completed by symposium participants (quantitative component of study) - n not specified (50% of attendees completed surveys; 34% of completed surveys from health sector; 47% from education sector; 19% from university/college, parents, or others)
Key Findings	- school health looks different in different parts of the province with different priorities - Aboriginal health, behavioural, and academic challenges highlighted, especially attendance and dropout rates unique to Aboriginal students in Alberta - widespread recognition of the need for more Aboriginal perspectives; there is a need for more ideas about how to promote Aboriginal health on reserves and how Aboriginal health fits with ACHSC
Strengths	- included multiple stakeholders from both the health and education sectors - included qualitative data (brainstorming results and conversation at symposiums) and quantitative data (surveys)
Weaknesses	- the first presentation/ symposium in 2008 served as an intervention, but there was no control group and the number of participants in the intervention was not mentioned - baseline measures were qualitatively based through conversations, while post-symposium measures were quantitatively based; this process made measuring outcomes a bit challenging.

APPENDIX H: GREY LITERATURE IN THE AFFECTIVE DOMAIN

1. Title	**What school administrators can do to enhance student learning by supporting a coordinated approach to health**
Authors, publication date, DOI #/PMID, ISBN	American School Health Association, 2010 Accession Number: ED51684 (ERIC)
CSH Pillar(s)	Healthy School Policy, Partnerships and Services
Learning Domain(s)	Affective
Measure(s) of Student Achievement	General locally decided health and wellbeing outcomes/goals linked to educational achievement
Methodology	Review synthesis: Summary report and recommendations for practicing administrators
Location(s)	USA
School Level	Elementary and secondary schools
Purpose of Evaluation	To provide recommendations for administrators in the promotion of positive physical, emotional, social, and environmental factors related to health and wellbeing that can affect learning.
Sample Population	Administrators
Research Instrument(s)	Position Statement
Method	N/A
Key Findings	- each district appointed one staff person to oversee and coordinate a multi-disciplinary approach for the district to support the health and well-being of students and staff. - school advisory council established and met regularly to determine district health priorities, and to examine, implement, and evaluate current healthy school policies. - recommended that administrators should consider the attitudes and behaviours that promote physical, intellectual, emotional, social and environmental health when making hiring and management decisions. - administrators implement an established system for reporting school health progress annually. - administrators allocate sufficient fiscal and human resources to support the designated coordinator in facilitating measurable academic and health outcomes.
Strengths	- immediately accessible recommendations that administrators can put into practice. - process-focused that is applicable across school contexts.
Weaknesses	- specific objectives not well defined.

2. Title	**An investigation of the implementation of a MindMatters teaching module in secondary school classrooms**
Authors, publication date, DOI #/PMID, ISBN	Askell-Williams, Lawson, Murray-Harvey, & Slee, 2005 http://www.mindmatters.edu.au/verve/_resources/classroom_full.pdf
CSH Pillar(s)	Teaching and Learning, Healthy School Policy
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Teachers' efficacy, students' knowledge, attitudes, behavioural intentions
Methodology	Mixed methods study
Location(s)	Adelaide, Australia
School Level	Secondary schools
Purpose of Evaluation	To evaluate the classroom implementation of the curriculum resource "Understanding Mental Illness" (UMI) to provide feedback about the way that the UMI materials are used in classrooms and the way that they are received by teachers, students, and administrators. UMI is one of three modules in the MindMatters program. Note: MindMatters Consortium provides curriculum resources to schools to support the teaching and learning of issues related to student mental health.
Sample Population	Administrators, teachers
Research Instrument(s)	- qualitative interviews and quantitative questionnaires distributed to teachers and administrators. - quantitative questionnaires with students.
Method	- classroom observations of the teaching of UMI modules in 3 secondary school classrooms (6 to 10 observations per school). - focused interviews with principals and classroom teachers about the UMI materials and their classroom implementation were conducted before, during, and after the UMI module. - questionnaires were administered to teachers about their efficacy for teaching the UMI module and for participating students both pre- and post-teaching of the UMI modules to investigate their knowledge, attitudes, and behvioural intentions relevant to mental illness. - near the end of the investigation, interim findings were presented to a teacher reference group for further discussion.
Key Findings	- students' knowledge, attitudes, and behavioural intentions relating to Mental Illness improved from pre-teaching to immediate post-teaching of the UMI module. - Certain modules from UMI fit best with specific age groups. - teachers indicated that they felt efficacious about their teaching abilities and that their goals for teaching were compatible with the UMI module. - many schools that were provided with UMI teaching materials were not teaching UMI modules; modules dependent on the teacher's interpretation and presentation of the materials. - lack of resources (e.g., only one UMI booklet; cost of photocopies) and lack of time were barriers to teaching UMI modules. Additionally, UMI modules were one of many wellbeing components in the curriculum, so selecting based on time constraints was a difficulty. - there is a need for pre-service and in-service professional education for teachers.
Strengths	- variety of methods used for in-depth look at implementation.
Weaknesses	- small number of classrooms observed.

3. Title	**Health and health-related behaviours among young people in Yukon**
Authors, publication date, DOI #/PMID, ISBN	Freeman, Saab, King, & Gropp, 2011 http://www.hss.gov.yk.ca/health_behaviours.php
CSH Pillar(s)	Social and Physical Environments
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Emotional and mental health, injuries, violence and bullying, eating and dieting, healthy living, health risk behaviours, peer group, family
Methodology	Quantitative methods study
Location(s)	Yukon 
School Level	Elementary and secondary schools (11, 13, and 15-year olds)
Purpose of Evaluation	Collect data and examine the relationships between contextual factors and health behaviours of young people in Canada and internationally. This report looks at the 2009 cycle of the HBSC survey in Yukon.
Sample Population	Students
Research Instrument(s)	Questionnaire
Method	- questionnaire. - single time point, cross-sectional design. - Regionally representative samples of approximately 750 students at each age group (11, 13, and 15) were drawn. - participants selected using cluster sampling with school or school class as the sampling unit.
Key Findings	- students in Yukon, regardless of grade, location, or gender, tend to have appropriate material resources within their homes. - Grade 9 and 10 rural boys viewed their school experience in the most negative light, and the least likely to feel like they belong at school (therefore not meeting their needs). - older students rated their health lower than younger students; girls rated their health lower than boys; rural students rated their health lower than urban students. - more rural students than urban students reported going to bed/school hungry because there was not enough food at home. - over half of the students reported being bullied in the last two months.
Strengths	- large, territorially representative sample (and part of a larger nationally and internationally representative sample). - multiple age groups. - examination of cross-provincial/territorial patterns.
Weaknesses	- findings not generalizable to specific contexts - correlational design, so not possible to examine causality.

4. Title	**Understanding teachers' perspectives on student mental health: Findings from a national survey**
Authors, publication date, DOI #/PMID, ISBN	Froese-Germain, Riel, & Canadian Teachers' Federation, 2012 978-0-88989-399-3
CSH Pillar(s)	Social and Physical Environment, Healthy School Policy
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Mental health related problems (e.g., anxiety disorders, learning disabilities, and depressive disorders), students requiring mental health services, bullying based on mental health status, access to multi-agency teams (health care, social services, justice, and education professionals), teacher professional development in mental health
Methodology	Quantitative methods study
Location(s)	Canada 
School Level	Elementary and secondary schools
Purpose of Evaluation	To understand teachers' perceptions of what the most significant mental health challenges are influencing students' abilities to succeed in school across Canada.
Sample Population	Teachers in Canada who are part of the Canadian Teachers' Federation (CTF)
Research Instrument(s)	- email survey
Method	- National online email survey sent to a sample pool from the CTF (elementary school teachers, **n=2,324**, high school teachers, **n=1,603**).
Key Findings	- 7 in 10 teachers surveyed reported not receiving professional development in mental health; attention deficit disorders, learning disabilities, stress, and anxiety disorders were the most prevalent concerns in terms of health-related problems in schools (greater than 73% of respondents agreed these were pressing concerns related to student health in their school). - numerous barriers exist to mental health service provision for students including the difficulty in identifying children with a mental illness. - many teachers had seen students with a mental health challenge being bullied. - only 39% of teachers reported that their school had a multi-agency team to work towards wellbeing.
Strengths	- national survey - examined many different facets of mental health
Weaknesses	- lack of indication of response rates of teachers - does not report the whole school perspective (e.g., students, administrators) - teachers who responded might have had a greater interest in student mental health.

5. Title	**MindMatters: Evaluation of the professional development program and school-level implementation – final report**
Authors, publication date, DOI #/PMID, ISBN	Hazell, 2005 http://www.mindmatters.edu.au/verve/_resources/pd_final.pdf
CSH Pillar(s)	Teaching and Learning, Partnerships and Services
Learning Domain(s)	Affective
Measure(s) of Student Achievement	School attachment, autonomy experience, self-esteem, effective help-seeking (taken from the Californian Healthy Kids Survey)
Methodology	Mixed methods study
Location(s)	Australia
School Level	Secondary schools
Purpose of Evaluation	Evaluation of the nation-wide professional development program and an in-depth study of implementation at the school level including process of uptake and implementation of MindMatters and impacts and outcomes for students, teachers, and the school as a whole.
Sample Population	Teachers, administrators, students
Research Instrument(s)	- qualitative interviews and quantitative questionnaires distributed to teachers and administrators. - quantitative questionnaires with students.
Method	- Professional Development Surveys with teachers (**n=534**). - Surveys with students (at 3-year follow-up, boys **n=1520,** girls **n=1354**). - school case studies (**n=**15) over a 3-year period with 57 visits. - telephone interviews with key informants (**n=31**).
Key Findings	- an overall improvement in school attachment, autonomy experience, and effective help-seeking scores. - no difference found in self-esteem scores over the course of the 3 years.
Strengths	- increased generalizability for specific evaluation protocol within Australia - multi-faceted study, with multiple stakeholders - longitudinal data
Weaknesses	- lack of flexibility in the model to adapt to individual school contexts. - schools reported difficulty in finding time to adopt the program.

6. Title	**An ounce of prevention – A public health rationale for the school as a setting for health promotion: A report of the provincial health officer**
Authors, publication date, DOI #/PMID, ISBN	Kendall, 2003 0-7726-5029-2
CSH Pillar(s)	Teaching and Learning, Healthy School Policy, Partnerships and Services
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Body image, mental health, school connectedness, health-promoting behaviours (e.g., physical activity, healthy eating), health-risk behaviours (e.g., obesity, sexual activity, tobacco use)
Methodology	Review synthesis: Summary report of epidemiological data and recommendations for strengthening school health education
Location(s)	British Columbia 
School Level	Elementary and secondary schools
Purpose of Evaluation	To review the epidemiology of some of the more prevalent health issues in children and youth, discuss the conceptual framework for effective school health promotion, and make recommendations for strengthening school health education.
Sample Population	Epidemiological data (students)
Research Instrument(s)	Summary report based on epidemiological data (McCreary Centre's Adolescent Health Behaviour Surveys)
Method	- epidemiological data were used from McCreary Centre's Adolescent Health Behaviour Surveys, which were distributed in 1992 and again in 1998. - these data were used in this report to emphasize the need for school health frameworks and healthy school initiatives.
Key Findings	- epidemiological data indicate numerous significant risk patterns in children and youth that could be modified to include school health promotion as a key component (e.g., school environment). - an evidence-based curriculum that runs from school entry to graduation should incorporate school health promotion. - infrastructure (including specific staff) at the provincial and regional levels should focus on the implementation of comprehensive school health promotion. - provide opportunities for teacher training at universities and in-service teachers in health promotion. - set up an ongoing evaluation process for student health. - All stakeholders and Ministries should contribute to comprehensive school health.
Strengths	- provides usable set of recommendations for increasing public health through the school systems.
Weaknesses	- focus is on a single context. - data used for report were older.

7. Title	**Cleveland metropolitan school district human ware audit: Findings and recommendations**
Authors, publication date, DOI #/PMID, ISBN	Osher, Poirier, Dwyer, Hicks, Brown, Lampron, & Rodriguez, 2008 Accession number: ED502432 (ERIC)
CSH Pillar(s)	Teaching and Learning, Social and Physical Environment, Healthy School Policy, Partnerships and Services
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Connectedness to school, mental wellness, safe and respectful environment, social and emotional learning, student support
Methodology	Mixed methods study
Location(s)	Cleveland, USA
School Level	Grade 5 and up (middle school and secondary school)
Purpose of Evaluation	To examine and identify strengths, challenges, and areas for improvement related to student mental health and the conditions for learning in the Cleveland Metropolitan School District.
Sample Population	Students (Grade 5 and up), mayor and members of his cabinet, District chief executive officer and other members of his team, Director of Health, Director of Public Safety, the city council, members of the Board of Education, leadership of the Cleveland Teachers Union, key staff and leaders from county and non-profit agencies that fund, plan, assess, and provide health-related services to youth, family members, children, and youth, members of the faith community, community activists, and state education and mental health officials
Research Instrument(s)	- surveys for students; focus group interviews with staff and community members; individual interviews with particular expertise; observations; secondary data analysis
Method	- stratified random sampling for schools (surveys) - school case studies: conducted two-day site visits to four Cleveland schools and conducted focus groups, observations of classrooms, public spaces, and special facilities. - analyzed evaluations and research relevant to district. - analyzed data from the Conditions for Learning Safety and Youth Risk Behaviour survey (previously collected data). - reviewed reports and documents that provided recommendations in agency and school collaboration and organization.
Key Findings	- factors (including behavioural, emotional, and physical) place children and schools at risk for poor school outcomes, emotional and behavioural problems and disorders, violence and an absence of effective interventions to address these risk factors. - poor or weak conditions for learning exist in many Cleveland schools, along with an absence of effective approaches to improve these conditions. - inadequate capacity to address the factors that place children and schools at risk of poor outcomes and to improve the conditions for learning, teaching, and development are underdeveloped and inconsistent.
Strengths	- breadth and depth of coverage - targeted and specific recommendations for school district - variety of data collection methods
Weaknesses	- specific to a single context.

8. Title	**The positive impact of social and emotional learning for Kindergarten to eighth-grade students: Findings from three scientific reviews**
Authors, publication date, DOI #/PMID, ISBN	Payton, Weissberg, Durlak, Dymnicki, Taylor, Schellinger, & Pachan, 2008 http://casel.org/wp-content/uploads/PackardTR.pdf
CSH Pillar(s)	Teaching and Learning, Social and Physical Environment
Learning Domain(s)	Cognitive, Behavioural, Affective
Measure(s) of Student Achievement	- Core social and emotional competencies (1.Self-awareness, 2. self-management, 3. social awareness, 4. relationship skills, 5. responsible decision making) - targeting/improving these competencies influences: social-emotional learning skills, attitudes toward self and others, positive social behaviour, conduct problems, emotional distress, academic performance
Methodology	Review synthesis: Quantitative meta-analysis of previous research
Location(s)	International
School Level	Elementary schools (Grades 1 – 8)
Purpose of Evaluation	Summarize the effects of interventions targeting social-emotional learning (SEL) on student outcomes.
Sample Population	Students
Research Instrument(s)	Meta-analytic techniques calculating effect sizes across multiple studies
Method	- Review of previous literature, including 317 studies and involving 324,303 children.
Key Findings	- SEL programs yielded multiple benefits in each review and were effective in both school and after-school settings for students with and without behavioural and emotional problems. - effective across the K – 8 grade range and for racially and ethnically diverse students from urban, rural, and suburban settings. - SEL programs improved students' social-emotional skills, attitudes about self and others, connection to school, positive social behaviour, and academic performance. - SEL programs reduced conduct problems and emotional distress. - SEL programs are among the most successful youth-development programs offered to school-age youth. - school staff carried out SEL programs effectively indicating they can be incorporated into routine. - SEL programming improved students' academic performance by 11 to 17 percentile points.
Strengths	- breadth of research analyzed. - clear conclusions drawn regarding the effectiveness of SEL programs. - strong theoretical framework.
Weaknesses	- lack of studies that included longitudinal follow-up after program completion.

9. Title	**How to conduct a school health audit: Booklet 7**
Authors, publication date, DOI #/PMID, ISBN	Queensland Health, Education Queensland, Brisbane Catholic Education Centre, & Association of Independent Schools, 2005 http://www.health.qld.gov.au/healthyschools/documents/29338.pdf
CSH Pillar(s)	Teaching and Learning, Social and Physical Environments, Healthy School Policy, Partnerships and Services
Learning Domain(s)	Behavioural, Affective
Measure(s) of Student Achievement	Community relationships, social environment, emotional/psychological health, personal skills, health promoting school, school groups issues, safety skills, safe environment, illness/accidents, health maintenance, special health needs, physical activity, nutrition, physical environment, sun protection
Methodology	Audit Tool
Location(s)	Queensland, Australia
School Level	Elementary and secondary schools
Purpose of Evaluation	The *School Health Audit* was developed to help plan and monitor activity in school as it relates to school health to identify what is currently happening at a school, identify resources, identify gaps for future planning, provide baseline information, and provide achievement information since the last audit.
Sample Population	Schools for future audits
Research Instrument(s)	Surveys
Method	- surveys distributed at the school level. - results are compiled and used to track and evaluate school health.
Key Findings	- comprehensive framework for school health audit
Strengths	- an evaluation strategy that is easy to implement at the school level. - part of a larger framework for implementing healthy schools initiatives (this is booklet 7 of 12).
Weaknesses	- does not provide strategies for compiling results. - designed for an Australian context.

10. Title	**KidsMatter: Primary evaluation final report**
Authors, publication date, DOI #/PMID, ISBN	Slee, Lawson, Russell, Askell-Williams, Dix, Owens, Skrzypiec, & Spears, 2009 978-0-9807463-0-3
CSH Pillar(s)	Teaching and Learning, Social and Physical Environment
Learning Domain(s)	Cognitive, Behavioural, Affective
Measure(s) of Student Achievement	Student social and emotional competencies (e.g., positive relationships with others, personal and social problem solving, self-regulation, social awareness), student schoolwork, triangulated parent and teacher rating of students' mental health strengths and difficulties (e.g., emotional symptoms, conduct problems, peer problems, hyperactivity, pro-social behaviour), anxiety and depression, optimism, coping
Methodology	Mixed methods study
Location(s)	Australia
School Level	Elementary schools
Purpose of Evaluation	Examine the impact of KidsMatter (KM) on schools, teachers, parents, and students. KM is an Australian national primary school mental health promotion, prevention, and early intervention initiative.
Sample Population	Teachers, parents of students (target age of 10 years)
Research Instrument(s)	Questionnaires, interview guides for focus groups, reports from KM Project Officers
Method	- quantitative: surveys were distributed to teachers on four different occasions and parents of students on three different occasions for up to 76 students per school (parents and teachers of **n=4,980** students) to collect information on student mental health, engagement with, and implementation of KM, influences on schools, teachers, parents, and students. - qualitative: (a) reports from KM Project Officers who worked with each of the pilot schools; (b) interviews and focus group discussions conducted with school leaders, teachers, parents, and students in 10 schools; (c) summaries of the processes and effects of KM within the schools provided by principals and KM action team leaders.
Key Findings	- schools, teachers, and parents increasingly became engaged with KM, and it was being further implemented by the end of the reporting period. - there were differences in the degree of implementation of KM across schools. - significant improvement in ratings for students' social and emotional competencies. - teachers believed that students who were socially and emotionally competent learn better at school. - 60% of teachers strongly agreed that professional development had increased their commitment to promoting student wellbeing. - improvement in student wellbeing and a decrease in mental health difficulties. - score trajectories of students showed medium to large effect sizes for reductions in mental health difficulties for students in borderline and abnormal ranges, and medium effect sizes for improvements in mental health strengths for students in the abnormal range.
Strengths	- variety of methods used for in-depth look at implementation.
Weaknesses	- small number of classrooms observed. - no direct measurements of student mental health (due to young age).

APPENDIX I: INTERVIEW GUIDE

DATE OF CALL: _____

TIME START:_____

TIME END: _____

NAME OF SPECIALIST: _____

Location (city, province): _____

Organization:_____

Position:_____

Length of time with position: _____

1. (a) Different terms are used in different provinces and territories when we speak of supporting health within schools. Which term is used in your jurisdiction: “Healthy Schools,” “Comprehensive School Health,” “Health Promoting Schools,” “Comprehensive School Community Health,” or other?
   (b) What comes to mind when you hear this particular term?
   (c) What does [term chosen in 1(a)] look like, sound like, and feel like in your jurisdiction?

2. Describe your role and related responsibilities in [term chosen in 1(a)] efforts.

3. When you hear the term “student achievement” what comes to mind?

4. How is/has [term chosen in 1(a)] making/made a difference in student achievement in your province or territory?

5. (a) Have you participated in evaluations that examined the influence of [term chosen in 1(a)] on student achievement? If yes, please tell us about your experience with the evaluation process and share the general findings of the evaluation.
   (b) Are you aware of other evaluations and/or monitoring activities that examine the influences of [term chosen in 1(a)] on student achievement in your province or territory? If yes, could you describe them?

6. (a) As an expert in your field, what have you learned to be accurate indicators and measurements in regards to improving student achievement through improving the health of students?
   (b) Are you aware of other indicators and measurements that add understanding to how [term chosen in 1(a)] might influence student achievement? If yes, could you describe them?