THE EFFECTS OF INCORPORATING IN-SCHOOL GARDENING ON THE MENTAL
WELL-BEING AND SENSE OF BELONGING OF STUDENTS

BY

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THE EFFECTS OF INCORPORATING IN-SCHOOL GARDENING ON THE MENTAL
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FACULTY OF EDUCATION

The undersigned certify that they have read, and recommended to the Senate for acceptance, a MASTER'S THESIS entitled:

The effects of incorporating in-school gardening on the mental well-being and sense of school belonging of students

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ABSTRACT

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This mixed-methods study explored the use of in-school outdoor gardening as a means of addressing the mental health needs of grade 5 students. Students in a grade 5 classroom in a rural Manitoba school participated in outdoor gardening activities for two months of the school year. The study measured the impact of participation in the gardening activities on students’ self-perceived mental well-being and sense of school belonging. Quantitative data was collected using the Strengths and Difficulties Questionnaire and a Mental Wellness Questionnaire and qualitative data was collected by conducting one-on-one interviews with each participant.

The study’s findings demonstrated overall improvement in students’ self-perceived sense of well-being following participation in the gardening activity, with students reporting a reduction in emotional difficulties at the end of the study. There was also an improvement in students’ sense of school belonging through improved peer relationships. In addition, the study reported incidental benefits of participating in the gardening activity which included increased student engagement and sense of ownership over the school garden.
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Author

Paulette Rheault
DEDICATION

I would like to dedicate this thesis to the students with whom I work as a Guidance Counsellor. Your willingness to put your trust in me reminds me of the value of continuing to invest time in my professional learning.
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Chapter One
Introduction and Purpose

The K-12 school system plays a major role in developing people who are contributing members of society. Students spend a large portion of the day at school and are exposed to people and ideas that are meant to help them develop their potential for success in the future. Therefore, schools remain “a unique community setting where the greatest number of children and youth can be accessed and supported” (Joint Consortium for School Health, 2010, pp. 16-17). Students participate in a variety of activities in school with the goal of developing knowledge, skills, and attributes that will help them be successful in their future roles. As Benningfield and Stephan (2015) noted, “Schools are ultimately responsible not just for promoting good readers, writers, and mathematicians but also for producing well-rounded, well-adjusted citizens prepared to live happy, meaningful lives and to contribute successfully to society” (p.xv). This idea is supported by Cohen (2006) who suggests that school goals need to reflect the importance of both academic learning and social and emotional competencies to ensure that students lead successful lives in the future. Therefore, schools have a responsibility to explore the best practices that support students to succeed in fulfilling these goals.

The Problem

In classrooms across Canada, teachers and other school staff work with students to help them attain specific curricular and academic standards. However, teachers are finding increasing challenges in supporting optimum student development. It is not uncommon to work with students who exhibit challenging behaviours or who have emotional difficulties such as anxiety or depression. The Centre for Addiction and Mental Health (n.d.) estimates that 34% of high school students report moderate-to-serious struggles with symptoms of anxiety or depression.
Many studies have found that students dealing with these types of conditions are less likely to demonstrate academic success within the school setting (Durlak, Weissberg, Dymnicki, & Schellinger, 2011; Moilanen, Shaw, & Maxwell, 2010; Suldo, Gormley, DuPaul, & Anderson-Butcher, 2013). In addition, other studies have found that when emotional difficulties are not addressed early on, they often result in larger mental health issues in the future (Moilanen et al., 2010; Obradovic, Burt, & Masten, 2010), indicating that early intervention is a crucial part of dealing with emotional difficulties.

Current practices used to address students’ emotional needs vary widely from school to school. In most Manitoba schools, guidance counsellors are present and are tasked with supporting student learning by implementing a comprehensive guidance and counselling program that includes activities that promote positive social and emotional development (Manitoba Education, Citizenship, and Youth, 2007). The counsellor may provide preventative programming for whole groups as well as individualized supports for students who exhibit moderate or severe emotional difficulties. In addition, some schools are incorporating a social and emotional learning (SEL) curriculum into classrooms as a proactive way of addressing students’ emotional needs at school. Although some schools use gardening as a tool for teaching curricular content, there has been little interest in determining how an outdoor activity such as gardening might address students’ emotional difficulties and promote emotional well-being in students. This study explores the impact of participation in gardening on students’ well-being and sense of school belonging.

**Background to the Study**

The mandate of schools is to facilitate the academic and social development of students. The term, student success, is broadly used to define this mandate. It is important to consider the
characteristics that make up student success at school. The definition of student success can be different depending on whom one asks. It is likely that teachers, parents, and even students themselves would define school success in different ways. Cohen (2006) suggests that government mandates for results-based testing are currently driving schools and teachers to focus primarily on literacy and numeracy skills in students. These are primarily academic skills. Measuring curricular outcomes in traditional academic areas such as reading, writing, and math remains the predominant method for evaluating students in school (Cohen, 2006). However, student success refers to more than academic achievement; it is also connected to high-functioning social and emotional competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision making (Durlak et al., 2011). The Collaborative for Academic, Social and Emotional Learning (Collaborative for Academic, Social and Emotional Learning [CASEL], n.d.) provides a framework that describes these five social and emotional competencies. Many studies support including social and emotional competencies when talking about student success as a whole (for example, Durlak et al., 2011; Lendrum, Humphrey, & Wigelsworth, 2013; Suldo et al., 2014). These skills provide the foundation for resilience and positive mental health in students. Students’ levels of social and emotional competence are directly linked to their ability to be academically successful in school (Benningfield, Potter, & Bostic, 2015). Benningfield et al. (2015) describe how emotion and cognition in the human brain influence each other, such that any emotional stimulus can impact on the academic learning in the classroom. Students who demonstrate emotion regulation skills are more likely to be academically successful (Benningfield et al., 2015; Shanker, 2013). Therefore, the mental health of students is an important component of student success. Given that mental health is “a complex interaction of biological, genetic, economic, social, and
psychological factors” (Carney, 2015, p. 27), its influence on student success can be difficult to understand. However, research suggests that all school staff members have a responsibility to use practices that promote both academic success and psychological well-being (Benningfield et al., 2015; Cohen, 2006).

**Impactors on Student Success**

School staff members are encountering increasing challenges that make it difficult to support optimum student development. In the US, poverty continues to be an increasing reality for children (Clark & Breman, 2009). Jensen (2009) explains that children exposed to poverty exhibit significant risk factors that affect their success at school. For example, emotional and social challenges experienced within the impoverished home frequently result in poor school performance. It is also not uncommon to work with students who demonstrate challenging behaviours in school. The rate of students diagnosed with attention deficit disorders appears to be increasing. Shanker (n.d.) describes an apparent rise in student behavioural problems related to a lack of emotion-regulation. Negative student behaviours affect how teachers work with students and in turn on the academic success of these students. In addition, many students exhibit emotional difficulties such as anxiety or depression. Mood Disorders Canada (2009) indicates that 18% of young adults in Canada are diagnosed with a mental illness. Symptoms of anxiety and depression, in particular, are conditions which seem to be more prevalent in classrooms (Benningfield et al., 2015). Many studies have found that academic success is more likely to be compromised when students are experiencing emotional difficulties (Durlak et al., 2011; Moilanen et al., 2010; Suldo et al., 2013). Cohen (2006) observed that “Social-emotional competencies and well-being are significantly related” (p. 204), and impact how successful
students will be. Consequently, schools must find ways to address mental health related issues faced by students as a way to improve student success.

**Existing Programs**

Schools must address the mental health needs of students since these needs are linked to academic success. A large proportion of programs currently used in schools focus on the implementation of a Social and Emotional Learning (SEL) Curriculum (Durlak et al., 2011; Lendrum et al., 2013; Suldo et al., 2014). This type of SEL programming is considered universal in scope. A universal counselling intervention is one which is provided to a whole group, for example a classroom or a whole school population. This strategy is in line with mental health promotion goals since it focuses on building social and emotional capacity in all students before any significant emotional difficulties emerge. “Primary prevention refers to programming aimed at an entire population or subgroup prior to any problems being exhibited in order to reduce their risk of developing later difficulties” (Clonan, Chafouleas, McDougal & Riley-Tillman, 2004, p.103). SEL curriculum is a strength-based approach that provides students with opportunities to develop skills related to the five social and emotional competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision making. This strategy focuses on a positive school psychology model instead of focusing on deficit-oriented practices (Clonan, et al., 2004). These practices are a proactive approach for supporting students in a holistic manner, addressing student wellness which in turn has positive impacts on academic success.

**Gardening Through the Lens of Social and Emotional Competencies**

Cohen (2006) suggests that “social-emotional competencies and well-being are significantly related” (p. 204). As such, the research that supports using SEL curriculums
provides useful information for schools when seeking to promote mental well-being in students. When one looks at gardening activities through the lens of social and emotional competencies, one can find a number of connections. First, gardening activities can promote positive relationship skills. In a number of studies, students’ interpersonal skills improved when interacting with other students as well as adults during gardening activities (Blair, 2009). Second, gardening can promote student self-awareness and self-management by developing personal qualities such as patience and nurturing. The work required to take care of plants is ongoing and teaches delayed gratification. It is only after many months of work that the gardener gets to indulge in the bounty of the garden. Finally, gardening is an activity that has been shown to improve student engagement at school (Blair, 2009). Engagement and school belonging connects directly to student well-being. Cohen (2006) suggests that engagement is one of the primary factors that impacts on a person’s level of happiness. Consequently, the social and emotional skills developed through gardening activities could positively impact student well-being and overall academic success.

Schools may potentially be able to contribute to student mental well-being by using a universal counselling intervention such as outdoor gardening. Gardening is sometimes referred to as therapeutic horticulture, and shows beneficial results for adults dealing with mental illness (Burton, 2014; Thomas, 2014). Although many schools use gardening as a tool for teaching curricular content, there has been little interest in determining how an outdoor activity such as gardening, might address students’ emotional difficulties and promote emotional wellbeing in students.
Purpose

The purpose of this study was to explore the impact of gardening on students’ perception of their well-being and sense of belonging in school. The following research question was explored:

What is the impact of including outdoor gardening as an intervention in a school counselling program on:

a) the self-perceived well-being of grade 5 students; and
b) the sense of belonging at school of grade 5 students?

Significance of the Study

This study aimed to discover if participation in school gardening activities may positively impact on the mental health of students. The findings have the potential to inform future programming decisions within schools. Hirschi (2015) suggests that the school garden “is arguably the most fundamental example of an environment that simultaneously supports children’s academic education and their healthy development” (p. 5-6). As such, schools that provide students with the opportunity to participate in gardening activities are likely to promote student success. Gardening has the potential to support academic improvements as well as positive mental health, both of which address the larger purpose of education as described by Cohen (2006). This study also helps address the potential issues surrounding the environmental limitations of including outdoor gardening activities at schools located in colder climates, as the findings demonstrate that even short-term participation in gardening may impact positively on students’ well-being.

Methodology

This study explored the use of gardening as an in-school intervention to address student well-being and sense of school belonging in a grade 5 classroom. It used action research since it
involved a small-scale study with practical applications for the researcher. “Action research provides a path of learning from and through one's practice by working through a series of reflective stages that facilitate the development of progressive problem solving” (Riel, 2016). As such, the study sample consisted of a grade 5 classroom with 17 students, within the researcher’s own school environment. The researcher is a counsellor at the school. A mixed method research design was used to collect data at two points in time: before the intervention was introduced and at the end of the intervention. The quantitative phase of research employed the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 2005) and a questionnaire measuring self-perceived wellness of students. The purpose of these two questionnaires was to collect information regarding students’ self-perceived level of well-being and sense of school belonging. The qualitative phase of the study used a set of open-ended questions within the context of an interview to collect more specific information regarding participants’ experiences during the gardening intervention. The intervention itself involved performing gardening tasks (preparing garden, planting, weeding, watering, etc.) on a weekly basis in the outdoor school garden for two months. Students in the chosen class were divided into small groups and worked a specific area of the garden with minimal guidance from adults.

**Definition of Terms**

**Attention Deficit Disorders** – behavioural difficulties that can affect children and manifest as inattentive and/or impulsive behaviours (DSM-5).

**Emotional difficulties** – Difficulty regulating emotions that arise from daily life functions (Shanker, 2013). These difficulties can range in intensity from relatively minor to severe and relate to a person’s level of mental health.
Psychological well-being – describes a person’s well-being in terms of an absence of symptoms of distress as well as a presence of positive emotions. High levels of psychological well-being constitute that a person is thriving. (Howell, Keyes, & Passmore, 2013)

Resilience – the ability to bounce back from adversity, to effectively deal with life challenges.

Social-emotional competencies – a person’s ability to demonstrate self-awareness, self-management, social awareness, relationship skills, and responsible decision making (CASEL, n.d.).

Summary

Chapter One has described the background to the problem, the purpose of the study, the research question that guides the study, the significance of the study, the methodology, limitations, and defined specific terms. Chapter Two explores research that frames the study, including the purpose of schools, what student success looks like, the effects of emotional difficulties on student achievement, behaviour, and engagement, the role of staff, existing programs in schools, and gardening as a tool to address mental health.
Chapter Two

Review of Related Literature

This study explores the implementation of a gardening program within the school curriculum as a proactive intervention to promote student well-being and sense of belonging in school. Schools play a crucial role in the development of young people. Defined broadly, the desired outcomes for all students include three components: academic achievement, social and emotional wellbeing, and successful transition to post-secondary life (UCLA Centre Policy Brief, 2011). To frame the study, the literature review first explores the purpose of schools and the concept of student success followed by a section on how emotional difficulties affect students’ overall performance at school. It also investigates how schools are currently addressing this problem and supporting students with the use of school mental health programs.

The Purpose of Schools

It may be useful to begin this discussion by providing an understanding of the purpose of schools and education in general. The purpose of education has been widely discussed by philosophers and educational pioneers. From Comenius in the late 1500’s to Hutchins in the early 1900’s, the purpose of education has focused on different perspectives that reflect the context of each timeframe (Gutek, 1997). One could argue that schools should prepare students to become contributing members of society, an idea that is difficult to define. Peters (1967) points to the existence of extrinsic and intrinsic aims in education. Extrinsic aims provide students with the necessary skills and knowledge to contribute to the workforce. Students who complete high school and find a job can support their own physical needs. The ability to procure and retain employment likely results in personal economic gains for the student as well as increased productivity for society as a whole. Intrinsic aims are a bit more abstract and focus on
developing students’ individual potential, intellect, and character. Ideally, students leave school having internalized responsible and ethical decision making skills that allow them to interact effectively with others. They also possess a positive sense of self-worth. Both extrinsic and intrinsic goals of education must be met to ensure success for learners at the end of their school years (Cohen, 2006). Cohen argues that school goals need to reflect the importance of both social and emotional competencies and academic learning in order to provide students with the skills necessary to lead successful lives in the future.

**What Student Success Looks Like**

In schools, students may be evaluated on many components such as academic achievement, behavior, and social skills. Their perceived ability to perform in these areas is used by teachers and parents to determine students’ levels of success as learners. In Canada as in many other countries, the measure of students’ success is often tied to academic performance (Manitoba Education, 2011). As such, school districts are evaluated on evidence of student achievement as it relates to curriculum content. However, a growing body of evidence suggests that academic success is also closely related to social and emotional wellness (Benningfield, Potter & Bostic, 2015; Benningfield & Stephan, 2015). As such, measuring student success solely on the basis of academic components doesn’t account for the role of emotional health in learning (Shanker, 2012). Although many ways exist to define school success (Doll, Spies, & Champion, 2012), it can be argued that some common characteristics are associated with success. Durlak, Weissberg, Dymnicki, and Schellinger (2011) describe a number of cognitive, behavioural, and affective skills that determine student competency. These include five core competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision making (CASEL, n.d.). Self-awareness involves having a broad
understanding of one’s self – including emotional awareness and a realistic understanding of one’s personal characteristics. Self-management is the ability to effectively coordinate emotions, thoughts and behaviours in a variety of situations. Social awareness involves being able to empathize with other people regardless of cultural background. Relationship skills provide the foundation for building and maintaining healthy relationships with peers and adults. Finally, responsible decision making allows for one to make productive choices that take into account the well-being of self and others. From a school context, the five core competencies are meant to “provide a foundation for better adjustment and academic performance as reflected in more positive social behaviours and peer relationships, fewer conduct problems, less emotional distress, and improved grades and test scores” (CASEL 2015, n.p.). Students who arrive at school with a higher level of competency in these five areas appear to be more likely to succeed (Ohl, Fox, & Mitchell, 2013). Shanker (2013) also describes success as the ability to self-regulate with respect to five domains, one of which is the emotional domain. As such, students who demonstrate academic difficulties are more likely to exhibit emotional difficulties as well. This is because school success is integrally linked to psychological well-being (Doll et al., 2012). Students’ perceptions of their level of mental health also play a role in their success. Students who report positive mental health have higher academic success and better school engagement (Lyons, Huebner, & Hills, 2013). Lower levels of psychological well-being are linked to observed student distress by teachers and parents (Suldo, Gormley, DuPaul, & Anderson-Butcher, 2013). Therefore, it can be concluded that emotional difficulties may adversely affect students’ success at school.
Effect of Emotional Difficulties on Student Achievement

An estimated 18% of young adults are diagnosed with a mental illness in Canada (Mood Disorders Canada, 2009). Emotional difficulties can be described as difficulty in dealing with emotions that arise from daily life functions. The intensity of emotional distress in students can vary widely and can be the result of many different biological and environmental factors. Students who come to school exhibiting emotional difficulties often find the demands of the school environment challenging. The connection between an individual’s emotional difficulties and their mental well-being is complex and difficult to define. Impacts can range from minor and temporary difficulties due to personal circumstances to diagnosed mental illness conditions requiring formal treatment. One of the more common types of emotional difficulty identified in school-aged children is anxiety, a condition that involves excessive and often unrealistic feelings of worry or fear that interfere with normal functioning (Government of Canada, 2006). Children who experience anxiety may withdraw from peer relationships, be regularly absent from school, or demonstrate compulsive rituals. Anxiety is a condition that significantly interferes with academic and interpersonal functioning at school (Rodgers & Dunsmuir, 2013). The authors suggest that what is even more problematic is the nature of internalizing behaviours relating to emotional difficulties such as anxiety, which makes it difficult to identify who is suffering within a school population. However, increasingly, educational research indicates that emotional difficulties influence students’ academic performance, behavior in the classroom, and ability to effectively interact with peers and adults (Breslau, Breslau, Miller, & Raykov, 2011).

Although the existing research in this area is not overwhelmingly supportive (Pullman, Bruns, Daly, & Sander, 2013), there is evidence that suggests links between emotional health and academic success. Academic performance can be compromised when a student is exhibiting
emotional difficulties at school. Students who struggle with emotional difficulties related to a lack of social-emotional competencies are more likely to struggle with academic difficulties (Durlak et al., 2011). Social-emotional competencies relate to students’ ability to navigate the following competency clusters: self-awareness, self-management, social awareness, relationship skills, and responsible decision making (CASEL, 2015). This appears to be true even when there is no evidence of a formal mental illness (Lyons et al., 2013). Students’ subjective perception of their own well-being influences their academic success; that is to say, low subjective well-being may result in lower grades. Research indicates a linkage between internalization of problems to lower levels of academic competence (Moilanen, Shaw, & Maxwell, 2010). In addition, Suldo et al. (2013) describe how students who display emotional difficulties early on in their school career may struggle significantly later on in the domain of academic competence. Obradovic, Burt, and Masten (2010) suggest that students exhibiting mental health issues are less likely to complete high school due to the cascading effects of mental health problems over developmental periods. Mental health issues that are not addressed become problematic in other areas of a person’s life. This cascade effect has far-reaching implications for future success at the end of secondary education (Obradovic et al., 2010). Research indicates that early indicators of emotional difficulties may lead to academic difficulties later on (Meagher et al., 2009). Importantly, however, studies indicate that addressing student mental health issues and providing supportive programming within the school setting may result in improved academic performance (Daly et al., 2014; Durlak et al., 2011; Mulloy, 2011; Pullman et al., 2013). This evidence suggests potential benefits to providing early intervention to students.
Effect of Emotional Difficulties on Student Behaviour

Students’ emotional difficulties may contribute to the presence of problematic externalized behaviors at school (Moilanen et al., 2010). Students experiencing emotional challenges often demonstrate behaviours such as non-compliance, attention-seeking, and aggression towards adults and peers. Janus and Offord (2007) indicate that up to 25% of students experience behavioural difficulties that impact their school performance. These challenging behaviours also affect other students and staff in a school by causing disruptions in the school environment. There is much anecdotal evidence that suggests that the number of students exhibiting difficulties at school relating to emotional distress is increasing. Many teachers share that they observe several students in their classes with what appears to be emotional difficulties – difficulty dealing with uncomfortable emotions, difficulty interacting with others, low decision making skills - that prevent them from being successful at school and also impact on their behaviour. While students who internalize problems related to mental health do not automatically exhibit behavioural challenges, there is evidence that suggests the two are somehow connected. It has been found that students who initially exhibit disruptive behaviours tend to be identified in schools as in need of mental health supports, suggesting a link (Suldo et al., 2013). Externalizing forms of emotional difficulties often manifest themselves as “bad behavior” within the school environment. Suldo et al. describe how “early difficulties in one domain (typically externalizing forms of psychopathology) have far-reaching and large effects in undermining another domain, such as academic competence” (p.88). Emotional difficulties often lead to academic and behavioural difficulties which may result in problems in other areas such as school engagement.
Effect of Emotional Difficulties on Student Engagement

Finally, emotional difficulties can result in lower student engagement at school, which is often manifested as poor school attendance. While the majority of students in Canada report feeling like they belong at school, a small segment of students does not experience positive belonging at school (Freeman et al., 2011). Challenges early on in students’ academic careers seem to increase the likelihood of other problems developing as they transition into adolescence and even adulthood (Moilanen et al., 2010; Obradovic, et al., 2010). Classi, Milton, Ward, Sarsour, and Johnston (2012) also found that students dealing with emotional difficulties were more likely to experience school absenteeism. In particular, students in Manitoba reported that stress was a leading cause of their school absenteeism (Manitoba Education, Citizenship, and Youth, 2009). Carroll (2012) supported these findings and suggested that poor attendance also influences behavioural and academic outcomes at school. Attendance problems tend to increase over time, resulting in poor outcomes for high school completion and finding employment in the future (Atwood & Croll, 2015). For example, students who exhibit mental health issues are less likely to graduate from high school (Suldo et al., 2013). The presence of mental health issues makes it difficult to deal with the regular challenges of academic demands. Freeman et al. (2011) also reports that students’ sense of connection to school decreases as they get older, impacting emotional well-being. Given that the level of mental wellness of students seems to contribute to the level of their overall success, makes it imperative that schools address mental health issues early on in schools.

Role of School Staff in Supporting Students with Emotional Difficulties

A school’s staff – teachers, administrators, educational assistants – plays an important role in supporting students. These individuals have the potential to make a significant impact on
students due to the amount of daily contact they have with them. As students get older, their school experience may become more influential on their development than their home context (Freeman et al., 2011). Therefore, it is important to consider if and how school staff can support students who are dealing with emotional difficulties. Much of the research suggests that school staff can have a positive influence on students’ mental health (Durlak et al, 2011; Ewing, Monsen, & Kwoka, 2014; Mazzer & Rickwood, 2014; Ohl et al., 2013; Vostanis, 2013). Successful strategies used by staff often involve the use of activities that promote mental health prevention or early intervention (Mazzer & Rickwood, 2014). It is interesting to note that having adequately trained staff in a school can make as significant a positive impact on students’ emotional wellness as the use of clinicians or therapists within a school (Ewing et al., 2014; Ohl et al., 2013). The largest factor that influences a school’s success is adequate training of staff (Lendrum, Humphrey, & Wigelsworth, 2013; Ohl et al., 2013; Vostanis, 2013). In particular, teachers indicate they are better able to help students with emotional difficulties when they perceive they have adequate knowledge of mental health issues and training relating to programs used in schools to address emotional needs of students (Vostanis, 2013). It is also important for teachers to believe their role requires them to provide mental health support to students. Lendrum et al. (2013) emphasize the need for staff “will and skill” (p. 162) for school mental health initiatives to be successful. When teachers believe their work environment requires them to address the emotional needs of their students, they are more likely to employ mental health promotion, prevention, and early intervention strategies (Mazzer & Rickwood, 2014).

Another challenge within school communities is the perceived conflicting roles of teacher and counsellor (Daly et al., 2014). Many teachers perceive that their responsibilities lie mostly in helping students learn academic content, while the school counsellor is responsible for
enhancing students’ social-emotional functioning. This perception may be changing as older teachers retire and are replaced by new teachers with training that reflects the growing understanding about mental health and its impact on student success. However, since academic success is closely linked to a student’s emotional well-being (Doll et al., 2012; Durlak et al., 2011) teachers are likely to be more efficient in addressing academic needs if they also intentionally incorporate strategies that address the emotional needs of their students. The following section identifies programs that are currently being used in schools to address the emotional needs of students.

**Existing School Programs that Address the Needs of Students**

A number of possible levels of mental health interventions exist to support students who are struggling within the context of a school. Programs can be generalized to address overall school populations or selective to support specific students or groups of students who are exhibiting more severe emotional and behavioural problems (Clonan et al., 2004). However, most school programs tend to be universal because these programs allow schools to address mental health issues of all students, including those who are struggling with emotional difficulties without exhibiting externalized symptoms (Lendrum et al., 2013). Another positive consequence of using universal programming is that it reduces stigmatization of students since no one is singled out (Lendrum et al., 2013; Rooney, Hassan, Kane, Roberts, & Nesa, 2013). Of the programs found within the literature, all but one would be described as universal with a prevention and promotion goal (Doll et al., 2012; Durlak et al., 2011; Lendrum et al., 2013; Mulloy, 2011; Rooney, et al., 2013; Suldo et al., 2014). Table 1 outlines the programs this researcher found.
<table>
<thead>
<tr>
<th><strong>Program</strong></th>
<th><strong>Program Characteristics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The Aussie Optimism: Positive Thinking Skills Program (AOP-PTS) Rooney et al. (2013)</td>
<td>Universal, class-based, mental health promotion program linked to classroom curriculum; program teaches cognitive and behavioural strategies with the aim of preventing depressive and anxiety symptoms in students (Components of this program similar to SEL)</td>
</tr>
<tr>
<td>Social and emotional aspects of learning (SEAL) Program Lendrum, Humphrey &amp; Wigelsworth (2013)</td>
<td>Universal intervention incorporated into nine secondary schools and meant to address adolescent mental health issues; the program focused on SEL skills</td>
</tr>
<tr>
<td>School-based resilience processes – a qualitative case study Mulloy (2011)</td>
<td>Case study that examined the school-based protective factors that led to student success within an urban public high school, including a school-wide focus on students’ social and emotional development.</td>
</tr>
<tr>
<td>Expanded school mental health (ESMH) programs Daly et al. (2014)</td>
<td>ESMH services provided to specific students in k – 8 who exhibited behavior issues.</td>
</tr>
<tr>
<td>Expanded School Mental Health (ESMH) Model Ballard, Sander, &amp; Klimes-Dougan (2013)</td>
<td>Program that places Mental Health clinicians on-site in schools; specific intervention to address mental health needs of those students identified with serious mental health issues</td>
</tr>
<tr>
<td>General review of SEL programs Durlak et al. (2011)</td>
<td>213 school-based, universal SEL programs were evaluated; results indicate improved social and emotional skills as well as increased academic achievement.</td>
</tr>
<tr>
<td>Place2Be Lee, Tiley &amp; White (2009)</td>
<td>Program involved individual and group counselling for students identified as in need of additional mental health supports in school, involved play therapy.</td>
</tr>
<tr>
<td>Physical exercise and children’s selfconcept of emotional and behavioural well-being Lamb &amp; Gulliford (2011)</td>
<td>Specific intervention for students who were considered to have low school connectedness or engagement; students participated in physical exercise</td>
</tr>
<tr>
<td>MindfulKids Van de Weijer-Bergsma, Langenberg, Brandsma, Oort, &amp; Bögels (2014)</td>
<td>Universal, class-based program teaches students mindfulness strategies; results showed benefits on mental health of students</td>
</tr>
</tbody>
</table>
Lendrum et al. (2013) describe variable success with Social Emotional Aspects of Learning (SEAL), a universal program implemented in secondary schools that focuses on developing students’ emotional intelligence. Lendrum et al. suggest that more rigorous implementation would likely provide better program results. Suldo et al. (2014) describe successful outcomes for school mental health programs that teach a specific social and emotional learning (SEL) curriculum to all students. This research also describes how SEL curriculums act as a preventative measure for students. Finally, a study evaluating the impact of providing SEL programs to whole-school communities found that the use of evidence-based SEL programming “significantly improved social and emotional skills, attitudes, behavior, and academic performance” (Durlak et al., 2011, p. 405).

The UCLA Centre Policy Brief (2011) provides an intervention framework (Figure 1) which “encompasses efforts to enable academic, social, emotional, and physical development and to address behavior, learning, and emotional problems in the classroom and school wide at every school and in every community” (p.3). This comprehensive approach allows schools to address students’ emotional difficulties using three different strategies: preventative programming that address the needs of school communities as a whole, targeted early intervention, and a strategic focus on individual problems that are chronic and severe. The framework also identifies preventative programming as the primary step within school environments as it tends to be low-cost and may reduce the amount of need for higher cost services required to support students who exhibit moderate and high-end needs. When schools focus on early prevention of emotional difficulties, fewer students are likely to develop severe and chronic mental health problems. Benningfield & Stephen (2015) also indicate the benefits of incorporating such a 3-tiered intervention framework into schools.
When exploring peer-reviewed programs, the predominant program characteristic used to address emotional difficulties of students focuses on building social and emotional competencies through the use of a social-emotional learning (SEL) curriculum (Durlak et al., 2011; Lendrum et al., 2013; Suldo et al., 2014). Durlak et al. (2011) suggest that there is “growing empirical evidence regarding the positive impact of SEL programs” (p. 1) on school success. Main findings of programs reviewed indicated SEL programming for all students improved academic performance (Durlak et al., 2013; Ohl et al., 2013). Some of the evidence also suggested that SEL programs improved social competences in students, allowing them to improve the quality of
relationships they had within the school, and thus promoting psychological well-being (Mulloy, 2011; Obradovic et al., 2010). Although the research looks promising, there is some evidence that suggests continued challenges when using SEL programs to address mental health within schools. In particular, Lendrum et al. (2013) identify implementation issues such as lack of staff training and lower school community support for such programs. Issues also exist at the policy level as funding agencies are increasingly asking for evidence that demonstrates how non-academic programming, such as SEL programs, impact academic outcomes, something that can be challenging to ascertain given the lack of information currently available about which student outcomes are most effectively addressed (Doll et al., 2012; Durlak et al., 2013; Pullman et al., 2013).

In addition, research exists on the impact of improving collaboration between schools and other community mental health service providers. Daly et al. (2014) describe the benefits of integrating mental health programming into educational curriculum so that the two areas of programming can be addressed jointly, eliminating the need to prioritize the importance of one over the other. After all, “there is a positive association between mental health and academic success” (Daly et al., 2014, p. 25). In addition, programs that use mental health clinicians within the school to identify and treat students with mental health issues show improvement in those students’ social and emotional functioning (Ballard, Sander, & Klimes-Dougan, 2013). Improved collaboration between schools and community mental health programs may also reduce the burden of need for adult mental health supports since there is evidence that minor mental health issues identified early on and left unaddressed can lead to more severe mental illness in the future (Steiger, Allemand, Robins & Fend, 2014; Suldo et al., 2014).
**Gardening as a Tool to Address Well-Being**

Recently, there has been more interest in examining how changes in childhood experiences in the last few decades have impacted young people. Shanker (n.d.) suggests that urbanization has created “physical and psychological stresses that test a child who might have coped better in a more rural setting” (p.106). Children now live predominantly in urban settings and spend a large proportion of their time interacting with electronic devices. Many young people also participate in less unstructured time for free play. The consequence of these changes includes less time spend outdoors actively exploring natural settings (Blair, 2009). Gardening is an activity usually done outdoors and it requires interaction with the natural environment. Gardening continues to be investigated by researchers as a way to support positive mental health in people, particularly for those dealing with mental illness. Thomas (2014) states that “it is intuitive to assume therapeutic horticulture would be beneficial to individuals who are metaphorically struggling with the outcomes of poor soil, lack of nurturance, and a lot of ugly weeds choking their fragile growth process” (p.155). Gardening has also successfully been incorporated into many school environments and demonstrates positive, but mostly academic impacts, on students.

To begin, gardening as a therapeutic activity, may support improved mental health for people dealing with emotional conditions such as Post Traumatic Stress Disorder (PTSD). Westlund (2015) found that former soldiers dealing with post-duty mental illness reported improvement in their condition when participating in farming activities. The soldiers indicated that their recovery was connected to their outdoor experiences. Burton (2014) also describes findings that indicate that the use of garden spaces to help support patient recovery from PTSD or other physical ailments. These findings are also supported by Thomas (2014) who describes a
number of studies that demonstrate how therapeutic horticulture has a positive impact on people’s mental health. However, these researchers all point to the need for more rigorous evaluation of gardening interventions.

Within the school setting, research suggests that gardening programs positively impact student academic achievement but it is more difficult to find evidence that supports mental health benefits for students. Blair (2009) provides a review of literature on school gardening outcomes and describes how much of the research focus to date has been on gardening’s impact on student academic success. Most quantitative studies measure outcomes such as science achievement, nutrition knowledge, and change in food behavior. However, Blair also describes a few qualitative studies that demonstrate improvement in social competencies such as motivation, school attitude, and relationship-building with others. Such findings are also supported by Robinson and Zajicek (2005) whose research indicates that students participating in a 1-year school garden program showed improvement in two life-skill components studied: self-understanding and working with groups. These findings support the benefits of incorporating gardening programs within a school environment.

Chapter Two has described some of the existing research that relates to this study, including a description of student success, the effect of emotional difficulties on student achievement, behavior and engagement, the role of school staff, existing programs within the literature, and gardening as a means to address mental health. Chapter 3 describes the methodology used in the study.
Chapter Three

Methodology of the Study

The purpose of this study was to explore the effects of incorporating a universal intervention, outdoor gardening, on students’ perceived mental well-being and sense of belonging, within a grade 5 classroom. Since the literature already provided some support for including outdoor activities such as gardening as part of therapeutic interventions, the hope was that this project would add to the existing body of knowledge and provide a further example of a type of activity that improved the mental health of K-12 students within the context of a school environment.

The Research Design

This particular study used an explanatory sequential mixed methods design. This type of mixed methods design involves quantitative data collection and analysis followed by qualitative data collection and analysis (Creswell, 2012, pp. 542-543). This sequence of events and the resultant triangulation of data allows the researcher to reach more detailed conclusions about the research question based on both types of data.

The study was an action research project that used a mixed method research design which included a survey design in the quantitative phase of the research, followed by an interview design in the qualitative phase. As such, the study employed an explanatory sequential design which allowed for initial quantitative data analysis followed by qualitative data analysis in order to provide a detailed interpretation of the results. The mixed method design provided a way of collecting data specific enough to answer the research question. This type of design was helpful because it used a supplemental method to collect data that would not be obtained by using the main method of data collection (Morse, 2003). In this case, the main method of collecting data
was quantitative surveying; however, the qualitative interview supplemented the quantitative data collected and made it easier to draw conclusions.

**Action Research**

Action research involves trying to solve a specific problem within a specific educational setting (Creswell, 2012, p. 576). More specifically, practical action research involves a small-scale study with practical implications (Creswell, 2012, p. 580). The goal of action research is to find answers to a specific problem in a setting and then implement the findings of the study directly into that same setting. This mixed methods study was an example of action research because the researcher, a school counsellor, was looking at the impact of a strategy (outdoor gardening) to improve practice in supporting students within her grade 5-8 educational setting. The researcher wanted to explore how students’ self-perceived well-being and sense of school belonging were affected by participation in outdoor gardening activities. The study took place in the school where the researcher was already providing counselling services. The findings of the study will inform the researcher’s practice as a counsellor.

**Researcher**

The researcher has worked as a Guidance Counsellor in a Manitoba school for four years. She works with students in Grades 5 – 8 and spends a large portion of her contact time with students delivering programs that target universal populations (whole classrooms) and emphasize primary prevention of mental health issues. The researcher was exploring other programs that might increase her success with supporting all students’ social and emotional needs within her school population. She also hoped to contribute to improving school climate. The researcher was interested in seeing how outdoor gardening could be used as a means of promoting positive student mental health and school belonging in the school population. This action research
project provided the researcher with information to help inform future gardening projects within the school.

**Setting**

The setting for the study was a Grade 5-8 school in a small city in rural Manitoba. The school had a student population of 350 students, with 4 self-contained Grade 5 classrooms of approximately 20 students each. The school was located in a middle-class socio-economic community within the city. The garden area used for the study was located outside in the school yard and was made up of 8 raised garden boxes. Due to the weather constraints of the location, outdoor gardening was only possible during a few school months, namely April to September.

**Participants**

The participants in this study were students in a Grade 5 classroom in the school in which the researcher was currently employed. There were 17 students in the Grade 5 classroom in question and all students were invited to participate. The gardening intervention was meant to target all students within the class, and no one would be excluded. Of those 17 students, only 16 chose to participate. The researcher worked as the Guidance Counsellor in the school in question and had contact with the students in that capacity. The counsellor was in a position of authority as a staff member at the school in question but was not responsible in any way for the evaluation of student academic performance. Since the participants were under the age of majority, the researcher provided parents and guardians with information about the study and provided them with informed consent forms [Appendix B]. She also provided students with consent forms [Appendix B]. While all students in the class participated in the gardening activity, no data was collected from individual students without permission from the parent/guardian and the student.
The population selected for this research study was a relatively normal population of Grade 5 students that functioned well at school and did not exhibit any significant levels of mental health issues, as evidenced by the classroom teacher and by the researcher in her capacity as school counsellor. The Grade 5 students were academically at grade level and had no issues with attendance. Of the 16 students who participated in the study, only two were identified by school staff as requiring regular counselling support throughout the school year. This extra support involved monthly (and at times, weekly) check-ins with the school counsellor, as a means of providing early intervention to address moderate emotional needs.

**Research Instruments**

The researcher used three types of instruments to collect data from participants: two quantitative questionnaires and one qualitative interview. All three instruments were administered twice to all participants: at the beginning of the study, and at the end of the study, following participation in the gardening intervention. The first quantitative questionnaire was a modified version of the well-known instrument developed by Goodman (2005) called the Strengths and Difficulties Questionnaire (self-rated version for 11-17 year olds) [Appendix A]. The questionnaire categories were modified in order to keep separate the results for questions that identified student strengths and the results for questions that identified student difficulties, thereby facilitating analysis of the findings. This questionnaire measured participants’ perceived strengths and difficulties when dealing with social and emotional situations using the following categories of questions: emotional symptoms, conduct (positive and negative), hyperactivity (presence and absence), peer relationships (positive and negative), and prosocial behaviour. Participants were asked to choose from response options in the form of an ordinal scale with three options: not true, somewhat true, or certainly true. The second quantitative questionnaire...
was the Mental Wellness Questionnaire, an instrument adapted from Newth (2004) by the researcher [Appendix A]. The original questions were modified from an adult version to questions that were more appropriate for the age of the participants. This instrument measured participants’ perception of their level of positive experiences at home and school as experienced in the month before filling out the questions and was meant to provide information about students’ self-perceived mental wellbeing and sense of belonging at school. Response options were in the form of an ordinal scale with five options: never, rarely, half the time, frequently, or almost always. The qualitative instrument used was a set of open-ended questions [Appendix A] developed by the researcher to collect additional details about the participants’ perceptions regarding their mental well-being and sense of school belonging. It was meant to supplement the answers provided on the quantitative portion of data collection. The researcher took written notes while conducting one-on-one interviews with each participant. This process can result in data loss due to omission or commission of errors while transcribing participants’ answers (Bernard & Ryan, 2010). The researcher minimized data loss by recording field notes immediately following each interview.

**Procedures**

This action research study has been designed to explore the impact of participation in school gardening activities might impact on students’ self-perceived level of well-being and sense of school belonging. Before commencing the project, approval was sought and granted by the Brandon University Research Ethics Committee. The research procedures fell into three stages: 1) initial data collection using the quantitative and qualitative instruments [Appendix A], 2) participation in the outdoor gardening intervention, and 3) follow-up data collection using the same quantitative and qualitative instruments. This study was deemed to be one of minimal risk
to participants. The probability and magnitude of harm or discomfort anticipated in the research was not greater than any ordinarily encountered in daily life, or during the performance of routine physical or psychological examinations or tests.

To begin, a Grade 5 class was selected from the researcher’s work location and the study was described to the classroom teacher in question. The classroom selected was chosen mostly on the basis of size, in order to accommodate the relatively small garden area in the school yard. A letter of initial contact was provided to the Grade 5 teacher in question outlining pertinent details about the study [Appendix C]. Once permission to use the teacher’s students and school hours has been granted, contact was made with the parents of students in the classroom in question [Appendix C]. Participants and their parent or guardian were asked to read and sign a consent form before beginning the study [Appendix B].

Once participant and parent consent had been collected, participants were asked to fill out two questionnaires – the Strengths and Difficulties Questionnaire [Appendix A] and the Mental Wellness Questionnaire [Appendix A]. Students filled out these questionnaires in the classroom with the researcher present, a process that took approximately 20 minutes. Participants were asked to include their name on the questionnaires for the purpose of linking them with the questionnaires filled out at the end of the gardening intervention. The researcher also conducted a one-on-one interview with each participant using a set of open-ended questions (part 1) [Appendix A]. Individual interviews with each student participant were conducted in the researcher's school office, and this process took approximately 20 minutes. Every effort was made to ensure the comfort and respect of all participants. The researcher made written notes during the interview. All the data collected were stored in a locked cabinet in the researcher’s office that was only accessible by the researcher.
Once data had been collected from all participating students, they were asked to participate in gardening activities in the school garden. Of the 17 students in the class, 16 agreed to participate in the study. The one student who declined to participate was still included in the gardening intervention because that part of the study was considered a school activity. The groups began working in the garden in the first week of May (as early as possible given climatic conditions). The researcher recorded information about each gardening session in a diary [Appendix D]. The 17 students were randomly divided into eight groups; all gardening activities were conducted outside except when the weather prevented it. Each group was given a raised garden box and was asked to make a plan for their garden, which included a list of chosen plants as well as a diagram of how plants were to be arranged in the box (See Appendix E for an example from a group). The researcher provided a list of plants that would likely do well, given the growing season in Manitoba. However, students were encouraged to consider other plants too. Once groups had their plan, students were given the necessary supplies and equipment and were provided with at least one period of 30 minutes per week to work in their garden. The activities performed in the garden were chosen by each group; the researcher was available to answer questions and give limited direction to the groups. In general, most groups performed the following tasks: cleaning out the garden bed and preparing/tilling soil for planting, planting seeds or seedlings, weeding, watering, fertilizing, and tending plants. Each group was given the opportunity to make as many self-directed choices as possible for their gardening experience. In addition to the gardening activities, each group was asked to paint a sign for their garden box as a way to promote group ownership of the garden boxes. The following is an example of Group 1’s procedures:

Week 1

- The group received their handout and general instructions. This group used a system of voting to decide what to grow in the garden. The plants that
received the most votes were chosen to be included in the garden (corn, cucumbers, peas, carrots, and watermelon). When the group drew out their plan (Appendix D), they also included two other types of plants (garlic and potatoes).

- Group named themselves “Triple Trio of Awesomness”
- Began cleaning out designated garden box

**Week 2**

- Continued garden box clean out (pulling weeds, old plants, tilling the soil)
- Planned design for garden sign and began painting

**Week 3**

- More weeding, preparing box
- Planting plants (watermelon) and seeds (corn, cucumbers, peas, carrots)
- Discussed planting potatoes but not in the garden box (takes too much space), no garlic yet
- Watered the garden

**Week 4**

- More weeding and watering

**Week 5**

- More Weeding
- Fertilizing
- Plants are starting to come up through the soil – lots of excitement
- Finish sign and attach to garden box

**Week 6**

- All plants have come up except corn, group chose to replant a few seeds and see what happens
- More weeding
- Labeled rows in the garden

**Week 7**

- Weeding and watering
- Group discussed planting garlic at this stage and decided not to do so, based on researcher’s information (gardening websites suggested best time to plant garlic is in the fall)

**Week 8**

- Built a lattice (two stakes and some twine) for peas to climb
- Weeding
- Fertilizing

**Week 9**

- Weeding, watering

At the end of June, the garden project ended, in conjunction with the end of the school year. Participants were asked once again to fill out the two quantitative questionnaires and to participate in a one-on-one interview with the researcher.

**Data Analysis**

Since the study was a mixed methods design, data analysis occurred in two different ways. The researcher collected quantitative data using two different questionnaires. The data from each questionnaire were treated separately but in a similar fashion. The quantitative data
yielded a specific score for each participant, at two different points in time; before participation in the gardening intervention (April) and following the end of participation in the gardening intervention (June). The ordinal scale used for the questionnaires’ response options allowed the researcher to calculate a score and allowed for the use of statistical analysis. The researcher used software (EXCEL) to calculate descriptive statistics. The data from questionnaires filled out in the initial phase of data collection were compared to the data from questionnaires filled out in the second phase of data collection using a paired t-test. The comparison allowed the researcher to discover if the gardening intervention significantly (p<0.5) impacted on the participants’ self-perceived level of mental well-being and sense of school belonging.

In this study, qualitative data that were collected by way of one-on-one interviews were analyzed to discover repetitions and similarities and differences within the field notes recorded for each participant. Then the researcher used these repetitions and similarities and differences to extract general themes in the data as they related to the research question. This procedure was completed for the initial interview as well as the final interview and the findings were used to supplement the findings generated from the quantitative data analysis.

Chapter Three has outlined the methodology employed for the study and included a description of the research design, research instruments, researcher, setting, participants, procedures, and data analysis. Chapter Four reports the findings of the study.
Chapter Four

Findings

The research question explored in this study was:

What is the impact on

a) self-perceived well-being, and

b) sense of school belonging

of grade 5 students of including outdoor gardening as an intervention in a school counselling program? This chapter reports the findings of the study.

Quantitative Data Findings

The quantitative data collected at the beginning and end of the gardening intervention using the Strengths and Difficulties Questionnaire (SDQ) and the Wellness Questionnaire were compared to determine if any change occurred in the self-reported mental health and sense of belonging of students.

The SDQ Questionnaire

The SDQ tool scored students on a set of self-assessed questions that addressed possible strengths and difficulties that were separated into 5 categories. Emotional difficulties, conduct, and hyperactivity were the categories that contained questions related to the first part of the research question - general mental well-being; while the categories of peer relationships and prosocial behavior addressed the second part of the research question - students’ sense of belonging at school. The SDQ measured students’ answers using a Likert scale with three options: not true=0, somewhat true=1, certainly true=2.
Table 2
*Results for SDQ Questions by Category*

<table>
<thead>
<tr>
<th>Category</th>
<th>Question</th>
<th>April</th>
<th></th>
<th>June</th>
<th></th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emotional symptoms</strong></td>
<td>I get a lot of headaches, stomach aches or sickness.</td>
<td>15 0.80 0.60</td>
<td>16 0.75 0.73</td>
<td>0.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I worry a lot.</td>
<td>16 1.13 0.65</td>
<td>16 0.88 0.38</td>
<td>0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I am often unhappy, depressed or tearful.</td>
<td>15 0.47 0.55</td>
<td>15 0.47 0.41</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I am nervous in new situations. I easily lose confidence.</td>
<td>15 1.07 0.50</td>
<td>16 0.81 0.43</td>
<td>0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I have many fears, I am easily scared.</td>
<td>16 0.94 0.60</td>
<td>16 0.75 0.47</td>
<td>0.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Conduct (-)</strong></td>
<td>I get very angry and often lose my temper.</td>
<td>14 0.71 0.53</td>
<td>16 0.38 0.38</td>
<td>0.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I fight a lot. I can make other people do what I want.</td>
<td>16 0.19 0.16</td>
<td>16 0.13 0.12</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I am often accused of lying or cheating.</td>
<td>15 0.87 0.84</td>
<td>15 1.00 1.00</td>
<td>0.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I take things that are not mine from home, school or elsewhere.</td>
<td>16 0.06 0.06</td>
<td>16 0.06 0.06</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Conduct (+)</strong></td>
<td>I usually do as I am told.</td>
<td>16 1.63 0.25</td>
<td>15 1.60 0.26</td>
<td>0.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hyperactivity (YES)</strong></td>
<td>I am restless, I cannot stay still for long.</td>
<td>16 0.88 0.52</td>
<td>15 0.87 0.55</td>
<td>0.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I am constantly fidgeting or squirming.</td>
<td>15 0.53 0.41</td>
<td>15 0.67 0.52</td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I am easily distracted, I find it difficult to concentrate.</td>
<td>15 0.73 0.64</td>
<td>16 0.69 0.36</td>
<td>0.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hyperactivity (NO)</strong></td>
<td>I think before I do things.</td>
<td>15 1.30 0.38</td>
<td>16 1.19 0.43</td>
<td>0.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I finish the work I’m doing. My attention is good.</td>
<td>15 1.30 0.21</td>
<td>16 1.40 0.38</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Peer-relationships (-)</strong></td>
<td>I would rather be alone than with people of my age.</td>
<td>15 0.47 0.55</td>
<td>16 0.50 0.40</td>
<td>0.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other children or young people pick on me or bully me.</td>
<td>15 0.73 0.64</td>
<td>15 0.47 0.55</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I get along better with adults than with people my own age.</td>
<td>15 0.60 0.40</td>
<td>16 0.88 0.65</td>
<td>0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Peer-relationships (+)</strong></td>
<td>I have one good friend or more.</td>
<td>16 1.80 0.30</td>
<td>15 1.70 0.35</td>
<td>0.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other people my age generally like me.</td>
<td>15 1.30 0.50</td>
<td>16 1.60 0.53</td>
<td>0.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prosocial behaviour</strong></td>
<td>I try to be nice to other people. I care about their feelings.</td>
<td>16 1.69 0.23</td>
<td>16 1.69 0.23</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I usually share with others, for example CD’s, games, food.</td>
<td>16 1.25 0.47</td>
<td>16 1.19 0.30</td>
<td>0.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I am helpful if someone is hurt, upset or feeling ill.</td>
<td>16 1.56 0.26</td>
<td>16 1.63 0.25</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I am kind to younger children.</td>
<td>16 1.88 0.12</td>
<td>15 1.80 0.17</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I often offer to help others (parents, teachers, children).</td>
<td>15 1.33 0.38</td>
<td>16 1.63 0.25</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scale: not true=0; somewhat true=1; certainly true=2
### Table 3
*Overall Means of SDQ Categories*

<table>
<thead>
<tr>
<th>SDQ Category</th>
<th>Mean April</th>
<th>Mean June</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional symptoms</td>
<td>0.88</td>
<td>0.73</td>
<td>0.02*</td>
</tr>
<tr>
<td>Positive conduct</td>
<td>1.63</td>
<td>1.60</td>
<td>n/a</td>
</tr>
<tr>
<td>Negative conduct</td>
<td>0.46</td>
<td>0.39</td>
<td>0.28</td>
</tr>
<tr>
<td>Indicators of hyperactivity</td>
<td>0.71</td>
<td>0.74</td>
<td>0.32</td>
</tr>
<tr>
<td>Indicators of non-hyperactivity</td>
<td>1.30</td>
<td>1.30</td>
<td>0.48</td>
</tr>
<tr>
<td>Positive peer relationship</td>
<td>1.55</td>
<td>1.65</td>
<td>0.35</td>
</tr>
<tr>
<td>Negative peer relationship</td>
<td>0.60</td>
<td>0.62</td>
<td>0.46</td>
</tr>
<tr>
<td>Prosocial behaviour</td>
<td>1.54</td>
<td>1.58</td>
<td>0.27</td>
</tr>
</tbody>
</table>

* = significant at p<0.05
The initial SDQ in April indicated that the group on average displayed few problems in most areas, particularly in the areas of peer relationships, conduct, hyperactivity, and prosocial behaviour. Consequently, any improvements observed from April to June were very small and analysis of t-tests on individual questions indicated no significant changes over the period of the intervention. A description of the overall category findings follows.

**Emotional symptoms.** Emotional symptoms tie in well with the concept of perceived level of mental health. As Shanker (2013) observed, emotion regulation, or the ability to deal with emotional highs and lows throughout the day, has an impact on students’ overall success at school. The link between social-emotional competencies, including effective management of emotions, and well-being has also been reported by Cohen (2006). Students who are experiencing positive mental health will likely score lower on these questions than those students struggling with mental health issues. Notably, students indicated a relatively high level of anxiety in April when answering the question “I worry a lot” (mean=1.125; SD=0.65). The score for this question decreased in June (mean=0.875; SD=0.38), although the difference was not statistically significant. The group of students also indicated a decrease in having difficulties with dealing with new situations over the course of the intervention (April mean=1.07; SD=0.5; June mean=0.81; SD=0.43) but this change was not statistically significant.

When comparing the mean scores overall for the emotional symptom category, the results indicated a statistically significant reduction (p=<0.05) in difficulties from the beginning of the project (mean=0.88; SD=0.58) to the end (mean=0.73; SD=0.48). This result supports past studies (Blair, 2009; Robinson & Zajicek, 2005) that describe gardening as an activity that builds stronger self-awareness in students and improves mental health.
Conduct. Conduct issues within the school context are often described as negative student behaviours and often results in those students displaying such behaviours being identified as in need of mental health supports (Suldo et al., 2013). The findings of the conduct section of the SDQ indicated that the group of students exhibited few conduct problems before the project started and that they followed directions well. As a result, there was no significant change in the category from April to June. For the question “I get very angry and often lose my temper”, the group mean decreased from April (mean=0.71; SD=0.53) to June (mean=0.38; SD= 0.38) but the decrease was not significant (p=0.089). It may be concluded that gardening activities may have contributed to reduced feelings of anger due to the calming, repetitive nature of the tasks as well as the opportunity it gave the participants to dispense energy and perhaps the day’s frustrations.

Hyperactivity. Hyperactivity is a difficulty that is often overlooked when describing mental health issues, but it can affect student success in many ways, including academics and peer relations (Shanker, n.d.; Suldo et al., 2013). The group of students did not initially exhibit difficulties with hyperactivity in April and relatively small, non-significant, changes in mean scores for individual questions in this category were observed over the project duration. The overall mean for the category questions relating to hyperactivity problems increased slightly from April (mean=0.71; SD=0.03) to June (mean=0.74; SD=0.01) while the overall mean for the category questions indicating non-hyperactivity stayed the same from April (mean=1.3; SD=0) to June (mean=1.3; SD=0.2).

Peer relationships. Peer relationships are those connections formed between students that allow them to develop friendships. Students’ ability to develop lasting and meaningful friendships is an important SEL skill that influences success at school (CASEL, n.d.). Three of the five questions in this category on the SDQ addressed negative peer relationships and two
addressed positive peer relationships. Changes were small and not statistically significant. The April results for this category described a group of students who already possessed a high level of peer engagement at the beginning of the project and expressed few difficulties in this area. For the questions describing positive peer relationships (“I have one good friend or more” and “Other people my age generally like me”), student average scores were high (mean=1.55; SD=0.125). The question “Other people my age generally like me” addressed whether students felt accepted by their peer group at school and findings showed that students felt more accepted by others in their peer group from April (mean=1.3; SD=0.5) to June (mean=1.6; SD=0.53), although this difference was not statistically significant. For the questions that described peer difficulties (“I would rather be alone than with people my own age”, “Other children or young people pick on me or bully me” and “I get along better with adults than with people my own age”), student average scores were low (mean=0.6; SD=0.02), again indicating positive peer relationships. The question “Other children or young people pick on me or bully me” indicated a reduction in difficulties from April (mean=0.73; SD=0.64) to June (mean=0.47; SD=0.55). The gardening intervention allowed students in the class to work together and potentially build relationships, resulting in students feeling better liked by the other students. The group work focus of gardening activities was likely an opportunity for students to work together towards a common goal that had a future payoff (vegetables to harvest) and allowed for relationship building. This is an important finding for schools in particular as those environments strive to be places where students feel safe.

**Prosocial behaviour.** Prosocial behaviour can be described as actions that are intended to help others without the expectation of reward. This category of questions was relevant to the research question, given that high levels of prosocial behaviour can impact on students’
relationships with their peers and with adults and influence their success at school (CASEL, n.d.). Students who do nice things for others are more likely to be accepted in a school environment. The overall means for this category indicated that students exhibited a high level of prosocial behaviour at the beginning of the project (mean=1.54; SD=0.29) and so unsurprisingly there was no significant change after the project completion in June (mean=1.59; SD=0.24). The question “I often offer to help others (parents, teachers, children)” showed a small increase from April (mean=1.33; SD=0.38) to June (mean=1.63; SD=0.25) and this may be attributable to the teamwork approach used in the gardening intervention. The fact that students were required to work as a team and help each other with gardening tasks may have lead to an increase in this type of prosocial behaviour.

It is important to note that some questions were left blank on a number of student questionnaires, leading the researcher to wonder why this happened. Some of the possible reasons may have been related to the clarity of some questions, varying reading abilities of students, difficulty in answering using a 3-point likert scale, or lack of comfort with the subject matter of certain questions.

Wellness Questionnaire

Questions in the Wellness questionnaire fell into two categories: well-being and belonging (Table 4). As with the SDQ, this questionnaire revealed that the group of students had a relatively high sense of well-being and school belonging before the project began.
Table 4
Wellness Questionnaire

<table>
<thead>
<tr>
<th>Category</th>
<th>Question</th>
<th>N</th>
<th>April Mean</th>
<th>SD</th>
<th>June Mean</th>
<th>SD</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-being</td>
<td>I was curious and interested in all sorts of things.</td>
<td>16</td>
<td>3.88</td>
<td>1.45</td>
<td>16</td>
<td>4.38</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>I did a good job of listening to my friends.</td>
<td>16</td>
<td>4.06</td>
<td>0.73</td>
<td>16</td>
<td>4.50</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>I was calm and level-headed.</td>
<td>16</td>
<td>3.31</td>
<td>1.43</td>
<td>16</td>
<td>3.69</td>
<td>1.16</td>
</tr>
<tr>
<td></td>
<td>I was able to face difficult situations in a positive way.</td>
<td>15</td>
<td>3.33</td>
<td>0.95</td>
<td>16</td>
<td>3.75</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>I felt healthy and active.</td>
<td>16</td>
<td>3.75</td>
<td>1.67</td>
<td>15</td>
<td>4.67</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>I was able to easily find solutions to my problems.</td>
<td>16</td>
<td>3.31</td>
<td>0.90</td>
<td>16</td>
<td>3.75</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>I lived at a normal pace, not doing everything excessively.</td>
<td>16</td>
<td>3.31</td>
<td>1.03</td>
<td>14</td>
<td>4.36</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>I enjoyed the time I spent at school.</td>
<td>16</td>
<td>3.44</td>
<td>2.13</td>
<td>16</td>
<td>3.75</td>
<td>1.93</td>
</tr>
<tr>
<td></td>
<td>I felt satisfied with what I was able to accomplish at school -</td>
<td>16</td>
<td>3.50</td>
<td>1.73</td>
<td>16</td>
<td>3.94</td>
<td>1.53</td>
</tr>
<tr>
<td></td>
<td>I felt proud of myself.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I had the impression of really enjoying life (at home and school).</td>
<td>15</td>
<td>3.47</td>
<td>2.27</td>
<td>16</td>
<td>3.88</td>
<td>1.05</td>
</tr>
<tr>
<td>Sense of School Belonging</td>
<td>I felt like having fun, participating in sports and all my</td>
<td>16</td>
<td>4.19</td>
<td>0.96</td>
<td>15</td>
<td>4.53</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>I was able to participate in most of the tasks assigned by my teachers</td>
<td>16</td>
<td>4.31</td>
<td>0.63</td>
<td>16</td>
<td>4.50</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>I got along well with everyone around me.</td>
<td>16</td>
<td>3.75</td>
<td>0.87</td>
<td>16</td>
<td>4.00</td>
<td>0.93</td>
</tr>
<tr>
<td></td>
<td>I felt loved and appreciated.</td>
<td>16</td>
<td>3.81</td>
<td>1.23</td>
<td>16</td>
<td>4.00</td>
<td>1.60</td>
</tr>
<tr>
<td></td>
<td>I felt like I fit in and belonged at school.</td>
<td>16</td>
<td>3.56</td>
<td>2.00</td>
<td>16</td>
<td>3.88</td>
<td>1.98</td>
</tr>
</tbody>
</table>

Scale: Never=1; Rarely=2; Half the time=3; Frequently=4; Almost always=5
* = significant at p<0.05; ** = significant at p<0.01
Means for all questions in both categories increased over the period of the project. With regard to individual questions, three questions in the well-being category increased significantly (p < .01). When the data were analysed within the two categories, significant increases were observed from April to June in both categories. Well-being (mean April = 3.50 and mean June = 4.07) showed a significant increase (p < .0001) as did belonging (mean April = 3.92 and mean June = 4.182, p < .01).

**Well-being.** When looking at specific questions, the following questions yielded a statistically significant, positive change (p < 0.05) in the mean from April to June: “I was curious and interested in all sorts of things”, “I felt healthy and active” and “I lived at a normal pace, not doing everything excessively”, demonstrating that the gardening activity potentially impacted student mental health in a positive way. The question “I was curious and interested in all sorts of things”, indicated a significant increase from April (mean=3.88; SD=1.45) to June (mean=4.38; SD=0.92). Students likely felt curious and interested at school because they got the opportunity to participate in a new type of activity (gardening). When asked about the gardening activity at the end of the school year, many students shared that they learned new things and found enjoyment out of working in their garden. The interest and curiosity experienced was also potentially a result of the experiential and self-directed nature of the gardening activities. Students stated that they enjoyed having control of the decisions made in their garden. For the question “I felt satisfied with what I was able to accomplish at school-I felt proud of myself”, the mean score in April was 3.5 (SD=1.73). As predicted, the mean scores for these questions went up after participation in the gardening activity (mean=4.07; SD=0.14), and this change was statistically significant (p=0.00004). This result suggested that the gardening intervention
provided students with feelings of accomplishment and thus may have had a positive effect on the students’ general mental health.

For the question “I felt healthy and active”, the results also indicated a statistically significant change in the scores from April (mean=3.75; SD=1.67) to June (mean=4.67; SD=0.67). Students likely felt more healthy and active due to the gardening because they were given more opportunity to perform physical activities and to spend time outside in the sunshine and fresh air. It is important to note that the change in seasons in Manitoba can be dramatic.

Winters are typically frigid, reaching lows upwards of minus 45C. Summers are warm and generally sunny. Snow melt may begin in March and continue through April. Typically people do not plant less than hardy plants until the end of May. People who have been trapped inside due to cold weather become more active as the days warm up. Thus, the seasonal warming may also have impacted on students’ feelings of being healthy and active. Lastly, students indicated they were living at a more relaxed pace with the question “I lived at a normal pace, not doing everything excessively” from April (mean=3.31; SD=1.03) to June (mean=4.36; SD=0.55). This increase may be attributable to more time spent outdoors in the school garden, instead of in a classroom doing assignments. However, the timing of the gardening intervention also coincided with the end of the school year, a factor that likely influenced students’ sense of a more relaxed daily pace. Students commented that they were happy that June was bringing many special school activities that were enjoyable as well as a marked reduction in the amounts of academic work required.

**School belonging.** A number of questions on the Wellness Questionnaire addressed students’ sense of school belonging and the mean scores in April for these questions were already relatively high (mean=3.92; SD=0.1), suggesting that students in this population had a
good sense of school belonging before starting the gardening intervention. However, the survey indicated an increase in sense of school belonging (June mean=4.2; SD=0.09), suggesting that the gardening potentially helped promote school ties between students in the class. For this category as a whole, the change in mean scores was statistically significant (p=0.001). Students also scored specific questions highly relating to general sense of belonging at school. For the question “I felt like I fit in and belonged at school” the scores improved from April (mean=3.56; SD=2.0) to June (mean=3.88; SD=1.98) although this change was not statistically significant. It is important to note that the results for this question yielded a higher variance, indicating that not every student in the group answered this question positively. Though the group as a whole indicated they had a good sense of belonging, a few students within the group may have been experiencing difficulties in this area.

For the question “I got along well with everyone around me”, the scores in April were fairly high (mean=3.75; SD=0.87) and improved slightly in June (mean=4; SD=0.93). In particular, many students shared with the researcher that working in groups to accomplish the garden tasks had given them an opportunity to build relationships with students they didn’t know as well before the intervention.

In conclusion, while findings from the Strengths and Difficulties questionnaire showed no significant difference pre and post treatment, findings from the Wellness questionnaire indicated that self-reported feelings of belonging and mental wellness of the group of students increased from the beginning to the end of the project, indicating that students felt more positive about their mental health and sense of school belonging after participating in the gardening intervention for May and June of the school year.
Qualitative Data Results

One-on-one interviews were conducted with participants before and after the gardening intervention (see Tables 5 and 6).

At the beginning of the project, most of the students indicated feeling mostly happy with only occasional and temporary feelings of distress such as frustration, anger, or sadness. The majority of the students in the group also described normal life stresses such as school work, friendship conflicts, family stresses related to getting along with family members, chores and responsibilities, or particular family events but could also identify things that were enjoyable, in particular extra-curricular activities and free time outside of school. At the end of the project, students were asked to provide feedback about their gardening experience and the comment most commonly heard was “It was fun”.

Questions Relating to Well-being

When examining the general questions relating to self-perceived mental well-being, the themes that surfaced were similar from April to June.

Enjoyment of activities at home and school. When students were asked about what was going well, they talked about extra-curricular activities such as sports and free time with family and friends outside of school. However, one key difference in the themes occurred in the June results with students talking about enjoyment of school activities for the end of the school year as well as excitement about summer holidays. A few comments shared were: “I am excited for the summer, I feel like there’s nothing on my shoulders”, “There’s less work at school this month”, “I’m looking forward to summer, school’s almost out”. These results indicated that there were potentially other contributing factors (in particular the timing of the gardening
<table>
<thead>
<tr>
<th>Question</th>
<th>Theme</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell me what aspects of your life you have been finding enjoyable in the last month (home, school, extra-curricular activities, friends, etc.).</td>
<td>Enjoying extra-curricular activities 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enjoying school-related activities 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enjoying free time outside of school 5</td>
<td></td>
</tr>
<tr>
<td>Describe how your mood has been during this last month.</td>
<td>Mostly Happy 11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sometimes mad/angry 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sometimes sad 3</td>
<td></td>
</tr>
<tr>
<td>Describe any aspects of your life that you have been finding stressful or difficult to handle in the last month.</td>
<td>School work is stressful 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>School social situations are stressful 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Friendship conflicts 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Family stresses 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extra-curricular activity stress 4</td>
<td></td>
</tr>
</tbody>
</table>
Table 6
Summary of Qualitative Results (June)

<table>
<thead>
<tr>
<th>Question</th>
<th>Theme</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>What aspects of your life have you found enjoyable in the last month?</td>
<td>Extra-curricular activities</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Family activities</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Free time outside of school</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>School activities</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>School is almost over for the year</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Friendship activities</td>
<td>3</td>
</tr>
<tr>
<td>Describe your mood during this last month.</td>
<td>Mostly happy</td>
<td>13</td>
</tr>
<tr>
<td>Describe any aspects of your life that you have been finding stressful or</td>
<td>Nothing has been stressful</td>
<td>5</td>
</tr>
<tr>
<td>difficult to handle in the last month.</td>
<td>School work is stressful</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Family stresses</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Friendship conflicts</td>
<td>2</td>
</tr>
<tr>
<td>Tell me what you thought about your experience spending time in the school</td>
<td>It was fun</td>
<td>15</td>
</tr>
<tr>
<td>garden every week.</td>
<td>I liked being outside</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>It was a break from class</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>We got the choice of what to plant</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>I liked the gardening activities</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>I liked working in a group with other</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>students in my class</td>
<td></td>
</tr>
<tr>
<td>What do you think you learned from this experience?</td>
<td>Not much/I already garden at home</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Learned how to garden</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Team work/getting to know others</td>
<td>7</td>
</tr>
<tr>
<td>What were things you liked about working in the garden?</td>
<td>Being outside</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Planting/gardening activities</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Skipping class</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Choice of what to plant, what to do</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Partner/teamwork</td>
<td>8</td>
</tr>
<tr>
<td>What were things that you didn’t like about working in the garden at</td>
<td>Nothing</td>
<td>8</td>
</tr>
<tr>
<td>school?</td>
<td>Weeding</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Not enough sessions outside to work in the</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>garden</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Getting muddy/wet, mosquitoes</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Challenge working with partners</td>
<td>2</td>
</tr>
<tr>
<td>What emotions or thoughts did you experience while working in the garden?</td>
<td>Happy</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Excited</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Proud</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Negative emotions</td>
<td>2</td>
</tr>
</tbody>
</table>
intervention) that affected students’ self-perceived mental wellness, suggesting the need for further research to determine to what extent the gardening intervention specifically impacted on student mental health.

**General life stresses.** When asked about the stresses in their life, the themes that emerged in April were: stress from school work, friendship conflicts, family stresses (getting along with family members and general responsibilities), and extra-curricular stresses. In June, while the same themes regarding stress were present, a number of students identified feeling little or no stress. This result is likely connected to the timing of the interviews which coincided with the end of the school year. However, the enjoyment expressed by students regarding the gardening activity may also have contributed to the reduction in stress for students.

**Mood was mostly happy.** When looking at the question relating to students’ mood, there were very few differences between the April and June results. The main theme that emerged was that students felt mostly happy with occasional negative feelings such as frustration, anger or sadness. In April, one student stated: “I feel mostly happy; my friends are good, and I have lots of groups to play with. Sometimes I feel a little bit mad at my mom. She doesn’t let me do anything.” In June, another student said: “I feel mostly happy. Sometimes I’m upset because I get picked on by my siblings, but not often.” In short, when asked specific questions about emotional state, students did not perceive any changes from April to June. The results suggest that the gardening intervention may not have had a great impact on students’ general state of mind.

**Gardening Questions**

Themes that emerged were: enjoyment of the gardening activity, enjoyment of teamwork,
choice of gardening activities, gardening made students feel happy, gardening made students feel proud, students disliked “nothing” about the gardening, and non-gardening related responses.

**Enjoyment of the gardening activity.** One of the major themes that emerged from the interviews was a general enjoyment of the gardening activity. All but one student indicated that the gardening intervention was fun for them. Students enjoyed being outside and learning about gardening activities. As one student explained: “I liked doing gardening because you get to go outside and have a bit of a break”.

**Enjoyment of teamwork.** When asked about what they liked about the gardening activity, the most common theme that emerged was the enjoyment and learning that came from working with others. Some of the statements students made included: “I liked getting to know more about my partner; we found lots of thing in common”, “no matter who you’re with, you’ll probably have fun”, “I liked working with someone that isn’t just my best friend. We had fun making the sign”. Some students even indicated that they had to find ways to solve problems within their group during disagreements. One student said: “sometimes it was annoying to have a partner because they did stuff you didn’t want them to do” but also acknowledged that being part of a group gave her “different opinions and decisions” and that had made the experience more enjoyable. This evidence supports the idea that gardening helps develop interpersonal skills.

**Choice of gardening activities.** A number of students also identified the theme of choices in gardening activities as being an important component for enjoying the gardening intervention. Those students felt a sense of independence and responsibility associated with their experience which is related to the SEL trait of self-management. As one student stated, “I liked choosing what to do; it felt like I had lots of responsibility” and another student explained that
“it’s funner to plant when you have your own space and you get to choose your own things to plant”.

**Gardening made students feel happy.** When asked about how participation in the gardening activity made them feel, the majority of students described having positive emotions. The two major themes that emerged from this question were feelings of happiness and excitement. Comments included: “I was happy to be outside”; “I was excited when the carrots came up”; “I was excited about missing class”. The positive feelings came from many sources, not just the gardening activities specifically. One student even commented that participating in the school garden “made me feel like I was part of the school, like I wasn’t left out at all.”

**Gardening made students feel proud.** Gardening can provide opportunities for building a sense of pride and school belonging in students. One comment was, “I liked telling others that I’m growing a garden, makes me feel proud”.

**Negatives about the gardening project.** When asked what they hadn’t liked about the gardening project, about half the group of students said there was nothing they didn’t like. The negative comments students did make about the gardening activity related to more trivial things such as mosquitoes, getting dirty, or sun burns, for example, “It made me upset when I got dirt in my new shoes”.

**Non-gardening related responses.** Students also described general, non-gardening related, reasons for their positive feelings of mental wellness. Many students indicated that they were looking forward to the end of the school year and impending summer holidays. They also described feeling less stress from school work and having more enjoyable activities in the last month of school. These results indicated that there were potentially other contributing factors to the improvement in students’ self-perceived mental wellness, suggesting the need for further
research to determine to what extent the gardening intervention specifically impacted on student mental health.

**Summary of Findings**

In summary, the quantitative findings of this study suggested that students may have experienced some improved mental health and sense of belonging after participating in the gardening intervention. Further research will be required to make more substantive conclusions. The qualitative findings from the student interviews also provided some insight into the positive impact of the gardening intervention, showing that students learned about gardening skills as well as developed interpersonal skills through group work.

Chapter Four has described the findings of the study. Chapter Five discusses the final conclusions as well as recommendations for practice and future research.
Chapter Five

Conclusions and Recommendations

The school system has the difficult task of providing education for all students. Education involves two broad areas of student development – academic skills such as reading and writing and personal development in the form of social and emotional competencies. The overall goal of education is to produce well-rounded citizens who will successfully contribute to society while also enjoying a good quality of life (Benningfield & Stephan, 2015). However, an increasing number of students in schools are demonstrating emotional difficulties such as anxiety and depression or behavioural difficulties that affect their ability to develop effective relationships with others and feel a sense of belonging at school (Freeman et al., 2011). These difficulties are having an impact on academic success (Durlak et al., 2013) and have been found to result in larger mental health issues in the future (Moilanen et al., 2010; Obradovic et al., 2010). While some schools are finding ways of addressing students’ mental health and sense of school belonging using in-class programs that teach SEL competencies, there has been little work done to explore how an activity such as gardening may impact on the mental well-being and sense of belonging of students.

This study explored the use of outdoor school gardening as a universal intervention to address the mental health and sense of school belonging of students in a specific grade 5 classroom. The research question was: What is the impact on a) self-perceived well-being and b) sense of school belonging of grade 5 students of including outdoor gardening as an intervention in a school counselling program?

This study followed an action research design that involved one grade 5 classroom in the school in which the researcher was already working as a Guidance Counsellor. The grade 5 class
was made up of 17 students (of which only 16 students consented to participate in the study) who were considered to be functioning well at school and didn’t appear to exhibit significant levels of mental health issues. The study began in April and finished in June, in conjunction with the end of the school year. The data were collected using a mixed-methods design. Participating students were asked to do the following:

1) In April, students filled out two questionnaires (the SDQ and a Mental Wellness Questionnaire) that related to their self-perceived mental well-being and sense of school belonging. Then they participated in a one-on-one interview with the researcher to provide further details about their sense of mental well-being and school belonging.

2) In May, students were randomly split into small groups and each group was asked to take responsibility of one of the school’s outdoor raised garden boxes and perform gardening activities on a weekly basis. Each group was asked to choose what was to be planted and to make decisions about what tasks needed to be completed when they worked in the garden.

3) At the end of June, students were asked to complete for a second time the two questionnaires (the SDQ and a Mental Wellness Questionnaire) and participated in a one-on-one interview to collect details about their experience with the gardening activity as well as their general sense of mental well-being and school belonging.

**Summary of Findings**

The findings of this study suggested that school gardening did make a positive impact on the mental health and sense of school belonging of the students in the study population. When connecting the findings to SEL characteristics, indications were that students developed SEL skills in the areas of positive relationship skills, as well as responsible decision making and self-awareness. Students identified developing stronger relationships with others in their class and
problem-solving skills during disagreements. Students also described responsible decision-making skills including making choices about their garden and being responsible for its care, as well as expressing pride in their work. They also demonstrated an understanding of self by being able to describe their emotions relating to the gardening experience. In summary, the study provided some evidence that gardening activities help promote positive mental health in students and indicated the need for further exploration of this research question.

**Discussion of the Findings**

The finding of this study contributed to a better understanding of how school gardening activities may impact on students’ well-being and sense of belonging at school. To begin, it is important to describe the characteristics of the group of students who participated in the study. As a whole, the participants in the grade 5 classroom were students who exhibited few difficulties relating to mental health at the beginning of the study. They had good peer relationships and showed a high level of prosocial behaviour, as indicated by the results of the SDQ questionnaire in April. Participants also indicated having little difficulties with hyperactivity and conduct problems. Benningfield & Stephen (2015) suggest that schools should be using a 3-tiered intervention framework that provides appropriate mental health support for all students within a school, even if they do not appear to be suffering mental health issues. The student population in this study fit in the first and broadest category within the intervention framework from the UCLA Centre Policy Brief (2011) (Figure 1) and is most likely to benefit from primary prevention programs. The gardening activity was a good example of one such intervention program since it was universal in scope, allowed the whole class to participate, and addressed a group of students with low needs. The gardening skills learned by the students might contribute to their resilience and potentially help them reduce the risk of having to deal
with mental health issues in the future (Clonan et al., 2004). In addition, the gardening activity could be described as a strength-based approach that emphasized skill-building rather than focusing on deficits. This positive approach to supporting students has been shown to promote student success (Clonan et al., 2004). The intervention framework also indicates that prevention programs would likely be low cost. The gardening activity had minimal costs associated with it since the gardening space was already part of the school yard and the group made use of much of the existing equipment already found in the school. Therefore, gardening appears to be a type of program that could be implemented in schools without too much cost to address the general mental well-being of whole-school populations.

Although the group of students in the study exhibited few difficulties, the findings pointed to a higher level of anxiety in the group. This is in keeping with findings described by Benningfield et al. (2015) who described an increase in students who experience anxiety or depression symptoms at school. After students participated in the gardening activity, they reported a decrease in emotional symptoms, and although this finding was not significant, these results further demonstrate how gardening might positively impact on the mental well-being of participants. This finding is in keeping with Burton (2014) and Thomas (2014) who described how therapeutic horticulture impacted positively on people’s mental health.

The literature relating to gardening at school supports the findings in this study. In particular, students described improved peer relationships after participating in the gardening intervention. This idea is supported by Robinson & Zajicek (2005) whose research demonstrated an improvement in the life-skill “working with groups” when participating in gardening activities. Blair (2009) also described studies that demonstrated improvement in students’ social competencies such as relationship-building with peers and adults. In addition, the qualitative
findings of this researcher’s study also demonstrated that students showed improved competencies relating to self-awareness of emotions as related to the gardening experience. Students were able to describe the positive, and at times negative, emotions they experienced from working in the garden. This improvement in self-understanding was also described by Robinson and Zajicek (2005).

Furthermore, some of the findings from this study connected closely to what has been reported in the literature about the benefits of SEL programs. The findings derived from the qualitative interviews showed that students developed skills related to SEL competencies, in particular relationship-building, self-awareness, and responsible decision making. These improved SEL competencies likely have a positive impact on student success at school, as reported by Durlak et al. (2013). Students also reported an improved sense of school belonging. This effect impacts on the quality of relationships students have within the school, which in turn, positively impacts their mental health (Mulloy, 2011; Obradovic et al., 2010).

An important observation was that the qualitative interviews provided an opportunity for the researcher to collect detailed information from students regarding their personal experience with the gardening activity. The open-ended questions allowed students to share information that was unexpected and yielded a better understanding of how the gardening experience impacted them. As a Guidance Counsellor in the school, the researcher was able to discover many new things about the students in her school through the interview process. This was a secondary benefit observed from the study as it provided an opportunity to work on relationship-building with students and potentially strengthen the students’ sense of belonging at school. Although the quantitative questionnaires also provided some useful data, there was no way to follow-up with students to find out why they had chosen specific answers to questions, providing
less context for understanding how specific answers from students related to their mental well-being. In future studies, the researcher might collect more complete information on specific students by using the “long form” version of the SDQ as it provides an opportunity for respondents to specify what types of difficulties are present and to what extent they are disruptive.

Finally, there were some incidental benefits observed from students’ participation in the gardening activity, in particular the level of engagement the students demonstrated for the garden as well as the sense of ownership and pride they expressed. From the beginning of the gardening project, most of the students in the chosen class were engaged and excited to participate. The gardening activities were not seen as school work, but rather something enjoyable to do. Many students even commented that being in the garden allowed them to “skip class”. Students were learning about gardening, an activity that could be incorporated into several curricular areas as many schools have already done (Blair, 2009). The level of engagement may have been derived from the self-directed nature of the gardening activities. Groups were instructed to make their own decisions about the garden. Consequently, they quickly developed a strong sense of ownership in the activity. When the project was over, students were encouraged to keep visiting and taking care of their garden throughout summer holidays. About half the group gave the researcher an email address so they could keep in touch about the garden and find out when produce was ready to be harvested. Student also expressed pride about the work they were putting in and the results they were seeing. These incidental benefits provide further evidence that gardening might be an activity that contributes to students’ academic and personal success.
Implications and Recommendations for Practice

This study has only begun to scratch the surface of the impact that gardening may have on student mental health. The findings provide further support for the benefits of incorporating gardening activities into schools, particularly as it relates to the dual purpose of education as described by Cohen (2006) as both academic learning and developing social and emotional competencies. Gardening activities can be used as learning opportunities that incorporate curricular content as well as SEL skills. As such, school districts should explore the feasibility of incorporating permanent gardening spaces into schools. There are examples of schools with large greenhouse spaces that are used year-round for student gardening. An exploration of what is already being done by other school districts in Canada and the US would yield a great deal of information which could contribute to the decision-making process. Although the initial cost of implementing garden spaces within schools can be large, subsequent materials and equipment to sustain the garden year after year is relatively small.

The researcher also suggests exploring how community involvement could be incorporated into the school gardening projects. This could happen in the form of shared community spaces for gardening, use of community gardening “experts”, or shared gardening resources and supplies. In addition, further involvement of the classroom teachers in the gardening project would likely make the project more successful. Given that students from this study demonstrated a high level of engagement in the gardening activity, classroom teachers could use the garden to address curricular outcomes with students in a manner that is more enjoyable for students.
Limitations of the Study

There were a number of limitations to the research study. First, the sample used was very small and focused only on one classroom, and one grade level, making it difficult to apply the findings to larger and more varied populations of students. Within the classroom, there were only 17 students and all of them were in grade 5. This made it difficult to produce statistically significant data and made a few outlier results much more impactful than would have been the case for a larger population. In the case of this study, the garden area in the school was also very small, which limited the number of students who could participate in the study. In addition, the group of participants was made up of mostly high-functioning students who were not struggling within the school environment. It is difficult to determine if participation in gardening would similarly impact a group of students who were identified as “at-risk” due to emotional or behavioural difficulties.

Second, weather constraints consistent with Canadian winters made the timing and length of the growing season that coincided with the school months very short (2 months). Warm enough conditions only occurred starting in early May, making the gardening activity last a relatively short amount of time, about 2 months. This timing also prevented students from experiencing a full growing season, preventing them from enjoying the full “fruits of their labour”.

Third, the study occurred at the end of the school year, making it difficult to determine if it was the gardening intervention or other contributing factors relating to the end of the school year that impacted most on the study findings. Students may have noticed improved mental well-being because they were looking forward to summer holidays or enjoying the less academic nature of the last month of school.
**Recommendations for Future Studies**

This researcher believes that there is a need for further studies that focus on the mental health benefits of gardening in schools. Although this study was very small, and thus not generalizable to the broad population, the findings suggest that gardening may potentially provide an experience to students that promotes well-being and positively impacts their academic success as well as helping students develop social and emotional competencies that may help them be more successful. Future studies should explore whether indoor/greenhouse gardening may yield similar benefits to student mental health in order to address the issue of climatic limitations, particularly in Canadian schools. Indoor gardening would allow the growing season to take place for the length of the school year and allow students to participate in gardening activities for the entire length of a growing season. Future studies should also explore the impact of a universal garden intervention that includes all classes within a school for a whole-school approach. This universal strategy would allow all students within a school community to reap the academic and mental health benefits of gardening. In addition, it would be interesting to determine what type of effect gardening activities might have on a population that represented a higher proportion of at-risk students. Finally, future studies should also explore various ways of using gardening across the curriculum to improve academic achievement. There is a great deal of potential for using gardening activities to address curriculum outcomes in many of the subject areas taught in school. For example, teachers could use gardening activities to teach math and science content, as well as vocabulary to second language learners (EAL or French Immersion students).
Conclusion

Over the last few decades, there has been increased understanding of how mental health affects one’s ability to succeed. Within the school system, there is also growing awareness that a small but important number of students struggle with emotional difficulties that impact on their level of school achievement. If schools are to be successful at supporting students’ academic and social-emotional needs, they will need to provide programming that promotes SEL competencies. School gardening is an activity with the potential to positively influence students’ sense of well-being and level of school belonging. Therefore, it is imperative that schools consider incorporating school gardening as part of a strength-based, whole-school approach to promoting positive mental health in students.

My Own Learning

The gardening project has been a rich learning experience for me and will allow me to improve my professional practice. To start, I have learned that students are able to talk about their own level of mental well-being and will do so when given the opportunity to share. They can explain how their personal experiences at school connect to their self-perceived level of mental health. I also learned that it is valuable to ask ALL students about their mental well-being, regardless of the level of perceived difficulties. I learned a great deal from interviewing students who did not appear to be struggling with any issues. The information collected in general student meetings will allow me to provide appropriate counselling supports to address students’ actual needs. Therefore, I plan on experimenting with ways of incorporating general student interviews in my duties as school Guidance Counsellor. In addition, I observed many missed opportunities to integrate curriculum content while working in the garden with students. For future gardening projects, I will look at working cooperatively with classroom teachers to
integrate gardening across the curriculum, thereby addressing academic objectives as well as mental well-being. In particular, the French Immersion program at my school would benefit from using the gardening activities as an authentic language-learning opportunity. I am excited to share with others in my school division about what I have learned while completing my thesis project and look forward to continuing to incorporate gardening activities at school.
References


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Appendix A: Research Instruments

Strengths and Difficulties Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of how things have been for you over the last six months.

Your name: ........................................................................................................... Male/Female

Date of birth: ........................................................................................................

<table>
<thead>
<tr>
<th>Item</th>
<th>Not True</th>
<th>Somewhat True</th>
<th>Certainly True</th>
</tr>
</thead>
<tbody>
<tr>
<td>I try to be nice to other people. I care about their feelings</td>
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<tr>
<td>I am restless, I cannot stay still for long</td>
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<tr>
<td>I get a lot of headaches, stomach-aches or sickness</td>
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<td>I usually share with others, for example CD’s, games, food</td>
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<td>I get very angry and often lose my temper</td>
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<tr>
<td>I would rather be alone than with people of my age</td>
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<tr>
<td>I usually do as I am told</td>
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<td>I worry a lot</td>
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<td></td>
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<tr>
<td>I am helpful if someone is hurt, upset or feeling ill</td>
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<tr>
<td>I am constantly fidgeting or squirming</td>
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<td>I have one good friend or more</td>
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<td>I fight a lot. I can make other people do what I want</td>
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<tr>
<td>I am often unhappy, depressed or fearful</td>
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<tr>
<td>Other people my age generally like me</td>
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<td>I am easily distracted, I find it difficult to concentrate</td>
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<tr>
<td>I am nervous in new situations. I easily lose confidence</td>
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<tr>
<td>I am kind to younger children</td>
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<tr>
<td>I am often accused of lying or cheating</td>
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<tr>
<td>Other children or young people pick on me or bully me</td>
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<tr>
<td>I often offer to help others (parents, teachers, children)</td>
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<td>I think before I do things</td>
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<tr>
<td>I take things that are not mine from home, school or elsewhere</td>
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<tr>
<td>I get along better with adults than with people my own age</td>
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<tr>
<td>I have many fears, I am easily scared</td>
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<tr>
<td>I finish the work I’m doing. My attention is good</td>
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Your Signature: ........................................................................................................

Today’s Date: ........................................................................................................

Thank you very much for your help

©Robert Goodman, 2005
**Mental Wellness Questionnaire**
Read each statement and put a checkmark in the box for the response that best reflects how you have been feeling during the past month.

<table>
<thead>
<tr>
<th></th>
<th>Never 1</th>
<th>Rarely 2</th>
<th>Half the time 3</th>
<th>Frequently 4</th>
<th>Almost always 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I got along well with everyone around me.</td>
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<tr>
<td>2.</td>
<td>I felt loved and appreciated.</td>
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<tr>
<td>3.</td>
<td>I was curious and interested in all sorts of things.</td>
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<td>4.</td>
<td>I did a good job of listening to my friends.</td>
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<tr>
<td>5.</td>
<td>I was calm and level-headed.</td>
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<td>6.</td>
<td>I was able to face difficult situations in a positive way.</td>
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<tr>
<td>7.</td>
<td>I felt healthy and active.</td>
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<tr>
<td>8.</td>
<td>I felt like having fun, participating in sports and all my favourite hobbies.</td>
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<tr>
<td>9.</td>
<td>I was able to easily find solutions to my problems.</td>
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<tr>
<td>10.</td>
<td>I lived at a normal pace, not doing everything excessively.</td>
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<tr>
<td>11.</td>
<td>I enjoyed the time I spent at school.</td>
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<tr>
<td>12.</td>
<td>I was able to participate in most of the tasks assigned by my teachers at school.</td>
<td></td>
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<tr>
<td>13.</td>
<td>I felt satisfied with what I was able to accomplish at school – I felt proud of myself.</td>
<td></td>
<td></td>
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<tr>
<td>15.</td>
<td>I had the impression of really enjoying life (at home and school).</td>
<td></td>
<td></td>
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</table>

(Adapted from S. Newth, 2004)
Open-Ended Questions (Part 1)
1) Please tell me what aspects of your life you have been finding enjoyable in the last month (home, school, extra-curricular activities, friends, etc.).

2) Describe how your mood has been during this last month?

3) Describe any aspects of your life that you have been finding stressful or difficult to handle in the last month.

Open-Ended Questions (Part 2)
1) Tell me what you thought about your experience spending time in the school garden every week.

2) What do you think you learned from this experience?

3) What were things that you liked about working in the garden at school?

4) What were things that you didn’t like about working in the garden at school?

5) What emotions or thoughts did you experience while working in the garden?

6) Please tell me what aspects of your life you have been finding enjoyable in the last month (home, school, extra-curricular activities, friends, etc.).

7) Describe how your mood has been during this last month?

8) Describe any aspects of your life that you have been finding stressful or difficult to handle in the last month.

(Rheault, 2016)
Appendix B: Informed Consent Forms

Informed Consent (Parent and/or Guardian)

Research Project Title: The effects of using outdoor gardening as a therapeutic intervention

Investigator:
Paulette Rheault
(204) 857-3405
Graduate Studies in Education, Brandon University

Introduction
The following document is meant to provide you with information about a study which will be conducted by Mme Rheault, the Guidance Counsellor at Ecole Arthur Meighen School. Mme Rheault is conducting this study in conjunction with Brandon University, where she is completing a Master’s Thesis in Counselling. The students in your child’s Grade 5 class will all be invited to participate in this research study. As such, the researcher, Mme Rheault, will be asking for consent from all the students in Mme Guimond-Low’s Grade 5 class who choose to participate, as well as their parents/guardians. Participation in this research study is completely voluntary. Please feel free to contact Mme Rheault if you still have questions after reading the following information.

Purpose of the Research:
The purpose of this study is to determine how participating in outdoor gardening activities impacts on students’ perceived mental wellness. Recently, there has been more focus on the importance of mental health in youth. Researchers are documenting a link between students’ emotional wellness and its impacts on success at school. Outdoor gardening may be a strategy that influences students’ sense of wellbeing and belonging at school. This study will measure participating students’ self-perceived wellness and sense of school belonging after participating in outdoor gardening activities.

Description of the Research:
Students in Mme Guimond-Low’s Grade 5 classroom will be invited to participate in this study. As such, the study is described as universal in scope, that is to say, all students in the class will be invited to participate.

The proposed research will take place as such:
1) The study will begin in April and be completed by the end of the school year in June.
2) Each student will be asked to fill out two questionnaires at the beginning of the study. The first questionnaire is the “Strength and Difficulties Questionnaire” which is a measure of how the student perceives his/her strengths and difficulties are when dealing with social and emotional situations. The second questionnaire is the “Wellness Level” questionnaire, a set of questions that ask the student to determine his/her own perception related to level of mental wellness. These questionnaires will be administered in the classroom and will take approximately 20 minutes to complete. They will be collected by the researcher and stored in a confidential location. Students have a choice of not answering any question or withdrawing from the study at any time. Every effort will be
made to keep student identities confidential and student identities will be concealed when
the research data is reported within the researcher’s work.

3) Each student will be interviewed individually by the researcher with a pre-determined set
   of open-ended questions. The interview will take approximately 15 minutes to complete.
   Student answers will be documented using written notes taken by the researcher and
   stored in a confidential location.

4) Students will participate in gardening activities in the outdoor garden space found in the
   schoolyard. Activities will include cleaning up garden beds, planting seeds and seedlings,
   watering, weeding, and other gardening activities as necessary. These activities will take
   place at least once per week for a 40 minute period at a time. Students will be separated
   into small groups and work together to take care of a specific area of the garden. These
   activities will take place from April to June (depending on the weather).

5) At the end of June, students will once again be asked to fill out the two questionnaires (as
   per step 1 and 2) and will be interviewed by the researcher (as per step 3).

6) If any changes are made to the study or new information becomes available, you will be
   informed.

7) After the study is complete, all the research data that has been collected from students
   will be destroyed.

Access to Research Information:
The researcher will be the main person who will have access to the data collected for this study.
However, because this study is connected to the researcher’s completion of a Master’s Thesis,
the researcher’s academic advisor may also have access to the data. The data collected from
students will be retained until the study is completed by approximately December 2016.
Participants in this study will not be informed of the results of the research. However, the
completed research document will be available to participants and their guardians if requested.
The researcher will meet and share study findings with any of the participants and/or their
parent(s)/guardian(s).

Participation is Voluntary:
Your child’s participation in this study is completely voluntary and will not affect any school
activities of evaluations. You may refuse your child’s participation in the study at any time. Your
child may also refuse to participate or may withdraw from the study at any time. If the
participant withdraws, he/she can request to remove his/her data from the collection undertaken.
The student participants will only be asked to share what they feel comfortable sharing with the
researcher and are under no obligation to answer all questions.

Potential Harm or Inconvenience:
There is no known harm associated with your child participating in this study. However, by
consenting to participate, participants have not waived any rights to legal recourse in the event of
research-related harm.

Potential Benefits:
The potential benefits of your child participating in this study are that they may gain an understanding of the skills involved in outdoor gardening. He/she may also experience improved feelings of mental wellbeing.

**Confidentiality:**
Confidentiality will be respected and no information that discloses the identity of your child will be released or published without your consent unless required by law. If, during the course of any study activities, your child shares information relating to their personal safety (eg. disclosure of abuse), it is a legal requirement for the researcher to report the incident to the authorities.

**Certificate of Consent:**
By signing this form, I agree that:

- The study has been explained to me and my child.  
  Yes □ No □

- All our questions were answered.  
  Yes □ No □

- The possible harms and discomforts and the possible benefit of this study have been explained to me and my child.  
  Yes □ No □

- I understand that I have the right not to have my child participate and the right to stop his/her participation at any time.  
  Yes □ No □

- I understand that I may refuse to have my child participate without consequence.  
  Yes □ No □

- I have a choice of having my child not answer specific questions.  
  Yes □ No □

- I and my child are free now, and in the future, to ask any questions about the study.  
  Yes □ No □

- I have been told that my child’s personal records will be kept confidential.  
  Yes □ No □

- I understand that no information that would identify my child will be released or printed without asking me first.  
  Yes □ No □

- I understand that I and my child will receive a signed copy of the consent form.  
  Yes □ No □

I hereby consent to have my child participate in this study:

__________________________________________  ____________________

(Parent/guardian signature)  (Date)

Name of child: _______________________________________

Name of person who obtained consent:

__________________________________________

__________________________________________

(Researcher’s signature)  (Date)
Informed Consent (Student Participant)

This informed consent form is for students in Mme Guimond-Low’s Grade 5 class who are being invited to participate in the following research study. This study will be conducted by Mme Rheault, the Guidance Counsellor at the school, and is part of a Master’s Thesis which Mme Rheault is completing at Brandon University.

Research Project Title: The effects of using outdoor gardening as a therapeutic intervention

Investigator:
Paulette Rheault
(204) 857-3405
Graduate Studies in Education, Brandon University

This Informed Consent Form has two parts:
- Information Sheet (information about the study)
- Certificate of Assent (this is where you sign if you agree to participate)

You will be given a copy of the full Informed Consent Form.

Introduction
I am Mme Rheault, the Guidance Counsellor at Ecole Arthur Meighen School. I am also a student at Brandon University and am working on finishing a Master’s Thesis in Counselling. I need to complete a research study and the study I have chosen to work on involves exploring how gardening activities might impact on the mental well-being of students in a Grade 5 classroom.

I am going to give you information and invite you to be part of this research study. You can choose whether or not you want to participate. I have discussed this research with your parent(s)/guardian(s) and they know that I am also asking for your agreement. If you are going to participate in the study, your parent(s)/guardian(s) also have to agree. But if you do not wish to take part in the study, you do not have to. You may discuss anything in this form with your parents or friends and you do not have to decide to participate immediately. If there are words you don’t understand or things you want me to explain, please ask me to stop at anytime and I will take time to explain.

Purpose of the Research:
The researcher, Mme Rheault, is interested in exploring how student participation in outdoor gardening activities impacts on students’ self-perception of their mental well-being and their sense of school belonging. Students who participate in the study will be asked to share information about how they feel things are going for them at home and school. They will also be asked to participate in outdoor gardening activities at school. Mme Rheault wants to find out if adding gardening activities to your school day will make you feel better about yourself and the situations you experience at school and home. She will use this information to improve how student mental health is supported at Ecole Arthur Meighen School.

Description of the Study:
All students in Mme Guimond-Low’s Grade 5 classroom will be invited to participate in this study. You have the choice to participate and there will be no consequences if you choose not to participate. Students who choose to participate in this study will be asked to do the following:

1) Each participant will fill out two questionnaires about how they feel they are dealing with situations at home and school. The questionnaires are: the Strength and Difficulties Questionnaire” and the “Mental Wellness Questionnaire”. This process will happen in the classroom and will take about 20 minutes. You may choose not to answer any question on these questionnaires.

2) Each participant will be interviewed by Mme Rheault, using a set of questions that will allow them to share more about how they feel they are dealing with situations at home and school. Their answers are completely voluntary and students will only be asked to share that with which they feel comfortable sharing with Mme Rheault. They may choose not to answer any question.

3) Students will participate in gardening activities in the outdoor garden space found in the schoolyard. Activities will include cleaning up garden beds, planting seeds and seedlings, watering, weeding, and other gardening activities as necessary. These activities will take place at least once per week for a 40 minute period at a time. Students will be separated into small groups and work together to take care of a specific area of the garden. These activities will take place from April to June (depending on the weather).

4) At the end of June, students will once again be asked to fill out the two questionnaires (as per step 1) and will be interviewed by Mme Rheault (as per step 2).

5) After the study is complete, all the research data that has been collected from students will be shredded.

**Participation is voluntary**

You don’t have to participate in this study if you don’t want to. If you decide not to be in the study, it’s okay and nothing changes. Even if you say “yes” now, you can change your mind later and it’s still okay.

**Risks or Discomforts:**

None of the activities you participate in for this study will be dangerous or harmful. The activities you participate in for this study are similar to other activities you already do at school with your teachers and with Mme Rheault.

**Potential Benefits:**

The potential benefits of participating in this study are that you might learn a new skill (gardening). You might also find that spending time in the garden helps you feel better about yourself and how you are coping with things that go on at school and home.

**Confidentiality:**

Confidentiality means keeping any information you share with Mme Rheault private. Information collected by Mme Rheault will be put away and no one but Mme Rheault will be able to see it. It will be stored in a locked cabinet in Mme Rheault’s office at school. You will put your name on your questionnaires for the purpose of connecting your answers before and
after the gardening activities. Mme Rheault will conceal your name when reporting the information for her study so that no one will know that you took part in the study. If, during the course of any study activities, you share information relating to your personal safety (e.g. disclosure of abuse), it is a legal requirement for Mme Rheault to report the incident to the appropriate authorities. After the research study is over, all of the information you shared will be destroyed using a shredder.

**Sharing the Findings:**  
When the study is finished, Mme Rheault will be able to share the results that were found with you if you are interested. You will be invited to meet with Mme Rheault at school in her office, where she will be able to go over the findings with you, and your parents if they are interested. The findings will also be part of Mme Rheault’s Thesis Report, which will be available in the Brandon University library.

**Certificate of Consent:**

I understand the research involves participating in gardening activities as part of the regular school day. I understand that I will be asked to fill out questionnaires and that I will be interviewed twice by the researcher in order to collect data about how I feel about how I am dealing with situations at home and school.

I have read this information and have had my questions answered. I know I can ask questions later if I have them.

I agree to take part in the research study.

**OR**

I do not wish to take part in the research and I have not signed the consent below.______  
(Initialed by child)

**Only if child consents:**

Name of child (Print): ________________________________
Signature of child: ________________________________
Date: ________________________________
Appendix C: Letters of Initial Contact

February 1, 2016

Dear Parents / Guardians,

I am the Guidance Counsellor at École Arthur Meighen School. I am currently completing a Masters in Educational Counselling at Brandon University. As such, I am working on my final thesis project which has the goal of exploring the effects of using gardening as a therapeutic intervention for students in Grade 5. I am interested in seeing if participating in outdoor gardening activities has an effect on students’ own perception of their mental wellbeing sense of belonging at school.

I would like to invite your child to participate in this gardening project. His or her participation would involve working in the school garden for about one 40 minute school period a week, starting in April 2016 and ending in June 2016. He or she would also be asked to fill out a set of questionnaires, two times during the course of the project and to meet with me to answer open-ended questions about his or her experience with the gardening activity. The data collected through these methods would remain confidential and your child would not be identified in any of the reported findings. Your child’s participation in this project is voluntary and you may choose to withdraw your child from the project at any point in time without prejudice. Your child’s teacher is aware of this project and will provide class time for completing all activities.

Please take a few minutes to look over the attached consent form. If you choose to allow your child to participate in this study, you will be required to sign two copies of the informed consent form. Your child will also be required to sign a copy of the consent form. You may contact me at the school at (204) 857-3405 if you have any questions or concerns about this activity.

Thank you for your time and consideration,

Paulette Rheault, Guidance Counsellor
École Arthur Meighen School
February 1, 2016

Dear Mme Guimond-Low,

I am currently working on a Master’s Thesis for Brandon University. My study has the goal of exploring the effects of using outdoor gardening activities on the perceived mental wellness of students in a Grade 5 classroom. As such, I am writing to ask if you would permit me to work with your Grade 5 students to conduct my study.

The study will take place from April to June of 2016. Students that choose to participate will be required to fill out two surveys and conduct an interview with me. This data collection will take place during class time but shouldn’t take more than 35 minutes per student. In addition, the students will be required to participate in gardening activities on a weekly basis, for about one class period at a time. Your decision to allow me to use your class for this study is completely voluntary.

Please let me know if you have any questions about this request. I can be reached at school at 204-857-3405 during the school day. I thank you in advance for your consideration.

Paulette Rheault
Guidance Counsellor
École Arthur Meighen School
Appendix D: Gardening Diary

Diary – Gardening Activities

Groups – Randomly Selected

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3 students)</td>
<td>(2 students)</td>
<td>(2 Students)</td>
</tr>
<tr>
<td>Group 4</td>
<td>Group 5</td>
<td>Group 6</td>
</tr>
<tr>
<td>(2 Students)</td>
<td>(2 Students)</td>
<td>(2 students)</td>
</tr>
<tr>
<td>Group 7</td>
<td>Group 8</td>
<td></td>
</tr>
<tr>
<td>(2 Students)</td>
<td>(2 students)</td>
<td></td>
</tr>
</tbody>
</table>

May 4, 2016 (Period 8)

- 30 minutes in the garden
- Organizing groups – chosen randomly
- Researcher provided a handout (Appendix 4) and lead a discussion relating to types of plants that grow well in the climate area and how garden plots might be organized (eg. provide space for plants, individual plants vs. rows, etc.)
- Each group planned what to grow and how to arrange the plants in their box. They were eager to start weeding and cleaning out their boxes too. (Example of group plan attached, Appendix 4)
- Lots of excitement, kids looked really engaged
- Ownership – “is this our garden, is it just for us?”, “are we going to be able to use the stuff we grow and take it home?”

May 12 (Period 8)

- 40 minutes
- Painting group signs; groups chose to create a slogan for their group, some added their names, decorated
- continue garden plot clean-up
- Group work seems to be going smoothly – group members cooperating and taking turns

May 20 (period 1 and 3)

- One hour
- Groups spent time weeding and planting their gardens
- Students chose where to plant/how to organize rows and plants
- Researcher provided guidance to groups regarding how much space would be needed for different plants based on growing habits (eg. cucumbers trail on the ground, tomato plants grow quite large and bushy)
May 24 (period 3)
- 30 minutes
- Finish planting/watering gardens
- Group 7 found a tomato plant cut off at the stem – we talked about what might be going on. Some of the students suggested it was cut worms and that we should try to put egg shells around the tomato plant (as per previous gardening experience at home). We have decided to do this after we replant another tomato plant.

May 25 (period 4)
- Replant tomato plant for group 7, add egg shells around all tomato plants.

May 27 (period 7 and 8)
- Finish painting signs (weather did not permit going outside today)

Week of May 30 – June 3
- Students have been reporting checking out their gardens during recess and sharing with me what they see coming up. There is excitement about carrots and peas popping through the ground.

June 2 (period 3 and 4)
- Group 7 found their tomato plant sniped off at the stem again. They seemed frustrated so we talked about what our plan B might be for that area of the garden. They decided not to try again with a tomato plant and decided to add more flowers to their box. I will bring more flowers for them to add next week.
- Fertilizing gardens – a student commented that she gardened at home but had never used fertilizer in it before. She wondered about the difference it would make to this garden.
- More weeding and adding labels for the different plants
- I am noticing groups helping each other with their weeding
- There is much excitement from students as they watch what is coming up in the gardens.
- One student commented about being surprised that some of the seeds haven’t sprouted (3 cucumber seeds planted, only one germinated).

June 10
- Groups that had planted peas created lattices to allow for climbing
- More weeding, watering, fertilizing as each group saw fit for their garden box. Groups with tomato plants also added tomato cages around their plants. Tomato plants are already getting pretty big, this would be better to do as soon as tomato plants go in the ground.
- Group 7 has replaced area that had tomato plant with more flowers instead (bedding flowers purchased at greenhouse by researcher)
June 17

- More weeding, watering, fertilizing as each group saw fit for their garden box
- Some boxes are definitely weedier than others, but group members seem to be working together to get the weeding done.
- Many students commented that they weren’t expecting the plants to get as big as they are.
Appendix E: Gardening Worksheet Example

**Vocabulaire – le jardin**

<table>
<thead>
<tr>
<th>Légumes:</th>
<th>Fruits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Le concombre ✓</td>
<td>Le melon cantaloupe</td>
</tr>
<tr>
<td>La tomate ✓</td>
<td>Le melon d'eau</td>
</tr>
<tr>
<td>L'oignon ✓</td>
<td>Herbes:</td>
</tr>
<tr>
<td>Le piment ✓</td>
<td>Le basilic</td>
</tr>
<tr>
<td>Le piment ✓</td>
<td>L'origan</td>
</tr>
<tr>
<td>Le piment jalopeno ✓</td>
<td>L'aneth</td>
</tr>
<tr>
<td>Le maïs ✓</td>
<td>Le thym</td>
</tr>
<tr>
<td>Le pois / pois mange-tout ✓</td>
<td></td>
</tr>
<tr>
<td>La carotte ✓</td>
<td></td>
</tr>
<tr>
<td>La pomme de terre ✓</td>
<td></td>
</tr>
<tr>
<td>Le chou ✓</td>
<td></td>
</tr>
<tr>
<td>La citrouille ✓</td>
<td></td>
</tr>
</tbody>
</table>

**L'équipement:**
- L’arrosoir
- La pelle
- Le râteau
- La houe
- La graine

**Les tâches:**
- Cultiver la terre
- Planter/semer le jardin
- Déségerber (enlever les mauvais-herbes)
- Arroser le jardin

---

**Plan**

[Diagram of a garden plot with labeled crops]

- Corn
- Cucumbers
- Peas
- Carrots
- Potatoes
- Watermelon