Student Perceptions of Participating in a Mindfulness-Based Program in School: A Photovoice-Informed Case Study

by

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

Master of Science

in

General Public Health

School of Public Health
University of Alberta

ABSTRACT

Wellbeing in school-aged children is a systemic and growing public health concern throughout Canada and abroad. School-based health promotion initiatives which utilize a Comprehensive School Health (CSH) approach are one way to address this problem. Research using a CSH approach continues to grow, including research demonstrating the utility of mindfulness-based initiatives in schools for promoting student wellbeing. What is lacking from this body of research are student voices. Therefore, this study explored students' perceptions of their experiences and impacts of participating in a mindfulness-based initiative, the HeartMath Pilot Program, in the classroom. A qualitative case study utilizing a photovoice-informed method was conducted to gain an understanding of students' perceptions. Participants included 46 grade five students at a public elementary school in a mid-sized city in Canada. Our findings indicated that students perceived the impact to mainly be the experience of calm, primarily elicited by mindful breathing, and facilitated by practicing in a quiet space, with friends, and/or with a designated teddy bear. The students perceived practicing mindfulness-based skills aided them in reducing stress, facilitating pro-social skills, and in falling asleep. By providing an avenue for grade five students to share their experiences and perceptions in their own words, our findings can inform contextual implementation considerations for future research and practice of mindfulness-based initiatives with students in school-based settings.

PREFACE

This Master's thesis is original work produced by Lisa Armstrong. No part of this thesis has been previously published. The research project included in this thesis received research ethics approval from the University of Alberta Human Research Ethics Board, under the Project Name "Student Perceptions of the Social-Emotional Wellbeing and Mental Health Impacts of Practicing HeartMath: A Photovoice Informed Case Study.," No. Pro00096663. The original ethics approval was obtained on February 3, 2020, was amended on April 16, 2020 for completing data collection online due to COVID-19 protocols, and expired January 19, 2022. Approval to conduct this study with students in a Red Deer Public School was also received by the Red Deer Public School District Board.

ACKNOWLEDGEMENTS

I want to deeply thank my supervisor, Dr. Kate Storey, for your continued support and skilled direction over the last few years. It has been a privilege to learn from you. I would also like to thank my committee member and former supervisor Dr. Jane Springett for taking the time to contribute your knowledge, wisdom, and guidance during this journey. Thanks also to Dr. Anomi Bearden and Dr. Stephen Brown of Red Deer College (now Red Deer Polytechnic) for supporting connections with the school and the HeartMath methods. I want to thank the participation of the Red Deer Public School District and specifically the educators Mr. Colin Christensen and Ms. Krista McLean as they were instrumental in the methods and data generation of this research. In addition, I would like to thank my friends and family for bearing with me and encouraging me in my academic endeavors.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS

AHS: Alberta Health Services

CES: Community-Engaged Scholarship

CLW: Community Liaison Worker

CSH: Comprehensive School Health

FCSS: Family and Community Support Services

HMI: The Heart Math Institute

HRV: Heart Rate Variability

JCSH: Joint Consortium for School Health

MBI: Mindfulness-Based Interventions

PR: Participatory Research

SEL: Social Emotional Learning

RA: Research Assistant

RSA: Respiratory Sinus Arrhythmia

WHO: World Health Organization

CHAPTER 1: INTRODUCTION

1.1 Overview

In this introduction, I will purport the thesis purpose and outline. Chapter one will demonstrate the social emotional wellbeing and mental health (succinctly termed wellbeing throughout) status in Canadian children and youth along with the effects wellbeing has on children's overall health, positive development, and academic success. Furthermore, this introduction will illustrate that Comprehensive School Health (CSH) is an advisable health promotion framework to bolster children's wellbeing, through which school-based health promotion initiatives which foster self-regulation skills are a viable avenue. Lastly, this introductory chapter will summarize the research objectives, attributions, and thesis organization.

1.2 Wellbeing Status of Canadian Children and School-based Health Promotion

The most recent epidemiological studies reveal that as many as 14-25% (over 800,000) of children and youth in Canada experience significant social-emotional and/or mental health issues (Boyle & Georgiades, 2009; Canadian Institute for Health Information, 2009; Waddell, Offord, et al., 2002; Waddell, Shepherd, et al., 2013;). Social-emotional issues and mental health (termed wellbeing hereafter) concerns can underscore a multitude of negative outcomes, including issues with social functioning, lower educational achievement, as well as reduced life expectancy (Bhatia, 2007; Kessler et al., 1995). The aptitude to regulate one's self can have a significant impact on one's wellbeing (Essau, LeBlanc, & Ollendick 2017). For example, unregulated or dysregulated emotional reactions have been shown to lead to social problems, behaviour concerns, learning difficulties, and the increased risk of psychopathology later in life (Compas et al., 2017; Cole, Hall, & Hajal, 2008; D'Agostino et al., 2017; Holtmann et al., 2011). Consequently, the wellbeing of Canadian children is a public health problem that warrants

attention given its impact on a child's overall health, positive development, and academic success.

A multitude of interconnected and multifaceted systems and factors influence the wellbeing and self-regulatory capacity in children. The environmental contexts and settings children are located within bidirectionally influence one another (Bronfenbrenner, 1979; 1992). The school environment is one integral and critical setting to most children's lives as they spend a substantial amount of their time within this setting (Epstein, 2011; MacCloud & Hasan, 2017). As a result, health promotion efforts in schools have grown (Leschied, Saklofske, & Flett, 2018; Weist & Murray, 2008); however, given the financial and human resource constraints school systems in Canada already face, rationalizing the time spent in schools promoting health (and wellbeing) is imperatively necessary (Veugelers & Schwartz, 2010). Health promotion frameworks, initiatives, and strategies which have been shown to bolster children's wellbeing and educational outcomes is a start to such rationalizations (Barnes, 2019; Watson & Emery, 2012). Children with mental health concerns that go without support have impairments to their learning, and can lead to chronic absenteeism, difficulty meeting current grade-level curriculum standards, as well as leaving school entirely prematurely (Adelman & Taylor, 2009; McEwan, Waddell, & Barker, 2007; Saluja et al., 2004). Overarchingly, good evidence exists to underscore the importance of health promotion efforts in school settings.

1.3 Ecological Systems Theory

An individual child does not exist in a vacuum; every child has direct and indirect relationships with the families, communities, and societies they find themselves in. The internal aspects of a child interact with the environmental contexts that child is located within, which reciprocally influences in varying degrees how they develop. This concept is explained by

Bronfenbrenner's ecological systems theory (1979, 1992), which "provides a framework through which to understand human behaviour and development as a function of individuals' interactions with their environment, including how social relationships and surrounding environments affect individuals' development" (p.771, Silvi & Scott-Parker, 2018). These internal and external environmental aspects that influence children's development are categorized into four levels, including the microsystem, mesosystem, exosystem, and macrosystem. A child's immediate environment is their microsystem, containing their close relationships, activities, and places they interact with frequently, including their caregivers, school, close friends, neighborhood, religious institutions, and recreation/sporting centers they regularly attend. These close relationships and places impact how a child develops; the more nurturing and supportive the relationships in these close groups are, the higher chance a child will positively develop (Crosnoe & Elder, 2004; Laursen & Mooney, 2008). In turn, how a child reacts and interacts in their immediate relationships will influence how these close people treat that child.

The next level in Bronfenbrenner's theory is the mesosystem, which highlights how a child's various microsystems interact, and how these interactions impact a child's development. For instance, children with caregivers that participate in that child's school and are invested in facilitating school learning at home will fare better academically than children with caregivers who do not (LaRocque, Kleiman, & Darling, 2011). These connections among close contexts are also illuminated by the relationship between child's family experiences and friend experiences as well as between neighborhood experiences and sports practice experiences. For example, a child who witnesses conflict between their caregivers at home (family experiences), may withdraw from their peers on the school playground (impacting their experiences with friends, as well as their school experiences).

The third level, the exosystem, contains the 'at-arms-length' constellation of people, places, and organizations that the child does not interact with directly yet still have an impact indirectly on that child. These contexts can include a child's caregivers' workplaces, the city they live in, school authority or system funding and mandates, as well as extended family members. For example, if a caregiver feels extremely stressed by their workplace, this could have negative implications on their ability to be present and positive with their child when they get home, influencing how that child develops, even though that child is not an active, direct participant in their caregiver's workplace.

Lastly, the macrosystem is the largest and most distant cultural or societal contexts a child finds themselves in, yet the overarching belief systems or ideologies that underlie their particular culture or society still has an effect on that child (Bronfenbrenner, 1979). These contexts include such structures as cultural norms, federal political customs, the economy, policies and laws, societal technological advancement, as well as the degree of peace and stability in the nation or society that the child is living in. For instance, whether or when a child is allowed to attend public school, what their daily nutritional intake consists of, and to what degree there are opportunities to participate in sports or the creative arts are all influenced by the macrosystem.

Recognizing the interrelation of these systems, and the influences they have on an individual, is important when promoting health and wellbeing. When efforts are made to understand and promote wellbeing at the microsystem level, it is important to recognize the myriad of systemic factors influencing an individual's current and future state of wellbeing.

1.4 Health (and Wellbeing) Promotion

Health promotion as a field of scientific study and practice is as, or even more, crucial today to support public health as it was 75 years ago when Henry E. Sigerist first coined the term in 1945 (WHO, 1986). Forty-one years later in 1986, at the First International Conference on Health Promotion, the Ottawa Charter for Health Promotion was launched (WHO, 1986. With this charter came the still widely recognized and utilized definition of health promotion as "the process of enabling people to increase control over, and to improve, their health" as it "represents a mediating strategy between people and their environments, synthesizing personal choice and social responsibility in health to create a healthier future" (WHO, 1986). Health promotion as a field incorporates five key action areas: developing personal skills, creating supportive environments for health, strengthening community action for health, building healthy public policy, and re-orientating health services, along with three fundamental strategies to move the action areas forward: enable, mediate, and advocate (WHO, 1986). In other more recent terms, health promotion emphasizes a holistic approach as it "should empower individuals and communities to take actions for their own health, foster leadership for public health, promote intersectoral action to build healthy public policies and create sustainable health systems in the society" (p. 6, Kumar & Preetha, 2012).

Fundamentally, there are three mechanisms essential to health promotion including: 1) self-care, 2) mutual aid, and 3) healthy environments (Epp, 1986). 'Self-care' refers to the decision and actions an individual takes with the intention of preserving or improving their health. 'Mutual-aid', frequently referred to as social support, refers to individual's working together and supporting each other to cope with health concerns faced individually or as a group. 'Healthy environments' refers to adapting social or physical situations and settings in ways

conducive to maintaining and enhancing health (Epp, 1986). Overall, health promotion is any combination of health, education, political, or organizational initiative with the purpose of fostering positive developmental, behavioural, attitudinal, social, or environmental changes to improve the health of populations through involvement of organizations outside of traditional health care settings, such as home, school, and community organizations and contexts.

Health promotion utilizes a strength-based lens to improve the health of populations, which can be traced back to the WHO definition of health that emphasizes "complete health" as not merely the absence of disease or infirmary, but a state of complete physical, mental, and social wellbeing (WHO, 1946). "To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment" (WHO, 1986). With the chronicity of illness worldwide (Hamm et al., 2019; Naghavi et al., 2017), coupled with a global pandemic (i.e., COVID-19) that has put significant social, emotional, and mental health strain on many individuals (Khan et al., 2020; Nicola et al., 2020; Xiong et al., 2020), reaching the threshold of "complete health" as defined by the WHO seems unattainable and thus an outdated definition of health (Smith, 2008). Huber and colleagues (2011) proposed an updated concept of health as "the ability to adapt and self-manage in the face of social, physical, and emotional challenges" (p.1). By amalgamating the two definitions, I view wellbeing in this study within the conceptualization of health as an individual's or organization's ability to adapt, change, manage, or cope with ecological system influences in order to satisfy needs, including social and emotional needs, in order to realize complete wellbeing. Initiatives promoting self-care, social support, and healthy environments are key to promoting this ability.

Along with these definitions of health, it is no surprise that globally there is growing acceptance that wellbeing has many determinants outside of genetic factors and the biomedical health system, including ecological systems of family, social and cultural ecologies, demographic patterns, as well as learning environments (Kumar & Preetha, 2012). Unequal distribution of social determinants of health including power, resources, income, goods, and services result in unfair conditions of people's lives such as disparate access, quality, and quantity of health care, education, work conditions, and built environments (Marmot & Wilkinson, 2005). Inequities and disparities in the social determinants of health at the micro-, meso-, exo-, and macro-system underscore the deteriorating wellbeing of young students (Currie et al., 2009; Moore et al., 2015), and is explained further by the Equity Theory of Health Promotion (Chen et al., 2014; Tones & Tilford, 2001). Simply put and to provide context to this thesis, the sociocultural conditions a child is born into impacts their health and wellbeing (Viner et al., 2012); therefore, holistic, strengths-based, systemic approaches to improve children and youth's ability to adapt, change, manage, and/or cope with and within their environments are important facets to promoting complete wellbeing. As such, it is important that efforts to improve wellbeing of children and youth are understood and delivered within a health promotion framework that attends not only to the individual themselves, but also to the systems influencing them. One such health promotion framework that attends to both is Comprehensive School Health (JCSH, 2022).

1.5 Comprehensive School Health

Informed by a social ecological lens, the Comprehensive School Health (CSH) approach recognizes that addressing the intersectoral and multifaceted influences of personal, school, home, and community environments in the health promotion of children and youth is of great

importance (Beck et al., 2021; Meeks, Heit, & Page, 2012; Turunen et al., 2017; WHO, 1997). The World Health Organization, along with other international agencies such as UNESCO and UNICEF, for decades have had the goal to promote health via schools (WHO, 1996). The CSH approach is based on the model for a health promoting school which was created and defined almost 25 years ago as "a place where all members of the school community work together to provide students with integrated and positive experiences and structures which promote and protect their health" (p. 2, WHO, 1996). Currently, CSH can be defined as, "an internationally recognized framework that holistically addresses school health by transforming the culture of the school, incorporating individual, interpersonal, community and organizational factors" (p. 2, Neely, Montemurro, & Storey, 2020). As such, it is through a CSH lens one can better understand children and youth's wellbeing as a reciprocal function of school, home, and community environments.

Across Canada, as well as internationally, the CSH framework is being widely utilized, although it may also be known as 'Health Promoting Schools', 'school-based health promotion', the 'Whole School, Whole Community, Whole Child Model', or 'Coordinated School Health' (Centres for Disease Control and Prevention, 2020; JCSH, 2022a). While the specific components of these various titles may be applied in different ways, they are all united by the same underlying concepts set forth in the World Health Organization's Ottawa Charter for Health Promotion (1986). Specifically, CSH is comprised of 4 interrelated components including: teaching and learning, social and physical environments, partnerships and services, and policy (JCSH, 2022a). Additionally, rather than focusing only on students identified with (or at-risk of) social, emotional or mental disorders, CSH utilizes an equitable approach for promoting the wellbeing of every student (Mental Health Commission of Canada, 2013; Pufall

Jones, Hatfield, & Connolly, 2020). In sum, CSH provides an equitable holistic framework to understand and address the deteriorating wellbeing status of children and youth.

1.6 Rationale

There is substantial rationale to explore students' perceptions of participating in a mindfulness-based initiative in schools. While significant evidence exists supporting the effectiveness of mindfulness-based initiatives on student health, wellbeing, and academic outcomes (see section 2.3.4), the voices and perspectives of students regarding their experience and their own perception of the impacts of these initiatives is lacking. The paucity of such data underscores deficits in current understanding of how to optimally improve students' wellbeing. Understanding students' experiences and perceptions of impacts to their wellbeing is therefore important to study. Findings from this study could provide contextual implementation considerations for mindfulness-based initiatives in schools, which can support efforts to more holistically understand and improve school-based wellbeing promotion for children.

1.7 Research Purpose and Objective

This research was driven by qualitative inquiry and community engaged scholarship and aligned with a participatory approach. Through a case study and descriptive qualitative method, students' experiences and perspectives were gathered utilizing a photovoice-informed data generating strategy which involved students taking photographs, journaling about them, and sharing about them in small group discussions to explore how students perceived the impacts of participating in a mindfulness-based initiative in school.

The research objective of this thesis was to explore and gain an understanding of students' perceived impacts of participating in a mindfulness-based initiative in school.

1.8 Thesis Attributions

This thesis is one component of my Master of Science in General Public Health from the University of Alberta School of Public Health. This study was done in partnership with specific psychology academics from Red Deer Polytechnic. My former undergraduate Independent Study supervisor, Dr. Anomi Bearden, and her current Independent Study student conducted a separate quantitative study utilizing the same HeartMath Pilot Program and participant group. The quantitative study was outcomes-based, utilizing biofeedback and self-report survey data. Academic research and knowledge users identified a need to explore how students in this study experienced the HeartMath Pilot Program and their perceived impacts, especially to inform future program delivery. This collaboratively designed and implemented project will help to further our understanding of children's perceptions of practicing a mindfulness-based initiative in school.

The paucity of evidence pertaining to children's perceptions of practicing a mindfulness-based initiative within schools in Canada underscored the need for further investigation. The HeartMath Pilot Program was collaboratively decided upon by the community-based research team as the mindfulness-based initiative to be implemented. My research was driven by using a case study to explore this pilot program's impact from students' perspectives. Photovoice was an appropriate data generation strategy given that it is participant-orientated, can help to facilitate discussion with and amongst children, as well as produces visually engaging knowledge translation materials (Wang & Burris, 1997).

This research project was conducted and completed by myself as original work. I was responsible for proposing the research, developing the research objective, selecting appropriate methods, obtaining ethics approval, conducting data collecting, analysis and writing, which was

done with the support and guidance of my supervisors and committee members. Data analysis was also supported by a research assistant to aid in the credibility of the findings (Braun & Clarke, 2006; Mayan, 2009; McKernan, 2016). I was actively involved in all stages of the planning and decision-making process. Therefore, this thesis in its entirety presents original data developed and conducted by myself and my thesis committee.

1.9 Thesis Organization

This traditional thesis is organized into five chapters. The second chapter provides an extensive review of relevant literature within the scope of this study, and serves to position this research project within the existing literature. My literature review provided an overview of the current status, determinants, and outcomes of wellbeing of children and youth in Canada; the CSH framework in terms of wellbeing and mindfulness-based initiatives in schools; and the importance of the current this research. Chapter three described and explained the research paradigm, theoretical perspective, methodology and methods, data generation, data analysis, and results. Chapter four summarized the research findings and themes of this study. Chapter five summarized the strengths, weaknesses, implications, and future directions suggested based on this research project. References and appendices are located at the end of the thesis.

CHAPTER 2: LITERATURE REVIEW

2.1 Wellbeing Status of Children and Youth in Canada

Population studies reveal that approximately 1.1 million children and youth in Canada suffer from significant mental health issues and disorders (Boyle & Georgiades, 2010; Gandhi et al., 2016; Canadian Institute for Health Information, 2009; Waddell et al., 2002; Weins et al., 2020). More than half of all mental illnesses, including attention deficit/hyperactivity disorder, depression, anxiety, and severe emotional disorder, surface during or before the preadolescent stage, specifically before the age of 14 (Kessler et al., 2005; Kirby & Keon, 2004; Waddell & Shepherd, 2002). Suicide is currently the second leading cause of death among Canadian youth (Government of Canada, 2021), ranking us third in industrialized countries for this tragedy (Canadian Mental Health Association, 2014).

Unfortunately, most youth (approximately 1 in 6) do not receive treatment for mental health difficulties, and for the minority who receive help, services are usually inadequate (Canadian Psychiatric Association, 2012; Koller & Bertel, 2006; Waddell et al., 2013). Canadian youth encounter significant barriers to accessing support services, including facing social stigma associated with mental health concerns and seeking help (Schachter et al., 2008), long wait times extending up to a year for accessing publicly funded professional help, and limited financial resources for accessing private services (Centre for Addiction and Mental Health, 2018; Kirby & Keon, 2006). For many children and youth who have a mental health disorder suffering continues into adulthood, especially those who do not receive adequate support and intervention during their youth development (Wiens et al., 2020). Consequently, the need for promoting wellbeing in children and youth in Canada is evident.

2.1.1 Determinants and outcomes of wellbeing status in Canadian youth

Wellbeing is influenced not only by individual attributes, characteristics, and choices, but also by a plethora of physical and social determinants of health (Viner et al., 2012; WHO, 2012). The ecological systems youth find themselves a part of impact their wellbeing, including the socio-demographic, family circumstances, human capital, and wider environments in which they live (Capaldi, Varin, & Dopko, 2021; Fleche, Smith, & Sorsa, 2012; Patalay & Fitzsimons, 2018; WHO, 2012). These individual and social-ecological determinants dynamically interact with each other, to bolster or threaten youths' wellbeing (Orpana et al., 2016; Patton et al., 2016).

The literature is well established that fostering health and wellbeing for youth and adolescents is critical for their positive growth and development which can improve range of physical, psychological, emotional, and social outcomes (Sawyer et al., 2012; Varin et al., 2020). Mental health and wellbeing are considered to be an integral part of health and fundamental to one's quality of life (Currie & Morgan, 2020; Meade & Dowswell, 2016; Prince et al., 2007), and have implications for young people's behaviour, self-esteem, educational achievement, attendance at school, positive social relationships, and future health (Gómez-López, Viejo, & Ortega-Ruiz, 2019; Inchley & Currie, 2016).

Since the determinants and outcomes of young people's wellbeing are broad and wide-ranging, it is imperative that wellbeing promotion initiatives are prioritized and implemented in ways that are multi-faceted and cross-sectoral. School-based health promotion initiatives, especially when implemented through a CSH framework, can be one such holistic and systemic approach to addressing wellbeing in youth (JCSH, 2022a; Neely, Montemurro, & Storey, 2020).

2.2 School-based Health Promotion Initiatives

The promotion of positive mental health and wellbeing have been identified as crucial priorities in Canada, as well as worldwide (Mental Health Commission of Canada, 2012; WHO, 2013). In the words of the Ottawa Charter, "Health is created and lived by people within the settings of their everyday life; where they learn, work, play and love" (WHO, 1986). As such, educational settings have a unique position in supporting students' wellbeing because they are highly accessible, can be more cost-effective as compared to hospital or community-based clinical services, as well as can help mitigate the stigma associated with wellbeing concerns (Canadian Psychiatric Association, 2012; Stephan et al. 2007; Weare and Nind, 2011). If health promotion initiatives were implemented in every public school (where 94.1% of youth attend) in Alberta in the 2019/2020 school year, nearly half a million (493 990) students could have benefited (Alberta Education, 2020; MacCloud & Hasan, 2017).

Nevertheless, accessibility, cost-efficiency, and stigma mitigation are not sufficient rationales to implement health promotion initiatives in schools. Frequently, teachers are called upon to promote, prevent, and address to the wellbeing of their students; however, limited training and professional development in mental health initiatives along with inadequate financial resources and current curriculum time constraints transpire into teachers alone not being supported well enough to effectively attend to the wellbeing of their students (Koller & Bertel, 2006; Mental Health Commission of Canada, 2012; Short et al., 2009). This is especially evident when implementing and sustaining wellbeing programs tend to be viewed by many school authorities and staff as yet another 'add-on' into an already busy and often over-burdened school environment (Bentsen et al., 2020). This deficit of adequate support exists despite evidence that student health directly effects academic performance, with healthier students

demonstrating superior learning outcomes (Faught et al., 2017; García-Hermoso et al., 2021; Shaw et al., 2015; Suhrcke & de Paz Nieves, 2011).

Therefore, accessibility, cost-efficiency, stigma mitigation as well as a reciprocally supporting relationship between student health and academic outcomes provide the justifications for promoting health and wellbeing in schools. In 2012, the Mental Health Strategy for Canada identified child and youth mental health as a priority and called for comprehensive, school-wide initiatives that promote positive social and emotional wellbeing development and reduce stigma (The Mental Health Commission of Canada, 2013). The Comprehensive School Health (CSH) approach is one of the most recognized and successful universal school-based health promotion models (JCSH, 2022) and is strongly recommended by the WHO to be implemented in schools (Ross et al., 2021; WHO, 2021)

2.2.1 Evidence of Comprehensive School Health

The CSH approach, described in section 1.5, has demonstrated success in aiding students in fostering health and health-enhancing behaviours, including changes in behaviours related to nutrition, physical activity, bullying, and smoking (Fung et al., 2012; Langford et al., 2015), and improvements in students' health outcomes including physical fitness, body mass index, and nutrition intake (Ofosu et al., 2018; Veugelers & Schwartz, 2010). Furthermore, studies have also shown that CSH can improve academic outcomes (Akiyama et al., 2020; Centeio et al., 2021; Langford et al., 2015). Given its demonstrated success, all provinces (except Quebec), including 25 ministries of health, health promotion and education in Canada committed to The Joint Consortium for School Health (JCSH; 2022a) Priority Areas (2020-2025).

Studies on the effects of the CSH approach have primarily focused on students' physiological tenants of health including physical activity, consumption of healthy foods

(Centeio et al., 2018; Fung et al., 2012; Langford et al., 2015; Ofosu et al., 2018), and sleep (Bird et al., 2021; McKernan, 2016; McKernan et al., 2019). Only one study I could find focused on the social and emotional wellbeing impacts of the HPS approach (assessed quantitatively by the Quality of Life in School (QOLS) instrument), which did not find statistically significant differences between HPS and non-HPS as assessed (McIsaac et al., 2017). More than 10 years ago, Wei, Kutcher, and Szumilas (2011), put forth a comprehensive Canadian secondary school mental health model, based on the WHO Health Promoting Schools model (1996). Their model is comprised of a series of inter-related domains including: "a) mental health promotion through mental health literacy for youth, educators, and families; b) training for teachers, student services providers, and primary care providers, with knowledge upgrading for mental health professionals, to facilitate early identification, prevention and intervention; c) processes for coordination and collaboration between schools and their communities; and d) evaluation." (p. 218). I could not, however, find any research utilizing this model in a CSH approach to implement school-based mental health promotion initiatives aimed specifically at wellbeing. Given the dearth in the literature on this topic, Langford and their colleagues (2017) put forth an agenda calling for more research utilizing the CSH framework that is focused on adolescent mental health as well as wellbeing.

Outside of the CSH model, school-based health interventions have also historically focused on the tenants of physical activity and healthy eating behaviours (Robinson et al., 2018). Health and educational authorities in Canada have posited the need to address student health holistically (Dumuid et al., 2017). Current school-based health promotion directives promote the importance of fostering a multitude of health behaviours to holistically address student health, including wellbeing in children (Chan et al., 2019).

In the field of school-based wellbeing promotion, social-emotional learning (SEL) has been increasingly recognized as a foundation for bolstering positive wellbeing in students and the school, home, community systems (Greenberg, Domitrovich, & Bumbarger, 2001; Sklad et al., 2012; Wells, Barlow, & Stewart-Brown, 2003). SEL is the process via which students learn to recognize and manage their emotions, show care and empathy towards themselves and others, behave responsibly, and develop positive relationships; it includes five areas of competence: self-awareness, social awareness, self-management, relationship skills, and responsible decision making (Elias et al., 1997; CASEL, 2022a; Durlak et al., 2015; Zins et al., 2004).

Students participating in school-based SEL programs show improvements in social-emotional competencies, prosocial behaviour, classroom conduct, attitudes about themselves and others, academic achievement, as well as decreases in stress, depression, and anxiety (Durlak et al., 2011). In a 2017 meta-analysis of school-based SEL interventions, participating students had significant improvements in social-emotional skills, attitudes, and indicators of wellbeing (Taylor et al., 2017). Considering that SEL has a strong focus on teaching self-regulation skills to children and youth, the findings from a meta-analysis conducted by Robson, Allen, and Howard (2020) are important to note, particularly that self-regulation in youth is positively associated with academic performance, social competency, school engagement and negatively associated with aggressive behaviour, obesity, and depressive symptoms. Overall, fostering SEL through school-based health promotion shows promising results in improving student wellbeing.

In research conducted by Storey and her colleagues (2016) on the essential conditions for implementing CSH to achieve improvements in the health and wellbeing behaviours of students, core conditions were identified including students as change makers and school-specific autonomy. These conditions underscore the imperativeness of including student voices and

students serving as change makers through peer-to-peer interactions as well as the required customization and flexibility of initiatives to build upon school strengths to meet local needs (Neely, Montemurro, & Storey, 2020). Additionally, in a scoping study on health promoting schools, Lee and their colleagues (2020) press the importance of schools using "innovative and student-orientated strategies and formats when implementing health education and promotion activities" (p. 615). Given these imperatives, and the evidence supporting SEL initiatives in schools, the school community-partnered research team involved in this study put forth the need for a student-orientated SEL initiative that could be customized to utilize their strengths and meet their local classroom needs. Through this lens of school-specific autonomy, an initiative that was mindfulness-based was proposed as the team speculated that through such a student-oriented innovative initiative students could be empowered as change agents, especially through peer-to-peer interactions. Furthermore, extensive research has demonstrated the effectiveness of mindfulness-based practices in schools on enhancing students' core competencies of SEL, providing crucial foundations in promoting their wellbeing (Chan et al., 2019). While not a full CSH intervention, a pilot program of a mindfulness-based initiative informed by the CSH model in school specified classrooms was proposed by the team as the basis of this research.

2.3 Mindfulness-Based Initiatives in Schools

2.3.1 What is mindfulness

There exists a myriad of definitions for mindfulness across fields of study and settings, at its core though is the common theme that mindfulness is a way of willfully directing attention (Schonert-Reichl, 2010). The state of consciousness or psychological capacity to become and stay self-aware with enhanced attention to the present moment or experience in an open, curious, non-judgmental way is what characterizes mindfulness (Brown & Ryan, 2003; Kabat-Zinn,

1990; Kabat-Zinn & Hanh, 1990; Segal et al., 2002). With origins in Buddhism and other eastern traditions such as Taoist meditation (Bankart, 2003; Shear, 2006; Wallace & Shapiro, 2006), mindfulness in modern western societies is largely a non-denominational practice. Formally, mindfulness is taught through meditation practices of which common techniques are sitting meditation or movement meditation (for example yoga, qigong, or tai chi; Breedvelt et al., 2019; Ospina, 2007).

One common focus of attention, or 'anchor', during mindfulness is one's breath because it is a here-and-now, moment-to-moment sensory experience (Kabat-Zinn, 2012; 2015). When the mind drifts away to other thoughts, feelings, or sensations, the practitioner of mindfulness without judgment and with self-kindness brings their attention and awareness back to their breath. Other common anchors are a thought (commonly referred to as a mantra), feeling, sensation, or experience they have chosen as their anchor to the present moment. In this way, the practitioner trains themselves to simply observe their thoughts, feelings, sensations, and experiences of the present moment, without immediate unconscious reactions (Zenner, Herrnleben-Kurz, & Walach, 2014). It is through such a practice that skills in self-awareness and self-regulation can be fostered.

The opposite of mindfulness is mindlessness or mind-wandering (Smallwood & Schooler, 2006). Consciousness, awareness, and attention that are constrained (such as by worries about the futures or rumination about the past), preoccupied with other current concerns, or divided by multiple tasks or focal points are generally agreed to *not* comprise mindfulness (Brown & Ryan, 2003; Schonert-Reichl, 2010). Modern western society is rife with constrained, preoccupied, divided, and compromised awareness that limits our ability to focus and 'just be' in the present moment, acknowledging what we think, feel, and perceive in this moment, without

judgment or attachment. Much of our daily lives may be lived on 'auto-pilot' whereby we engage in our daily behaviours in a compulsive or automatic way, rather than with focused attention and awareness (Kabat-Zinn, 1990; Segal et al., 2002).

This 'auto-pilot' or mindlessness, has been associated with activity of the default-mode network (DMN), which are areas of the brain that becomes active when one's cognitive system is idle (Raichle et al., 2001). Increased activation of the DMN is linked to increased negative emotional states as well as the frequency of attentional mistakes (Smallwood, Mrazek, & Schooler, 2011). Experienced meditators exhibit reduced baseline activity of the DMN (Pagnoni, Cekic, & Guo, 2008). Therefore, reducing mindlessness/mind-wandering while improving attention capacity and capabilities could be one of the mechanisms through which mindfulness-based approaches work to promote wellbeing (Gu et al., 2015; Carmody, 2009).

Another perspective is that by reducing the frequency and duration of one's propensity to avoid unwanted or uncomfortable thoughts, feelings, and experiences leads to improvements overall positive affect (Kok & Fredrickson, 2010; Sauer, Walach, & Kohls, 2011) which is associated with prosocial behaviour (Hammond & Drummand, 2019; Kok et al., 2013). From a neural perspective, another mechanism via mindfulness could be proposed to improve wellbeing is through changes in gray matter density in brain areas involved in emotion regulation, perspective taking, as well as learning and memory processes (Hölzel, Carmody et al., 2011; Hölzel, Lazar et al., 2011).

2.3.3 Mindfulness with youth

Evidence on the effectiveness of mindfulness-based interventions (MBIs) in children and youth is substantial. Many studies on MBIs have focused on easing symptoms of already diagnosed mental disorders in youth (rather than attention on prevention or health promotion),

such as reducing symptoms of anxiety (Klingbeil et al., 2017; Vøllestad, Nielsen, & Nielsen, 2012; Zoogman et al., 2015), depression (Blanck et al., 2018; Dunning et al., 2019), ADHD (Cairncross & Miller, 2020; Poissant et al., 2019), and externalizing disorders underpinned by aggression (Gillions, Cheang, & Duarte, 2019; Sibinga et al., 2011). Evaluations of MBIs have also tended to focus on clinical or targeted sub sections of populations of children and youth (Borquist-Conlon et al., 2019; Cachia, Anderson, & Moore, 2016; Evans et al., 2018). Given MBIs demonstrated effects in reducing symptoms of a particular disorder or concern in a specific clinical sub-section, it makes good sense to adapt MBIs to be more mindfulness-based initiatives (rather than interventions) for children and youth with and without specific mental health concerns, in a universal setting such as schools.

2.3.4 Evidence of mindfulness with youth in schools

Practicing mindfulness can foster the skills necessary for educational success, as students must learn to redirect their mind, regulate their emotions, cope with challenges, and self-motivate in order to be successful in a classroom setting and optimize their academic achievement (Schonert-Reichl et al., 2015; Zenner, Herrnleben-Kurz, & Walach, 2014). The very qualities and goals of education in modern western societies can be facilitated by mindfulness practice, beyond attentional and emotional regulation, to also promote prosocial dispositions of compassion, empathy, and conflict resolution skills (Schonert-Reichl & Roeser, 2016; Shapiro et al., 2015). Given its potential and growing interest for use with students, various research institutes and agencies facilitate conferences, workshops, meetings, and online resources for educators, clinicians, and researchers to discuss best practices and strategies of integrating mindfulness into education, examples include the Garrison Institute, Mindfulness in Education Network, and the Association of Mindfulness in Education.

Several meta-analyses of MBIs in school environments with children and youth have been conducted within the past decade. Zenner, Herrnleben-Kurz, and Walach (2014) reported a medium effect size across all studies in outcomes of cognitive performance, stress and coping, and resilience. They found a small non-significant effect for emotional problems. Carsley and their colleagues (2018) found small significant effects for mental health and wellbeing outcomes, and Maynard and their colleagues (2017) found a small significant effect of MBIs on social emotional outcomes of social skills, stress, engagement, and anxiety. A general limitation of most of the studies included in these meta-analysis studies was a lack of reporting study details including limited descriptions of the MBI implementation, participants, and school types, thus additional research on mindfulness-based initiatives in schools is warranted (Felver et al., 2016).

Without detailed, quality information about the actual delivery of MBIs in school settings, scrutiny is warranted about whether they were implemented as intended (Durlak & DuPre, 2008; Van Dam et al., 2018). In Zenner, Herrnleben-Kurz, and Walach's (2014) review, teachers were most often the implementors of programs (with teachers reporting they delivered the approaches, programs, or mindfulness curricula 75% of the time). The most common frequency of implementation was delivering mindfulness exercises three times a day, every day, for nine weeks (at 87%). Durlak and DuPre (2008) highlight that, "Expecting perfect or near-perfect implementation is unrealistic. Positive results have often been obtained with levels around 60%; few studies have attained levels greater than 80%. No study has documented 100% implementation for all providers" (p. 331). Consequently, it is imperative that future research studies exploring mindfulness practices with students be clear and detailed when reporting on implementation.

Most studies and meta-analyses on MBIs in school focus on quantitative outcomes. However, a recent systematic review on the impacts of MBIs in schools with children did mention the qualitative results analyzed indicated that students experienced benefits to their wellbeing, including benefits in mental, emotional, physical, relational, as well as academic domains (McKeering & Hwang, 2019). Children perceived that mindfulness helped them to feel calm, to reduce their stress, to better regulate difficult emotions, and to react less impulsively. Following, the improvements in self-regulation through practicing mindfulness was shown to help students exhibit more pro-social behaviours and make more friends, improve their classroom behavior, as well as reduce their test anxiety, contributing to enhanced academic performance.

In the first systematic review and thematic analysis of qualitative studies focusing on students' experience of mindfulness-based interventions in schools, Sapthiang, Van Gordon, and Shonin (2019) identified four major themes: 1) using attentional processes to regulate emotions and cognitions, 2) stress reduction, 3) improved coping and social skills, and 4) calming and relaxing. Practicing mindfulness in school was perceived by students to have increased their mindful attention and self-awareness, which led them to better emotional and cognitive (i.e., self-) regulation. These findings are aligned with Andreu, Araya-Véliz, and García-Rubio recent (2021) qualitative study on the perceptions of at-risk children participating in a mindfulness-based intervention in school which concluded that mindfulness helped students better regulate difficult emotions, reduce their stress, and to react less impulsively.

Overall, the research on mindfulness-based interventions in schools indicates that it is one viable strategy for promoting wellbeing in students (Brown, Hattouni, & Russell, 2020). Qualitative research giving a voice to students and focusing on their perceptions of the impacts

of practicing mindfulness in school is a growing field that warrants more attention, especially in Canada. Developing research in this area could lead to better insights and understandings into how best to implement mindfulness-based initiatives in schools.

The early adolescent years (ages ~9-11 years) are a crucial developmental period when attitudes, skills, behaviours, and competencies are not only formed, but can solidify and persist into adulthood (Eccles & Roeser, 2009; Graber & Brooks-Gunn, 1996). Thus, during these transitional years lies an opportunity to foster mindfulness-based skills to encourage self-regulation and foster positive social relationships which could promote wellbeing during this phase of life as well as into the future. The effectiveness of mindfulness programs with early childhood students in schools is a relatively more limited but growing field of research which also tends to focus on quantitative outcomes of such programs, rather than the qualitative experiences of early childhood participants (Flook et al., 2015; Razza, Bergen-Cico, & Raymond, 2015; Zelazo et al., 2018; Zelazo & Lyons, 2012). This could be because it is usually in the early preadolescent years that children generally become more reflective and self-aware with the cognitive capacity to express and explain their experiences (Eccles, 1999; Nilson, 2013; Sands et al., 2009; Sauter et al., 2010), and use operational thinking (Huitt & Hummel, 2003) in greater breadth and depth than younger students. As such, in an attempt to address the research question and contribute to the scarce qualitative literature in Canada exploring children's experiences and perceived impacts of participating in a mindfulness-based initiative in school, early adolescence is the age focused on in this study.

2.4 HeartMath: A Mindfulness-Based Program

HeartMath is one mindfulness-based program that can be used as a program to promote wellbeing in preadolescents within a school setting (Childre & Martin, 1999). The reasons for

choosing HeartMath as the mindfulness-based initiative to implement for this study, out of the many mindfulness-based programs that exist include: 1) it was collaboratively decided upon by the community-partnered research team, 2) its focus on teaching and practicing mindful self-regulation, and 3) its inclusion of a biofeedback tool. HeartMath is rooted in mindfulness as the practitioner is taught through different strategies and techniques to tap into the present moment with focused awareness, commonly through attention to one's breath (Bishop et al., 2004; Childre & Martin, 1999, 2011).

2.4.1 What is HeartMath

There are specific self-regulation tools, techniques, and technologies that comprise 'HeartMath' (a.k.a. 'practicing HeartMath' or a 'HeartMath program'). HeartMath began at The Heart Math Institute (HMI) which was founded as a non-profit research and education organization in 1991 with a focus on developing techniques and tools to facilitate coping and emotional self-regulation (Childre & Martin, 1999; HeartMath Institute, 2022a). Currently, it is an interactive program in which any individual or organization can access books, training, tools, and/or technology that facilitate practicing HeartMath through the HeartMath.com website.

HeartMath, at its essence, is practicing mindfulness-based skills through guided exercises, which primarily focuses on paying attention to and regulating one's breathing and one's emotional state (Boehm & Kubzansky, 2012; Childre & Martin, 1999). These exercises are provided through written, audio, and/or visual guides and foundational teach and prompt individuals to focus on their breathing by taking longer inhales and exhales. There are also practices in gratitude and positive memory recall, while being mindful of one's current physical, psychological, and emotional state. The overarching purpose of the HeartMath system is to teach

and practice mindfulness-based skills that improve self-awareness, self-regulation, and generate positive emotions (McCraty et al., 1999).

These mindfulness-based skills can be supplementarily guided by a biofeedback tool using a smart device through the Inner Balance™ app created by the HMI. With this smart device app, a user can input how they are feeling in the moment and then choose a voice and visually guided mindfulness-based practice session. This app can also be used in conjunction with a clip-on earpiece sensor (or fingertip if the ear lobe is not accessible) connected to a smart device to measure and display instantaneous biofeedback information on a user's "heart rhythm" (term used by the HMI) in real time. (HeartMath Institute, 2022d). See Figure 1 for a reference photograph of the Inner Balance™ app and earpiece sensor.

Figure 1. The HeartMath Inner Balance™ App and Biofeedback Sensor

One's heart rhythm is analogous to one's Heart Rate Variability (HRV) which is the measurement of, "variation in interbeat time intervals among heart beats" (p.76, Economides et al., 2020); thus, it is a measure of how regular or irregular one's pattern of their heart rhythm is

in that moment. The degree to which one's HRV is high (i.e., their heart rhythm is regular, patterned, and consistent) or low (i.e., their heart rhythm pattern is irregular and inconsistent) has been shown to covary with one's stress response (see Kim et al., 2018 for a review), cognitive function (see Forte, Favieri, & Casagrande, 2019 for a review), and emotions (McCraty & Shaffer, 2015; Sztajzel, 2004). Low HRV is associated with emotional and mental health problems and cognitive function concerns (Beauchaine & Thayer, 2015; Camm et al., 1996; Kemp & Quintana, 2013; Thayer & Lane, 2009; Thayer et al., 2009) including anxiety (Chalmers et al., 2014) and depression (Kemp et al., 2010; Schiweck et al., 2019). Inversely, high HRV is associated with relatively superior cardiovascular, emotional, and mental health (Thayer et al., 2012; Walker et al., 2017).

Improvements in self-regulating one's breathing and/or one's emotional wellbeing state are associated with improvements to one's HRV (McCraty & Zayas, 2014). Intentional breathing and elicitation of positive emotions is proposed to increase HRV because positive emotions are reciprocally associated with higher vagal tone (Kok & Fredrickson, 2010; Oveis et al., 2009), which can be measured via HRV (Laborde, Mosley, & Thayer, 2017). Following, the breathing techniques taught and practiced in many mindfulness-based programs, including HeartMath, are associated with improvements in one's HRV (Gevirtz, 2013). How practicing mindful breathing is proposed to improve one's HRV is rooted in the physiological literature on Respiratory Sinus Arrhythmia (RSA; Berntson, Cacioppo, & Grossman, 2007; Grossman & Taylor, 2007). Research on the individual impacts of improved RSA, and thus improved HRV, shows positive associations with better emotional- (Beauchaine, 2015; Tonhajzerova et al., 2016), psychological- (Beauchaine & Thayer, 2015), cognitive- (Overbeek, van Boxtel, & Westerink, 2014; Staton, El-Sheikh, & Buckhalt, 2009), and stress-regulation (Tonhajzerova et al., 2016), as

well as social functioning (Butler, Wilhelm, & Gross, 2006; Geisler et al., 2013). As such, the breathing and emotional regulation skills practiced in HeartMath are important components for a mindfulness program to include due to associated improvements in one's HRV and wellbeing.

There is research to suggest that not only can HRV be measured via biofeedback tools, but that HRV can be increased by utilizing biofeedback as an intervention, treatment, or clinical tool (Gevirtz, 2013; Goessl, Curtiss, & Hofmann, 2017; Lehrer & Gevirtz, 2014; Wheat & Larkin, 2010). Fundamentally, biofeedback as not just a measuring tool but also an intervention tool is rooted in the hypothesis that when HRV is being tracked and displayed in real-time, it can spur awareness and conscious improvement of respiratory regulation (Lehrer & Gevirtz, 2014) and thus reciprocally improve HRV (Blum, Rockstroh, & Göritz, 2019). Using biofeedback HRV tools are associated with improvements in wellbeing by reducing stress (Devi & Sheehy, 2012; Yu et al., 2018; Slavikova et al., 2020). In a recent systematic review, Dormal, Vermeulen, and Mejias' (2021) results showed HRV biofeedback session with children and adolescents can be effective in reducing both mental and physical health-related symptoms as well as promoting wellbeing. In part based on these findings, the community-partnered research team chose to implement HeartMath as the mindfulness-based initiative as it included a biofeedback tool to measure and likely improve HRV, thus further bolstering the potential impacts to students' wellbeing.

2.4.2 HeartMath research in the literature

In my review of the literature, studies exploring the use of HeartMath branded techniques and tools was relatively sparse, unless conducted by the HMI. There exist several studies on mindfulness-based initiatives that include biofeedback tools measuring HRV in a very similar way that HeartMath does, but do not explicitly name that they used patented HeartMath

technology or techniques. Given their comparability, I include research on biofeedback and HRV measurement tools in my review.

2.4.2.1 HeartMath with students in schools

HeartMath and HeartMath-based mindfulness programs have thus far been implemented in preschool (e.g., Bradley et al., 2009), elementary (e.g., Bothe, Grignon, & Olness, 2014; Rush et al., 2017), middle school (McCraty et al., 1999; Rush et al., 2017), high school (e.g., McCraty et al., 2000), and post-secondary settings (Aritzeta et al., 2017; May et al., 2019; Ratanasiripong et al., 2013; Sarwari & Wahab, 2018). Seminally, McCraty and colleagues (1999) conducted a two-part study using HeartMath training with at-risk preadolescent students. Pre- to post-test t-test analyses demonstrated that students' self-reports improved significantly on 17 of the 19 outcome measures, including: stress and anger management, managing their work, focus, risky behaviour, and relationships with peers, teachers, and family. Follow-up analyses of this preliminary study suggested that these changes were sustained at six months post-intervention.

Other findings of research with students practicing HeartMath based techniques have shown significant reductions in in stress, anger, sadness, loneliness as well as test anxiety (Bradley et al., 2010). Pop-Jordanov (2009) similarly found significant improvements in anxiety for students ages 10-15 years of age utilizing the HeartMath biofeedback tool. She also found that all student participants with mental health problems in the intervention group (including anxiety disorders, obsessive-compulsive disorders, ADHD, and conduct disorders) showed significant improvements relative to the control group in neurotic and psychopathological tendencies.

HeartMath has similarly yielded favourable results when used as an intervention specifically for students with ADHD (Lloyd et al., 2010). Lloyd and colleagues (2010)

conducted a randomized control trial over six weeks with 18 preadolescents, aged 9-13 years, diagnosed with ADHD. The participants were taught HeartMath self-regulation techniques using the HRV biofeedback technology. The study results indicated the HeartMath intervention group showed significant positive differences in cognitive function as well as emotional wellbeing (as indicated by the Strengths and Difficulties Questionnaire, Goodman, 1997) as compared to the control group.

Bothe and colleagues (2014) conducted a study evaluating the effects on elementary school students' HRV from participating in a school-based stress management technique. The technique combined focused breathing, intentional movements and stretching (similar to yoga), and guided imagery, similar to those found in mindfulness-approaches. Results indicated a significant reduction in reported anxiety symptoms post-intervention as well as improved autonomic function measured via HRV (measured with HeartMath's biofeedback tool) at the one year follow up measurement, with the control group actually worsening in HRV at the follow-up. This is one of the very few studies that included a qualitative component with the child participants, in which they were asked whether they enjoyed the intervention, as well as if and when and in what situations inside or outside of school they used it on their own. The qualitative results put forth that 14 out of 15 participants reported they did enjoy the intervention in the classroom, 13 reported using it during the school day, and 12 reported using it during stressful situations outside of school. Specifically, the children in their study mentioned they utilized the skills they learned to better handle difficulties in relationships with peers, when angry or upset, and helping them to fall asleep (Bothe et al., 2014).

While the literature regarding the use of HeartMath with children in school settings is still developing, the research reviewed here demonstrates its utility in a school setting, pointing to the

potential for HeartMath to improve students' wellbeing. More research into HeartMath's utility in school settings is warranted. Furthermore, what is notably absent from current mindfulness-based initiatives, including the HeartMath program, is qualitative research with children and youth in schools giving a platform for the voices of students and their perceptions of their experiences participating in such initiatives and programs. Since HeartMath is an experiential practice, and the studies reviewed in this section support its positive quantitative wellbeing impacts for children and youth, qualitatively exploring students' experiences of practicing HeartMath in a classroom setting seems a particularly worthwhile endeavour.

2.4.3 Summary of HeartMath

The overarching purpose of the HeartMath system is to practice mindfulness-based skills, including intentional breathing and emotional regulation, to facilitate skills in self-regulation (McCraty et al., 1999). The literature reviewing HeartMath programs implemented with school-aged children indicate associations with improved wellbeing (Bothe et al., 2014; Bradley et al., 2010; Lloyd et al., 2010; McCraty, 1999; 2000, Pop-Jordanov, 2009). Improvements in wellbeing are suggested to be mediated via improved HRV, which can be measured as well as facilitated by HRV biofeedback tools, such as the HMI's Inner Balance™ app and sensor. The peer-reviewed literature to date on the use of HeartMath in schools with students tends to focus on quantitative impact outcomes (Bothe et al., 2014; HeartMath Institute, 2020b; McCraty et al., 1999) with little-to-no attention paid to participant perceptions of practicing HeartMath.

There have been calls for further research into children's views on wellbeing initiatives in schools to help better understand how to optimally improve children's wellbeing (Hall, 2017; Singletary et al., 2015). This is especially true in Canada, where there is a deficit of qualitative research into mindfulness-based initiatives with students. Given that the subjective state is a key

foundation to mindfulness (Himelstein et al., 2012), the lack of qualitative research giving voice to students about their subject state while practicing mindfulness in schools is a gap in the literature. Following, this study aims to explore Canadian student perceptions of participating in a HeartMath program in their classroom in an attempt to gain a more holistic understanding of students' experiences and impacts of a mindfulness-based initiative in school. Such understandings could underscore useful insights for future research on implementation of mindfulness-based initiatives with children in Canadian schools.

CHAPTER 3: RESEARCH PROCEDURE

3.1 Community-Engaged Scholarship

Community-engaged scholarship (CES), also known as community-engaged research in the literature, involves a mutually beneficial, bidirectional, relationship between the researchers and the community (Ahmed & Palermo 2010; Boyer, 1996; Bringle & Hatcher, 2002; Fitzgerald et al., 2019). This collaborative relationship is usually between researchers and community members associated by geographic proximity, special interests, or similar situations pertaining to issues affecting their wellbeing (Balls-Berry & Acosta-Perez 2017). Community needs typically informs the research question and methodology, with the methods arising collaboratively and organically instead of "by a pre-determined systemic research plan as with traditional research" (p. 49, Barreno et al., 2013). Overarchingly, CES denotes participatory-oriented research (CTSA, 2011), rooted in Participatory Research (PR), in which research designs are born out of systematic inquiry alongside collaborative relationships with those impacted by the issue affecting their wellbeing for the purpose of action or change (Cargo & Mercer, 2008; Vaughn & Jacquez, 2020).

This approach aims for contribution by both university/academic and community partners in the research process (Ortiz et al., 2020). Through collaboration and shared contribution in research, PR "contributes directly to the flourishing of human persons, their communities, and the ecosystems of which they are a part (p. 6, Reason & Tobert, 2001). An overall benefit of PR-style research is that, since it is informed by and thus relevant to real-world contexts, findings are often more effectively translated into community settings (Bush et al., 2017; Cargo & Mercer, 2008). This process supports co-produced understanding about a complex experience by utilizing different perspectives and expertise, including academic theoretical and methodological expertise

along with community knowledge and experience (Fitzgerald, Allen, & Roberts, 2010; Meurer & Diehr, 2012).

Utilizing this approach, a multidisciplinary university-community research team collaboratively guided the design, development, and implementation of this project (McHale & Lerner, 1996; Small, 1996; Springett et al., 2011). This team was co-created with myself and another academic institution heavily involved in CES and was brought together based on the community-led need of self-regulation support in schools. More specifically, two local elementary school educators who frequently team teach their classes together reached out to their Alberta Health Services (AHS) Health Promotion Facilitator and Family and Community Support Services (FCSS) Community Liaison Worker (CLW) for support. The educators expressed their need and willingness to implement a mindfulness-based self-regulation initiative for students in their classrooms. This group then reached out to their local academic institution for guidance on implementing an evidence informed mindfulness-based self-regulation initiative, in which HeartMath was chosen collaboratively as the program to implement.

The multidisciplinary team chose HeartMath as the initiative for three main reasons: 1) the educators requested it as they had learned anecdotally about its utility for students through educators in other school districts, as well as were intrigued by the biofeedback app-based features and wanted to explore the potential benefit for their own students, 2) the local academic institute instructor on the research team was a trained facilitator of HeartMath and the AHS Health Promotion Facilitator was able to provide funding in support of accessing more HeartMath materials and devices for use with the students in the two educators' classrooms, as well as 3) there exists some empirical evidence to support the use of HeartMath to improve self-regulation skills in students. In sum, choosing HeartMath as the initiative was not rooted entirely

in traditional research design by a pre-determined systemic research plan to address gaps in the literature; however, there have been recent calls advocating for community engagement in school-based health initiatives (McMullen et al., 2020; McHugh et al., 2020) through which this program was collaboratively chosen.

3.2 Researcher Positionality

The researcher is also the author of this manuscript and thus will refer to themselves in the first person throughout. Qualitative researchers engage closely with the research process and thus are unable to, and arguably do not want to, avoid personal bias (Tong, Sainsbury, & Craig, 2007). Therefore, I will recognize and clarify my personal characteristics in an effort to give readers the ability to assess how these characteristics might have influenced my observations and interpretations, with the intention of improving upon the credibility of the findings (Guest, MacQueen, & Namey, 2011; Malterud, 2001). I identify as female and completed a Bachelor of Arts Degree in Psychology, during which I was a research assistant for a study that utilized photovoice as a method. Furthermore, I have been employed as a CLW in the same school system but for different elementary schools for 18 months prior to this study, and I practiced mindfulness with students during that employment. This led me to have an affinity and interest towards mindfulness-based activities within a school setting with students.

What my background brings to my research is a curiosity towards the subject under exploration; that is to say, I was curious about what the perceptions of students are when practicing mindfulness. From my background and curiosity comes a bias towards mindfulness-based activities being a helpful endeavour for students. This bias comes from my own experience practicing mindfulness-based initiatives with students when I was employed as a CLW, where I witnessed first-hand the anecdotal benefits that practicing mindfulness with children and youth

can have. These benefits included both observations, along with testimonies from students, that they were more calm and less stressed. My personal observations and the testimonies from students of these benefits are maintained by the research literature supporting mindfulness-based practices and their use with school-aged children (see section 2.3). I stayed reflexive during the research process by keeping a researcher journal and in contact with my supervisors and research team in an attempt to avoid using entirely my own perspectives to interpret participants' experiences. Considering this, I was cautious about the influences on the study caused by my familiarity with the local context.

My familiarity with the local context stems from my identification as an educated white settler scientist with English as my first language. I also grew up within 100 kilometers of the school this research took place in and have lived in the same city as said school for more than 10 years. This identity, coupled with having worked in the same school system before, afforded me cultural similarities to the participants in this study. These similarities influenced my understanding of the participants, as they used terminology and references (such as to activities) which I deemed as both rational and meaningful within our shared culture. However, I would consider myself as an outsider in terms of my position in relation to the student participants, based primarily on age and education status. As such, there are inherit limits to my understanding of grade 5 students' perceptions of practicing mindfulness, as I am a master's level student and not a grade 5 student, nor did I have the personal experience of practicing mindfulness when I was that age. As such, I may have missed colloquial understanding of that of a grade 5 student practicing mindfulness. However, my cultural similarity and having worked in the same school system before may have allowed for the study participants to feel comfortable

sharing their perceptions with me in a way they felt could best express their thoughts and feelings.

Lastly, in terms of the research process, since I was a former research assistant for a study that utilized photovoice as a method, I was already familiar with this method and had a preconception that it worked well to explore phenomenon and help people express their thoughts and feelings. Thus, the research design and execution were influenced by my previous experience as a research assistant. I may not have chosen photovoice as a research method for this study had I not already been familiar with its process from another previous study I had assisted with. I mention these attributes and aspects of myself to share my positionality with the reader. "Positionality is integral to the process of qualitative research" (p. 8, Holmes, 2020) and therefore is included here.

3.3 Epistemology and Ontology

Guided by qualitative methods, the research reported in this thesis represented an attempt to explore students' experiences of practicing a mindfulness-based initiative in school and to gain an understanding of their perceived impact of such a practice by utilizing students' own accounts (Richards & Morse, 2007). As such, this research was grounded in a social constructionist epistemology, whereby truth and meaning were not discovered but rather co-constructed through interaction (Gergen, 1999; Crotty, 1998). Through this epistemological stance, I posited that the experience of practicing mindfulness was subjective and what one can know regarding the interpretation and meaning-making of such experiences was socially constructed. Therefore, exploring such experiences was understood through the perspectives of the social actors who were participating in interpreting and producing meaning (Hesse-Biber & Leavy, 2011). The interpretations presented in this thesis were thus gained through strategies

rooted in discourse and interaction (Schwandt, 1994). In addition to this, the research was guided by a relativist ontological position, which asserts that there exist multiple realities viewed as intangible mental constructions (Berger & Luckmann, 1966; 1991), and that these realities are experientially, socially, and contextually-based (Guba & Lincoln, 1994). As such, the interpretations offered in this analysis are one possibility of many realities and truths (Denzin & Lincoln, 2005; Guba & Lincoln, 1994; Mayan, 2009).

This study did not aim to test theory or prove or disprove hypotheses; instead, the research team attempted to generate qualitative data to co-create an understanding. Consequently, a central objective of this project was to provide youth participants the opportunity to voice their unique lived experiences and perspectives through a more participant-driven, autonomous method that involves group dialogue, rather than a researcher-driven, positivist method (Finley, 2011; Strack, Magill, & McDonagh, 2004). From this perspective, I did not allude to the participants what the research question was, and kept the questions I asked of the participants open-ended and generic, with the expectation that I would co-create an understanding with the participants about their socially, mentally, and contextually constructed experiences.

3.4 Research method and approach

3.4.1 Qualitative case study

The qualitative case study approach can provide an in-depth and multi-faceted exploration of contemporary phenomenon in its real-life context (Crowe et al., 2011). An instrumental and collective case study approach was utilized for this study. An instrumental case study uses a particular ‘case’ (i.e., an individual student practicing HeartMath) to gain a broader

appreciation of a phenomenon (i.e., the perceived impacts of practicing HeartMath). A collective case study involves studying multiple cases simultaneously with the aim to generate a still broader understanding of the phenomenon (Crowe et al., 2011; Stake, 1995). Units of analysis in such types of case studies can vary from individual to group units (Yin, 2017) in which the focus of this case study was on individual participant's perceptions.

3.4.2 HeartMath practice

All students in the two classrooms engaged in a heart-focused mindfulness-based practice which followed a procedure created by The HeartMath Institute titled the Quick Coherence® Technique (HMI, 2022e; McCraty, 2017). In this practice procedure, students were instructed to 1) shift their attention to the area of their heart or the center of their chest, 2) breathe slowly and deeply, imaging the air entering and leaving through their heart area or the center of their chest, 3) remember a time when they felt good inside and to focus on this feeling as they continued to breathe through the area of their heart, and 4) try to keep that good feeling with them for as long as they could and then imagine sending that good feeling out to others.

This practice occurred once per day for five minutes in person during class time every school day for four weeks. This practice is referred to as The HeartMath Pilot Program in this thesis. The educators decided to include this practice as part of their curriculum, thus all students had the opportunity to engage in the practice even if they were not a participant in this study's data generation. The students collectively (as a class) were instructed to engage in the practice in their classrooms for a consistent dedicated 5-minute time frame following their lunch recess. The duration and dedicated time of the practice were collaboratively chosen by the community-partnered research team for the following reasons: 1) to accommodate the educators curriculum teaching schedule, 2) to provide students an opportunity to potentially enhance their self-

regulation for directed learning following their unstructured recess, and 3) one of the research questions of the quantitative study which utilized the same participant sample and HeartMath practice as this study sought to evaluate the effectiveness of the practice with a short duration. The mindfulness-based practice itself is an individualistic practice in which students were allowed to choose where they practiced within their classroom to promote comfortability and focus.

The educators were both trained in the HeartMath Resilience Advantage program by a research team member who was a certified HeartMath trainer on how to facilitate the Quick Coherence® Technique. The educators facilitated the 5-minute HeartMath practices. The educators were chosen as the facilitators as the community-partnered research team agreed that was the most feasible in terms of time and resources in the delivery of The HeartMath Pilot Program, as compared to an outside facilitator. Furthermore, a meta-analysis of mindfulness-based initiatives in school from Carsley, Khoury, and Heath (2018) indicated that mental health outcomes were significantly improved when trained teachers taught the mindfulness-based programs, unlike when such programs were delivered by an outside facilitator.

Supplementary to the Quick Coherence® Technique practice, biofeedback equipment developed by the HMI was provided to the participating classrooms by the research team which included 10 iPods (5 per class) with the HMI Inner Balance™ app downloaded on each along with earpiece biofeedback sensors. The earpiece sensor was clipped non-invasively to a participant's ear lobe to measure their HRV and display this real-time data visually on the iPods through the app. The 10 sets of biofeedback equipment were rotated daily between all students to permit equal opportunity for students to practice the Quick Coherence® Technique while viewing their HRV biofeedback information. The students were also provided with a plush teddy

bear (with a heart on its chest, see Figure 5) and an additional booklet that enclosed the aforementioned instructions of the Quick Coherence® Technique which students could take home, with the encouragement from their educators to practice at home and to share with their family members and friends.

3.4.3 Participant sample

Participant recruitment for this study was rooted in the CES approach. Given that it was the two grade 5 educators who expressed their perceived need to implement, and desire to understand the impacts of, a mindfulness-based initiative for students in their classrooms, a purposive sample (Ritchie et al., 2013) of the students in their classrooms were invited to participate. The purposive sampling approach (also termed purposeful sampling in the literature), involves selecting individuals or groups of individuals that are particularly experienced with or well-informed about a phenomenon of interest (Creswell & Plano Clark, 2018; Palinkas et al., 2015). All students in these two classrooms were learning about and experiencing practicing the HeartMath Pilot Program as part of their curriculum, thus were experienced with and knowledgeable about the phenomenon of interest, i.e., a mindfulness-based initiative in school. There are several purposive sampling methods and for this study maximum variation sampling (also known as heterogenous sampling) was chosen in order to try and maximize understanding of the research question from all available place-based angles (Etikan, Musa, & Alkassim, 2016). As such, all grade five students of the two classrooms were invited to participate.

Furthermore, in purposive sampling, the sampling unit is criterion-based (Mason 2002; Patton 2002). In this study, the sampling unit criterion was place-based since this study is informed by an ecological systems lens and the multifaceted interactions between individuals and the physical, social, and educational environments in which they are located (Kreiger, 2001).

Place-based sampling (also known as location-based sampling in the literature) identifies and selects participants from the context of interest. Thus, the two classrooms of elementary students identified by their primary educators as potentially benefiting from a mindfulness-based initiative as part of their curriculum was the place (context) of interest which the maximum variation purposive sampling was taken. The two educators of these classrooms were provided an information letter explaining the proposed research (Appendix A).

3.4.4 Participants

A total of 50 grade 5 students in a mid-sized city elementary school in Alberta, Canada were invited to participate based on a number of factors. In an attempt to address the research question with rich data, Grade 5 students were also chosen as the participant sample because children ages ~9-11 years old generally have the cognitive capacity to reflect on, express, and explain their experiences to the researcher (Eccles, 1999; Nilson, 2013; Sands et al., 2009; Sauter et al., 2010), and use operational thinking (Huitt & Hummel, 2003) in greater breadth and depth than younger students. They are also able to provide verbal assent (Burke, Abramovitch, & Zlotkin, 2005; Dockett & Perry, 2011).

In qualitative research, data saturation often determines sample size (Boddy 2016; Mayan, 2009; Saunders et al., 2018). Conceptually, saturation transpires in data analysis when no new data, insights, or information emerges and the themes, story, or theory is complete (Guest et al., 2006; Mayan, 2009). While saturation has historically been an important aspect of qualitative data generation, more recently its validity in determining sample size has been contested based on the lack of a clear and widely agreed upon operational definition as well as inconsistency in its reporting and assessment (Clarke & Braun, 2021; Fusch & Ness, 2015; Morse, Lowery, & Steury, 2014). Consequently, the rationale for the sample size chosen for this study is based on

the CES approach (described in the previous section), the chosen method (case study; Amerson, 2011), and previous research using photovoice as a data generation strategy. A sample size of 20-30 participants aligned with similar studies with school-aged children utilizing photovoice (Genuis, Willows, & Jardine, 2015; Heidelberger & Smith, 2015; Jennings & Lowe, 2014; McKernan et al., 2019; Spencer et al., 2019; Wang, 2006).

In this study, a total of 46 grade 5 students (26 girls and 20 boys) participated in the photography and journaling data generation of this study. A total of 18 of these students (12 girls and 5 boys) also participated in the subsequent online small discussion groups. The students ages ranged from 10 to 11 years old with the educators reporting little visible ethnic diversity; indicating participants were predominantly Caucasian. Based on the educator's anecdotes, there was also very little socioeconomic diversity in the participants, with the majority likely living in middle-class suburban single-family households. Participant attrition in the online discussion group was likely due to COVID-19 restrictions, as the group discussions moved to an online forum instead of in-person, at a time when use of such platforms for elementary curriculum delivery was still relatively in its in infancy. Due to the time needed to adjust to teaching their classes online, the educators and Red Deer Public School Board granted the research team approval and access to conduct the group discussion sessions online two months following the last in-class photography and journaling activity. Had the group discussions been able to occur as originally planned in person in the classroom the following week after the last photography and journal entry activity, attrition rates for the discussions would have likely been much lower.

3.4.4 Ethics

Approval to conduct this study was obtained by both the University of Alberta's Research Ethics Board as well as the Red Deer Public School District Board. Students of the two

participating classrooms were approached by the researcher in the introductory HeartMath Pilot Program session to participate. Consistent with Wang and Redwood-Jones' (2001) suggestions for photovoice ethics, participant's parental informed consent was obtained via a parent information letter and consent form (Appendix B). This consent form was sent home by the educators with the participants which was signed by the participants' parent/guardian and brought back to school by those students who participated. The educators of the two participating classrooms collected the signed consent forms back before physically and confidentially giving them to the researcher. Participants' informed assent was obtained by asking the students if they would like to take part before the project commenced (Appendix C).

The first lock-down protocols for COVID-19 were enacted after the HeartMath Program and photovoice journal data collection, and before the in-class participant discussions occurred as originally planned. Since the school's physical location was shut down, an ethics amendment was subsequently submitted and approved to host small online discussion groups instead. The school's administrative assistant sent parents or guardians of participating students an additional University of Alberta Research Ethics Board approved consent form (Appendix D) for electronical signature to obtain consent for their child to participate in an online discussion group. This electronic method of gathering consent was recommended by the education staff, as it is the modality they use for all their educational related consent forms to be signed (such as for field trips). Participant verbal assent for participation in the online discussion groups was also obtained (Appendix E).

Ethical photography, including obtaining a photo-release signed consent form (Appendix F) if participants were to take an identifiable photograph of someone outside of the participating classes, and related concerns for confidentially and consent, were discussed with the classes.

Photographs of participants within the study with parental consent and verbal assent were included in the data analysis, but no photographs of identifiable participants were included as figures in this thesis to further respect anonymity. No student took photographs of any human subject outside of the participants, and thus no photo release forms were collected.

All students in the two participating classrooms participated in the HeartMath practice, photography, and reflective journaling, as they were implemented as curriculum activities. The two educators were present when students' conducted photography and allowed for students to take a photograph once per week for four weeks during the Heart Math Pilot Program. Only those students with a returned signed parental consent form as well as provided their verbal assent had their photographs and reflective journals included in this study. Only those students with electronic parental consent and who provided their verbal assent participated in the online discussion groups and had their qualitative interview data included in this study.

3.4.5 Data generation strategies

3.4.5.1 Stages of data generation

This project's data generation strategies were developed through discussions with the university-community partnered research team about what would be appropriate for the class community. Such discussions in developing data generation strategies are consistent with recommendations by Nykiforuk and colleagues (2011) and in alignment with the CES approach. The research team, including the AHS School-Liaison, CLW for the school, the two educators of the participating classes, and I had continual communication regarding data generation. Prior to the start of data collection, the research team met to collaboratively discuss the most feasible and effective way to generate data. The AHS School-Liaison suggested that the 10 camera-capable iPod's provided for this study could be shared amongst the students to take pictures, and the

educators agreed since the students were already familiar with how to take photographs on these devices. The educators proposed Google Documents be utilized for students to write their journals as the photos could be inputted directly into the Google Document in a standardized paper-less template and the students already knew how to utilize this software from other school projects.

On the morning of the first day of the 4-week HeartMath practice, I returned for a second time to the participating classrooms during class time, this time to introduce the project to the students, why we wanted to do this study, and what we hoped to learn from doing it. Students were instructed on their roles within the project, including their ongoing assent, photography mission, reflective journal writing, and small group discussions.

The community-partnered research team met virtually after the physical school had closed due to COVID-19. This meeting discussed how the student discussion groups, that were scheduled to be hosted in-person in the school, could be carried out amidst social-distancing regulations. The educators and the researcher agreed using Google Meet to conduct online discussion groups would be the most feasible option, since that is the platform the educators used to host online classes. The educators originally proposed that two large discussions groups be hosted, one for each class, to mimic the style of the online classes. The researcher insisted that two large groups of students, especially in an online forum, would likely not be conducive to inter-participant dialogue and may not allow sufficient time for participating students to share their deeper thoughts and sentiments about their chosen photographs. Therefore, the research team came to consensus that the online discussion groups would be capped at five participants per group, to support the opportunity for unprompted yet within-scope dialogue between participants as well as allow more time for each participant to discuss their chosen photographs.

The online discussion group duration was collaboratively agreed upon by the community-partnered research team to be capped at 45 minutes duration, the typical length of one class of these students, as the discussion groups took place during the student's virtual classroom class hours. In total, four online discussion groups occurred with five participants in the first three groups and three participants in the fourth group.

3.4.5.2 Visual method (photovoice-informed photography)

During the four-week Heart Math Pilot Program, the participating students engaged with the photovoice informed visual method to document and record their experiences. Photovoice, pioneered by Wang and Burris (1996; 1997), is a participant-centered method that encourages engaging participants in the research process to provide deeper and more authentic insights into the phenomenon of focus (Baum, MacDougall, & Smith, 2006; Dick, 2011; Thiollent, 2011). Photovoice originated to provide individuals with minimal power, status, resources, or money the empowered platform to share their own experiences from their own perspectives (Wang & Burris, 1994; 1997). Understandably, the grade 5 youth participants in this study fit the description of individuals with minimal power, status, resources, or money; therefore, using a photovoice-informed data generation strategy can bolster the empowerment the participants feel to share their experiences from their own authentic perceptions (Wang, Burris, & Xiang, 1996).

Utilizing this method, participants in this study had the autonomy to take photographs of what they deemed meaningful or impactful from their experiences of practicing HeartMath, and thus were provided a platform to express their perceptions visually and independently (Jardine & James, 2014; Sutton-Brown, 2014). Butler-Kisber (2008) posits that visual inquiry can be utilized to "counteract the hegemony and linearity in [solely] written texts, to increase voice and reflexivity in the research process, and to expand the possibilities of multiple, diverse realities

and understandings" (p. 268), which aligns well with this study's methodologies. Photovoice provides a unique opportunity for students to visually portray their experiences and perceived impacts from practicing HeartMath, which could be difficult to express with words alone (Wang & Burris, 1997). Photographs offer a mode of communication that often spurs written and verbal expression (p. 44, Mayan, 2009). Furthermore, photovoice provides an opportunity for reflection (Wang & Burris, 1997). Friends and families may ask why they (the student participants) are taking pictures. Their own explanations can draw attention to discuss, teach and even solicit feedback regarding HeartMath and its perceived changes on their own and others' wellbeing. Thus, the participatory processes of photography with individual reflection, coupled with group dialogue, invites participants to "intuitively – and explicitly – reconsider their experiences and impacts that may lead to changes in their practice or changes in their attitudes towards their practice" (p. 119, Nykiforuk, Vallianatos, & Nieuwendyk, 2011) which could underscore improvements in participants' self-awareness.

Lastly, since a component of the traditional photovoice method is to reach, inform and inspire policy and decision makers, a community art gallery-style exhibition to display the students' selected photographs and journal excerpts was planned for after the study's data was analyzed and shared back with the research team. This exhibit was to provide the opportunity for students to see and feel their perspectives being valued and respected by the broader community, which could further promote feelings of empowerment (Sands et al., 2009). Unfortunately, due to COVID-19, the exhibition had to be cancelled. An online version of the exhibition was attempted to be planned by the community-partnered research team; however, it did not come to fruition due to lack of administrative support.

I encouraged participants in my introductory presentation to take at least one photograph per week over the course of the HeartMath Pilot Program, at any time during school hours as acceptable by their teachers and school staff. Students were advised that only one photograph per week could be described in their journals to accommodate for class size and time; thus, students self-selected their most meaningful photograph each week to be described and shared as part of this project's data generation. The classes involved were provided with camera-capable iPods (equipped with the HeartMath Inner Balance™ app) on them to take pictures with during school hours.

In the introduction presentation, I encouraged participants that their 'photography mission' was to take photos of places, things, people or themselves that show what their HeartMath practice is like for them, and what changes they noticed in oneself or in others from practicing HeartMath. Participants were encouraged to take pictures of 'whatever makes the most sense for them.' In sum, utilizing a photovoice informed participatory visual method was chosen to serve as a reflective tool for facilitating in-depth understandings, co-created by the participants and the research team, about the subjective and multifaceted experiences of practicing HeartMath in relation to student wellbeing.

3.4.5.3 Individual reflective journaling

Participants were provided class time to write their own reflections, thoughts, and sentiments on self-selected photographs. This activity provided students with opportunities to develop reflexive skills that are required for this type of reflective data generation method (Verdonck et al., 2019). The teachers provided class time (the duration of which was at their discretion) each week for students to describe and explain their thoughts and feelings associated with their self-selected photograph that week in a reflective journal. The journals were completed

in a secure, password protected online platform regularly used by the students, i.e., Google Documents.

In the reflective journaling process, students were provided a series of age-appropriate writing prompts they could use to reflect upon their photographs including: 1) What do you see in your photo? or What is happening in your photo? 2) Why did you take a photo of this? 3) What does this photo say about your experience practicing HeartMath? and/or 4) What does this photo say about changes in you or others from practicing HeartMath? (see Appendix G for a copy of a blank journal). These prompts were informed by the photovoice questions Wang and colleagues (2004) originated as well as inspired by Verdonck and colleagues (2019) questions utilized in their student-focused photovoice study. The two educators were present during the students' reflective journal writing and allowed for students to write in their journals once per week, usually immediately following having taken a photograph.

3.4.5.4 Online discussion groups

Photo*voice* is premised on "*v*oicing *o*ur *i*ndividual and *c*ollective *e*xperience" (p. 381, Wang & Burris, 1997). The use of photographs has been shown to facilitate dialogue amongst participants about their perceptions of the experiences under discussion through which new, different, and/or unique ideas may be generated than those heard and gathered solely from individual reflections (Darbyshire, MacDougall, & Schiller, 2005). Moreover, engaging participants in the data interpretation process is essential to collaborative-based research (Abma et al., 2019) and has the potential "for gaining a deeper, embodied, and more nuanced understanding of the research data" (p. 2, Capous-Desyllas & Bromfield, 2018).

As such, and informed by Nykiforuk, Vallianatos and Nieuwendyk (2011) recommendations, the generated themes were planned to be presented back to the participating

classes two weeks following the participants' final journal entries in a dynamic interaction session focused on collective dialogue as a form of member checking (Mayan, 2009). However, due to COVID-19 constraints, the research team and the participating education staff deemed small online discussion groups would be the best option to facilitate dialogue amongst participants given the social distancing circumstances.

The participating teachers recommended using Google Meet for the online discussion groups platform, as that is the medium they used for their online classroom teaching. I requested each group be held for one-hour, however, the teachers requested to keep the discussion groups to under one-half hour each giving the reason that it was cutting into their online instruction time. A compromise was made and the discussion groups were scheduled for 45 minutes each.

There was a notable 8-week delay between the last journal entries and the first hosted online small discussion group. Obtaining ethics amendment approval, sending out and gathering consent forms, and organizing the participating students for online discussion groups were all factors contributing to this delay further discussed in the limitations section of this thesis.

The educators scheduled the discussion groups, assigned which participants would be in which group, and invited participants to the Google Meet. However, the educators turned off their camera and microphone once the discussion began. This was done to try and reduce demand characteristics, whereby a student may alter their responses in an attempt to conform to the expectations they think their teacher has of them in such a situation (McCambridge, De Bruin, & Witton, 2012; Orne & Whitehouse, 2000), and as a compromise since I requested that the teachers not be present during the online discussions. I conducted the online discussion groups by first explaining the process and asking for participant assent, and then asking semi-structured, open-ended questions that were adapted, omitted, or elaborated on in accordance with

the individual participant and/or individual group context. Most students appeared to be alone in a room in their home while participating in an online discussion group.

During these online discussion groups, I asked participants to self-select two of their four photographs and accompanying journal reflections to discuss. Two instead of four photographs were discussed due to time constraints. Nowell and colleagues (2006) employed similar methods, acknowledging that self-selected photographs and sentiments were considered of significant importance to the participants, leading to more in-depth and critical discussions regarding their content. A semi-structured focus group format informed the process of the discussions. A copy of the script and guiding questions I used in these discussion groups can be found in Appendix H. The script and guiding questions were provided to the teachers in advance for their review and feedback. The script and guiding questions were not provided to the participants beforehand in an attempt for the focus of the discussions to be on spontaneous and authentic dialogue between participants, and not just a question-and-answer style interview between the researcher (myself) and each participant in the group.

Following the student small group discussions, I interviewed the two teachers of the participating classes in a joint online Google Meet. This was conducted ad-hoc in an attempt to provide further context to the data as the teachers were integral in the planning of the research project, lead the students in their daily HeartMath practice, as well as where present during the photography mission, journal writing, and online discussion groups.

3.4.5.5 Member checking

At the end of each discussion group, I provided students a list of themes I generated from their journals and asked for their input as a form of participant/ member checking. I provided this list of generated themes and opportunity to comment in an attempt to build a credible fit between

their (the participants') responses and my interpretation and representation of them (Nowell et al., 2017; Nykiforuk, Vallianatos, & Nieuwendyk, 2011; Tobin & Begley, 2004).

An in-person dynamic interactive session was originally planned where students would physically place their photographs under the theme they think it went with, as is regularly done in other photovoice studies (Faucher & Garner, 2015; Wang et al., 2004). However, due to COVID-19 physical distancing restrictions, the modified collaborative and participant-engaged strategy of validating preliminary themes illustrated the flexibility of the photovoice process to be contextually adaptive (Nykiforuk, Vallianatos, & Nieuwendyk, 2011). Even though I identified initial themes, the participants verified the themes to facilitate greater reliability and trustworthiness of the findings (Wang & Burris, 1997). The combination of individual visual depictions and reflective journals along with the collective theming verification process, aimed to capture both individual participants' perspectives as well as co-created collective perspectives with more authenticity and integrity (Harrison, 2002; McIntyre, 2003; Nowell et al., 2006).

3.4.5.6 Researcher memoing

During and after each online discussion group, I made field notes capturing my observations and thoughts. Data saturation was discussed with the educators, with the researcher indicating that 30 participants, of the original 46 participants, would be ideal for the online discussion groups. Transcripts were not provided back to the participants for comment or correction, as the teachers made it clear that they would not provide any more student or class time to this project after the online discussion groups. Therefore, member-checking was conducted at the end of each online discuss group, in which I requested participants to choose their top three themes from all themes I generated based on all the journal entries.

3.5 Data Analysis & Interpretation Process

All small group discussions, as well as the interview with the teachers, were video and audio recorded and transcribed verbatim by me into word processing documents. Transcribing the data was the formal beginning of familiarizing myself with the data (Riessman, 1993), and recognized as a constructionist act where meanings were created, and not simply a mechanical act of typing spoken sounds into word processing documents (Lapadat & Lindsay, 1999).

3.5.1 Thematic analysis

A PhD student in qualitative psychology was enlisted as a Research Assistant (RA) to provide their expertise and insights into the thematic analysis process. The RA signed a confidentiality agreement (Appendix I) prior to providing their guidance. Aligned with a constructionist perspective and other photovoice informed case studies, inductive thematic analysis was used to analyze all data (Braun & Clarke, 2006; Mayan, 2009; McKernan, 2016). This data analysis strategy uses descriptive labels for meaningful extracts of texts to identify, code, and categorize data into initial patterns in a circular process (Mayan, 2009; Miles & Huberman, 1994). This process of identifying, coding, categorizing as well as interpreting patterns of meaning in the data set results in themes deemed key to deepening understanding of the phenomenon under study (Daly, Kellehear, & Gliksman, 1997). These themes are highlighted as "the most salient constellations of meanings present" (p.209, Joffe, 2009) in the data corpus as interpreted by the researcher (in this context meaning myself and the RA).

Thus, themes were not identified in advance (i.e., deductive) and instead were derived from the data (i.e., inductive), boding with the constructionist paradigm in that understanding and knowledge are co-created. Analyses are interpretations by the RA and I, rejecting the notion that there must be one set of 'true' themes available to be uncovered (Denzin & Lincoln, 2005;

Guba & Lincoln, 1994; Mayan, 2009). NVivo v12 qualitative data analysis computer software and Microsoft Excel were utilized by the RA and I to aid in organizing and managing the coded data.

The RA and I followed Braun and Clarke's (2006) phases of thematic analysis. During transcription and the following manual reading of each reflective journal, preliminary analysis began by recorded our own initial thoughts, reflections, and key ideas. Following, we independently reviewed each journal to identify and provide descriptive labels to obvious components of meaningful text within the entries that expressed a participant's thought, feeling, evaluation, or association pertaining to HeartMath. Initial codes were generating by collating data extracts, which is to say, meaningful text that described reoccurring commonalities, such as persistent words, phrases, or sentiments (Faucher & Garner, 2015; Mayan, 2009; Miles & Huberman, 1994). It was these initial codes of the journals that I shared with the participants of the online discussion groups as a form of member-checking. Following, in a recursive process, the RA and I each commenced multiple reviews of the online discussion group transcripts organizing the data and collating the codes into meaningful themes and subthemes.

Theming involved collating codes by identifying if and how each of the constructs in the codes were interconnected. Throughout the analytic process, the RA and I used memoing to connect different data extracts, codes, and initial themes together so as to found broader, more generalized thematic concepts. Meaningful findings were concluded through continual self-reflection, integration of collating and theming, as well as knowledge generation (Mayan, 2009).

3.6 Trustworthiness (rigour)

One of the benefits of CES and PR-style research is rigor and quality that is bolstered by the integration of academic researchers' theoretical and methodological expertise with

nonacademic stakeholders' real-world knowledge and experiences into a reciprocally reinforcing partnership (Balazs & Morello-Frosch, 2013; Warren et al., 2018). Moreover, "any work of art–including the research report–must be understood or appreciated for what it is before it can be judged as a good or bad example of its kind" (p. 78, Sandelowski & Barroso, 2002). As such, this research did not adhere to a positivist perspective regarding the criteria for evaluating a research study's rigour, namely validity, generalizability, and reliability (Mayan, 2009). These positivist criteria are rooted in quantitative research and thus do not align with the constructionist stance of this qualitative research study. Therefore, I followed Guba and Lincoln's (1981) proposition to use trustworthiness as a more appropriate appraisal than rigour in qualitative research. I also utilized their set of criteria to evaluate the trustworthiness of the methods and analyses of this study which included credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985).

3.6.1 Credibility

Credibility assesses whether the results are an accurate representation of the participants and/or data (Lincoln & Guba, 1985) and addresses the 'fit' between participants' perspectives and my interpretation and representation of them. This study established its credibility through member-checking, on-going clarification of co-created understanding, as well as following three sets of checklists for qualitative research (Lincoln & Guba, 1985; Lincoln, 1995; Nowell et al., 2017). Member checking of the generated journal themes occurred with participants at the end of the online discussion groups. Furthermore, since it was not feasible to arrange follow-up classroom visits or online sessions throughout data analyses, due to class time restrictions as well as COVID-19 physical distancing in effect, I conducted an in-depth interview with the participating educators ad-hoc to discuss and co-create their understanding and perspectives of

the data generation strategies and preliminary findings. During the online discussion groups, I continuously clarified with, and asked for assurance from, the participants regarding my interpretation of the meaning and sentiments of their comments. Lastly, this research was guided by three checklists: 1) the COREQ: a 32-item checklist for interviews and focus groups (Tong, Sainsbury, & Craig, 2007) for conducting the online discuss groups, 2) Braun and Clarke's (2006) 15-point checklist of criteria for good thematic analysis and, 3) Nowell and their colleagues (2017) means of establishing trustworthiness during each phase of thematic analysis.

3.6.2 Transferability

Transferability, in its original meaning, evaluates the applicability of the findings to other external settings (Lincoln & Guba, 1985). Again, given the social constructionism perspective of this study in which the findings were socially and contextually-based, the transferability of these findings was addressed through the thick (i.e., detailed and in-depth) descriptions I provided of the study setting and participants. My thorough description of the social setting and context in which this research occurred allows research readers to judge whether these methods or findings would transfer to other settings or contexts (Koch, 1994; Morse, 1999). In Chapter 4 of this thesis, I discuss my insights into the transferability of the research methods and findings to future studies and implementations of mindfulness-based initiatives in a classroom setting.

3.6.3 Dependability and confirmability

To establish dependability and confirmability, throughout this thesis I strived to provide the readers with clear rationale behind the choices and decisions I made as the researcher to ascertain methodological coherence (Sandelowski, 1986). The research team and I devised a systematic method of data generation and analyses to best assure that the assumptions used in

this research study (i.e., the epistemology and ontology) were congruent with the way we generated, analyzed, interpreted, and conceptualized the data (Reicher & Taylor, 2005). Keeping my own reflexive journaling and field notes during all phases of the research project as well as engaging in researcher memoing were means I used to create a transparent audit trail (Halpren, 1983). Audit trails provide the opportunity post hoc for the reader to exam and appraise what decisions were made, how they were made, and why (Lincoln & Guba, 1985). Additionally, the reflexive and cyclical nature of the data interpretation approach and process further bolstered this study's confirmability, in that preliminary findings and themes were continually revisited and my positionality as the researcher was clearly explained. These strategies undertaken to build trustworthiness, credibility, transferability, dependability and confirmability are described in detail to aid the reader in understanding how and why I interpreted and presented the themes that I did in the following chapter.

CHAPTER 4: RESULTS

In total, 46 grade 5 students completed at least one journal entry with an accompanying photograph, 18 students participated in one of four online discussion groups, and the two educators of the two participating classes participated in one joint interview. The photographs, journals, online discussion group transcripts, and teacher interview transcripts comprise the data corpus.

Guided by Braun and Clarke's (2006) approach to thematic analysis, the RA and I conducted latent inductive thematic analysis to find repeated patterns of meaning in the data corpus. Four overarching themes, each with corresponding sub-themes, were identified: "What practicing HeartMath did for me" (including the cognitive, emotional, physical, and social impacts of the practice), "What else reminds me of the feeling of practicing HeartMath" (relationships with friends, activities, and pets), "What helps me practice HeartMath" (including the importance of having the HeartMath bear; a quiet space, and practicing with friends), and "What I use HeartMath for" (the instrumental use of the practice, including calming down/stress reduction).

4.1 Theme 1: "What practicing HeartMath did for me."

Four themes emerged from the data. The first theme interpreted from the data comprised the cognitive, emotional, physical, and social impacts of practicing HeartMath as perceived by the participants. The experience of calm was often brought up by students, discussing their experience of calm in different ways via thoughts (cognitive), feelings (emotional), body sensations (physical), as well as for positive social skills.

4.1.1 Cognitive

Students perceived the experience of calm as important for their cognitive health and functioning. Cognitive emerged as a theme used to encapsulate students' thinking patterns as a result of practicing HeartMath. Students perceived that practicing HeartMath helped their thinking patterns to be calmer, less stress-inducing, and protect against negative thought patterns.

> Participant10: Yeah, because it's like a pandemic because everyone is like scared and stressed so.
>
> Researcher: So what would HeartMath help with that? How would it help?
>
> P10: It would calm you down and relax you and just forget about the stress and all that.

> You're relaxed. You're not just stressed out or anything. Or you're just like calm and you're happy. You're not like worried about anything. (P3)

> [In response to a journal photo of themselves laughing]
>
> Question2: Why did you take a photo of this?
>
> P34: Because laughter makes me happy.
> Q3: What does this photo say about what practicing HeartMath is like for you?
>
> P34: It helps me get all the negative thoughts out of my head.

4.1.2 Emotional

Students understood the experience of calm as important for their emotional health and functioning. Emotional emerged as a theme used to encapsulate students' emotional health and functioning patterns as a result of practicing HeartMath. Students relayed that practicing HeartMath helped their emotional patterns to be less angry, more relaxed, more peaceful, and lowered feelings of stress. Participating students use of the root word calm and its synonyms

were also common descriptors for students to share what practicing HeartMath was like for them and how practicing HeartMath made them feel.

> R: So how would describe to a student in grade 2 what feeling calm is like for you?
>
> P2: Well, like before maybe you were all like stressed, or were very angry, then you would like feel relaxed and…you're not stressed anymore.

> I describe being calm is when you're not stress- when you're not acting up and you're not stressed, you're peaceful. (P11)

> I would describe it as feeling content and happy of how you feel and yourself. And you won't immediately go into, like, you won't get so mad at the smallest things. (P16)

> P11: I realized I didn't get stressed as often as I would have. And if I got angry, I wouldn't be as angry as I would actually be if I wasn't doing HeartMath.
>
> R: And did you notice anything different in the class?
>
> P11: Umm, I realized that some of the class, some of the people who would be stressed, umm, I see that they don't become as stressed as they would be.

> In me I seen that I got better at just being more relaxed and not so stressed all the time. (P7)

> HeartMath makes me calmer and I like doing it because it makes me feel calmer and makes me feel ready for the rest of the day. (P16)

> When I'm not feeling the best or something is like bothering me or whatever I just practice HeartMath and it calms me down. (P4)

4.1.3 Physical

When I asked participants what calm means, or how they would describe what calm is to a younger student, discussions of embodied feelings of calm ensued. Physical sensations in their

lungs or stomach were described, thus identifying that 'calm' was not solely an emotional feeling or mental activity for participants in this study. Furthermore, descriptors of feeling less somatically tight, around one's hands and head particularly, as well as being able to breathe deeper, were also commonly relayed by participants.

> I feel calm in my muscles like I'm just really relaxed like I'm not tense and my heart feels good. (P5)

> Researcher: Yeah. And is there a place in your body that you feel relax? Like if you could feel it in your body where would you feel it?
>
> P13: My stomach
>
> R: Yeah? And what does a relaxed stomach feel like?
>
> P13: Just light

> I think I feel [calm] mostly in my lungs. I can feel that they're less tight. I can feel that I can breathe deeper and let out more air. I can feel that I'm just not as tight in my lungs. (P16)

> R: When you're calm where can you feel it?
>
> P11: Around my heart and head.
>
> R: Your heart and head, and what does a calm heart and a calm head feel like?
>
> P11: It feels like comfort, comfort and peace.

The focus on breath and intentional breathing was a persistent subtheme in regards to how and why HeartMath is perceived to make students feel calmer. This was apparent when I asked discussion group participants what part they enjoyed the most about practicing HeartMath.

> The breathing part…Because it was just so calming and refreshing. I enjoy the breathing and I enjoy how it makes me feel calm and happy. (P14)

> HeartMath helps me be calm because of the breathing and breathing with your eyes closed. Closing my eyes while doing…the HeartMath breathing, it really makes me feel in the zone. (P11)

4.1.4 Positive social skills

Many students underscored changes in themselves they noticed from practicing HeartMath that were in relation to more positive social skills. These social skills included feeling calmer cognitively, emotionally, and somatically, as well as feeling and acting nicer than before practicing HeartMath. Less angry, short-tempered and having more skills to better equipped themselves to keep calm during an argument were positive social skills the participants relayed that they developed.

> I started noticing that I felt calmer and nicer than I did before. (P16)

> Usually I get in less arguments…I could handle some situations better than I could before…like an argument…[HeartMath] just calms me down. (P14)

> R: Did you see any changes in your classmates from practicing HeartMath?
> P10: Not really, but some people were a little bit nicer.

> P15: [HeartMath] makes you less short-tempered.
> R: And what about it, what about HeartMath, makes you less short-tempered?
> P15: The breathing.

> Well breathing it kind of calms you down. So when you do that when you're in the middle of an argument…I haven't been in an argument in a long time…because I can fix them better, in a better way. (P12)

4.2 Theme 2: "What else reminds me of the feeling of practicing HeartMath."

The second theme we interpreted from the data corpus concerned creating connections to activities or relationships that elicit the same feelings as practicing HeartMath. This included relationships with friends, and engaging in activities including art, reading, and pets.

4.2.1 Relationships with friends

Friends were frequently photographed and brought up in the discussion groups, which we interpreted as a prominent sub-theme within this study's data. Students described that the emotions produced when they were with friends were perceived to be similar to those produced when practicing HeartMath, primarily through the feeling of calm.

> My friend makes me calm and HeartMath makes me calm. (P13)

> P6: The reason I took a picture of it is because sometimes I can talk with my friends, calm down, stuff like that.
> R: And so how does that relate to HeartMath, what about that reminds you of HeartMath?
> P6: It reminds me of HeartMath by deep breaths, staying calm.

The idea of the importance of friends/friendships was also noted and commented on by one of the teachers. One teacher reflected on the students' photographing processes, noting that it seemed they were seeking out photos with people who represented true or genuine friendships, rather than just snapping a photo with someone for the sake of the project.

> Teacher1: So but lots of people wanted to take pictures of really safe people. And when they were taking pictures of their friends, to me, they were taking pictures of people that they found to be safe. Like, not just who's cool to take a picture with right now. They were crossing classes, they just seemed to be taking pictures of true friendships. From what I remember seeing anyways.

4.2.2 Activities

4.2.2.1 Art

Many students took pictures representing activities that elicited similar feelings as to when they practiced HeartMath. The most commonly referred to activities included art, reading, and/or engaging with pets. Participants expressed that the feelings produced when engaging in these activities represented similar feelings produced when they practice HeartMath. The following exchange exemplifies this emotive relationship:

> P5: I took a photo of my art [Figure 3] because art makes me really calm and relaxed.
>
> R: And how does that remind you of HeartMath?
>
> P5: Because HeartMath it helps you stay calmer and more relaxed so they're really similar.

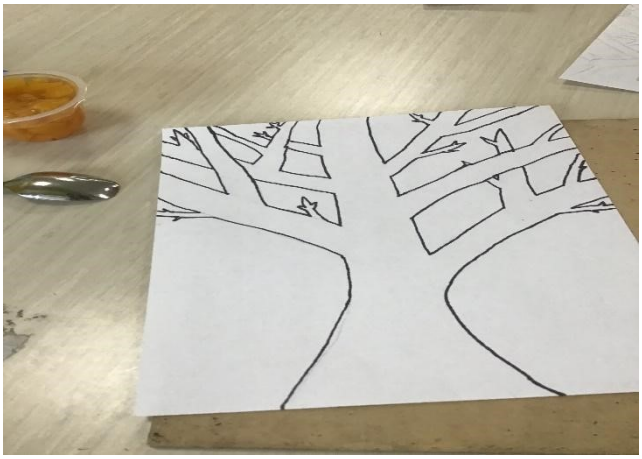

Figure 2. "Art Makes Me Really Calm"

During the interview with the teachers, they mentioned their surprise that the students' art was featured in many of their photos, which lends an interesting perspective to the student data. The teachers explained their surprised reaction was rooted in their perception that many of their students needed quite a bit of guidance and often got frustrated when it came to art class. Thus, it

was surprising to them that many participants would feature their artwork in the photovoice project. Therefore, it is important to note that while the students who photographed their artwork and described it as similar to HeartMath in that it made them feel ‘calm’ and ‘relaxed,’ the teachers’ perspective was that art class was not calm and relaxing for many students. This suggests a discrepancy between teacher and student perceptions worth noting.

> T1: Like lots of kids talked about how art was that for them, that nice thing that calms them. And it was just kind of funny because Art is one of the most triggering subjects I think that we teach. Like they love it or they melt down … How many melt downs did we have in Art?
>
> T2: Well like meltdowns and then like confirmation if they are doing it correctly.
>
> R: Oh interesting?
>
> T2: Their big thing was they were like comparing it to, like, math where you have to be right, well that’s not art. Art is whatever you want it to be. Or just giving you the direction of where you could take this and, you’re the artist. You’re the one that gets to decide what your picture looks like and they needed feedback and, “am I doing this correctly?”. Like, “Yeah, you are, it’s fine, like go for it”.

4.2.2.2 Reading

Figure 3. “Books Give me a Feeling of Calm”

Students described the similarities between reading and HeartMath including feelings of calm and ease. Both reading and HeartMath helped some students feel less stressed, worried, anxious, or upset. Focusing on the "heart feeling" generated by practicing HeartMath was also described by a student as a similar feeling they get when reading. Reading was described as calm and peaceful by some participants, which was relayed as similar to the feelings they get when practicing HeartMath.

> P17 [Journal Entry]: In the photo [Figure 3] there are books and books give me a feeling of calm and ease. HeartMath gives me a feeling of calm and ease. When I read it reminds me of the feeling I get when I really focus on the heart feeling in HeartMath. It means HeartMath for me feels the same as when I read fictional books.
>
> P17 [Online Discussion]: I took a picture of books because when I read I feel like calm and I'm not stressed or worried about anything
>
> R: And how does that relate to HeartMath
>
> P17: HeartMath is supposed to help you not worry about things and not feel stressed or anxious or upset
>
> R: Does HeartMath help you with that?
>
> P17: Yes.

> P28 [Journal Entry]: Reading makes me feel calm. Practicing HeartMath for me is calming and peaceful.

4.2.2.3 Pets

Some students took photographs of their pets or of animals to symbolize the similar feelings being around them generates as compared to the feelings generated by practicing HeartMath. Particularly the feelings of happy and calm, and being able to better concentrate on their heart, were described in participants' journals and during online discussions as related to pets and practicing HeartMath.

P2: My dog…was always happy and calm, after I practice HeartMath I always feel calm and happy.

P21 [Journal Entry] I took a photo of cats because I love cats and they help me concentrate on my heart and they make me calm. [see Figure 4].

Figure 4. “Pets”

4.3 Theme 3: “What helps me practice HeartMath.”

A concept we identified from the data is that one’s experience tends to be affected by environmental factors, and certain circumstances helped participants facilitate their practice and perceived impacts of HeartMath. The main sub-themes related to this concept that we identified included the preference for practicing: in a quiet space, with friends, and/or with their HeartMath teddy bear.

4.3.1 Quiet space

Participants described that having a physically quiet space, including that the noise levels of the room and the other people in the room be kept to a minimum, were important facets to practicing HeartMath. Students described that heavy breathing, having the biofeedback tool volume turned up, and foot tapping were distractions to being able to practice HeartMath.

Having a quiet physical space to practice was relayed by participants as an underlying factor to facilitating calmer and more peaceful practices.

> P16 [Journal Entry (font exact)]: **This photo represents the noises that people make during heart math lessons. some examples are, heavy breathing, foot tapping and TURNING THE VOLUME ALL THE WAY UP SO EVERYONE HEARS!**
>
> R [Journal Prompt]: Why did you take a photo of this?
>
> P16: Because this represents all the distractions during heart math, especially TURNING THE VOLUME ALL THE WAY UP!
>
> R: What does this photo say about what practicing HeartMath is like for you?
>
> P16: Practicing heart math is both calming and frustrating for me because it is quite most Of the time unless SOMEONE TURNS THE VOLUME ALL THE WAY UP!

> When it's quiet in the room, it helps me be calm (P18)

> R: What do you think would help you practice at home during this time if you wanted to?
>
> P7: Just kind of get into a quiet room, dim the lights, and try to take deep breaths.
>
> P6: …quiet space, because there's less distractions.

4.3.2 Practicing with friends

In light of the many mentions of friends, I asked all participating students in the online discussion groups if they would rather practice HeartMath with friends, alone, or if it depended on the circumstance; the majority of students responded that they would prefer to practice HeartMath with friends. Sentiments as to why most students would prefer to practice HeartMath with friends were primarily based on the "positive energy" felt between two people as captured in these two students' responses, "Friends because maybe, just maybe, it'll pass on, you could pass on positive energy to everyone else around you. Doing it alone, and there's no one around, you just give positive energy to yourself. But being relaxed with friends around you might

transfer some positive energy to them.", and, "It's kind of you just have company. You know they're also spreading out those good vibes, so you kind of receive those." Modelling and learning from others were mentioned by a few students, such as in this response to the question of why a student would rather practice with friends,

> P13: "[because] you can like learn from them, like you can learn from friends too.
> R: Okay, like learn about how they are doing HeartMath?
> P13: Yeah, and maybe you try out the way they're doing."

4.3.3 Having my HeartMath bear

All students in the participating two grade 5 classes received a HeartMath teddy bear as a gift. The teachers decided to have all the students get their bear prior to practicing and have their bear with them when they practiced. The bear was photographed by many students, such as in Figure 5. The Bear appears to have served as a reminder to practice and perhaps was a tangible tool to aid in focusing during the practice.

Figure 5. "HeartMath Bear"

The student who took the photograph in Figure 5 wrote in their journal, “I took a picture of the heart math teddy bear because it helps me concentrate on heart focused breathing. If I get distracted, I look at the teddy it refocuses me” and went on to explain, “This photo says a lot about developing a much more calm personality and how heart math and the Heart math teddy makes me feel calm and collected.” Summed up simply by another student, “My teddy keeps me calm.” Other students’ journal entries explained that they took a photograph of their HeartMath bear because, “I like to use it when we are practicing heart math… Because the bear is squishy and calming.” And “Well if i don’t have a heart math phone [biofeedback device] this stuffy helps me practice heart math.”

When the discussion group participants were asked if they have thought about HeartMath in the last month or two, many mentioned having their bear at home as a reminder, “Yeah, a lot of times, because every time I see my bear, my HeartMath bear.” When the groups were asked, “What do you think would help you want to or be able to practice more at home?” having the bear was also mentioned frequently, “I think if I still had…my teddy bear that I got. That would have helped.”

4.4 Theme 4: “What I use HeartMath for”

The fourth theme we interpreted from the data involved the students’ instrumental use of HeartMath to achieve specific ends, particularly calming down, reducing stress, as well as other specific instrumental uses such as aiding in falling asleep. The participants often seemed to view the use of HeartMath in terms of its utility as a means of reaching desirable wellbeing-related states or goals. It became apparent that some students were using the skills they learned from the HeartMath practice in school to address various obstacles throughout their day, and perhaps viewed it as an asset in their toolkit for managing daily stressors. Some students, for instance,

described using HeartMath mindfulness practices as a tool to transition from an uncomfortable feeling, like frustration, toward actions that would help to alleviate their struggling.

> R: And did you see any changes in you over the about a month you were practicing it?
>
> P6: I guess the time of day helped me a little bit
>
> R: How did it help you a little bit?
>
> P6: Mainly French, because I didn't like it, I was struggling, I just took deep breaths and asked for help, then I got back on track.

4.4.1 Calming down

Many of the participants who described using HeartMath in an instrumental way to change their state did so with the explicit intended outcome of 'calming down.' An intriguing aspect of this was the perceived application of practicing HeartMath in participants' lives outside of school. We interpreted that some of the participants utilized the skills garnered from the HeartMath practice to mitigate uncomfortable feelings in settings outside of their classroom, such as when doing homework, when in an argument, and related to the pandemic.

> P4: Umm sometimes when we are downstairs me and my mom will like we will practice it when you are downstairs on the couch like watching a show.
>
> R: Okay.
>
> P4: Like I don't like to watch scary shows or things that have like bad things in it, so when we do, I usually do it then
>
> R: Yeah? And how come you do it then?
>
> P4: Because then it reminds me to calm down and know that it's not all real.

> R: Okay. And [P18] when have you thought about it in the last month or two?
>
> P18: Umm, like when I don't know what to do on school work, I use it
>
> R: Yeah, and how come you use it then, or think about it then?
>
> P18: 'cause it helps me calm down 'cause if I'm frustrated
>
> R: Yeah. And about how often would you say that happens if you had to guess?
>
> P18: Umm, maybe like three times since school's been out

R: Yeah? And did you see any difference, or was there anything different about when you first started doing HeartMath to like a month after having done it?

P12: Usually I get in less arguments

R: Yeah, why do you think that is?

P12: I haven't been in an argument in a long time

R: Why do you think you get in less arguments now?

P12: Because I can fix them better, in a better way

R: How do you think HeartMath helped you with that?

P12: Like the breathing thing with all the iPods and [pause]

R: The breathing

P12: I don't have much to say

R: That's okay, I'm just curious. Like I said there's no right or wrong so I'm just being curious. And so the breathing part and you said you get in less arguments so what do you think is the, how do you think the breathing part and the less arguments, how do you think they are related?

P12: Well breathing it kind of calms you down. So when you do that when you're in the middle of an argument.

R: So someone telling you everyday, that might help you remember to do HeartMath? Do you think it would be helpful right now to be practicing it?

P10: Yeah, because it's like a pandemic because everyone is like scared and stressed so

R: So what would HeartMath help with that? How would it help?

P10: It would calm you down and relax you and just forget about the stress and all that

4.4.2 Reducing stress

Along similar lines of the idea of using HeartMath to calm down, the participants also frequently mentioned 'stress' or 'stressors,' particularly in terms of how HeartMath could be used as a tool for stress reduction. The students discussed how the practice itself is calming and that the ability to calm oneself down was perceived to be a helpful means of reducing stress, in particular that taking deep breaths led to reduced feelings of stress. Deep breaths and focusing on

being happy helped students reduce their feelings of stress, including about school work and as related to school and sport performance

R: When have you thought about HeartMath?

P2: Either when I'm like overwhelmed or stressed.

R: Yeah, and how come? How come you think about HeartMath in those times?

P2: Because HeartMath helps me calm down.

P17: I took a picture of books because when I read I feel like calm and I'm not stressed or worried about anything

R: And how does that relate to HeartMath

P17: HeartMath is supposed to help you not worry about things and not feel stressed or anxious or upset

R: Does HeartMath help you with that?

P17: Yes

R: How does it help you feel less stressed?

P17: Because it's helping you, you're taking deep breaths and you're focusing on a time you feel happy

R: And what about you over the month, was it different in the beginning than the end?

P10: Yeah I was not like stressed about a lot, and I got used to it more after we did it like every week

R: Okay, what kinds of things did it help you be less stressed about?

P10: Umm like the next school I'm going to go too, and like choosing, and like hockey, and like sports.

R: Gotcha, yeah. How did it help you be less stressed about those things?

P10: It just, when I was breathing it just liked calmed me down.

At the time of the interviews, the students were completing their schoolwork at home during the initial COVID-19 restrictions. The stress around adjusting to virtual learning and

managing their schoolwork from home came up for two of the students, and how the practice of HeartMath could be or had been helpful in terms of managing this new schooling arrangement.

> P7: Just kind of get into a quiet room, dim the lights, and try to take deep breaths
>
> R: And what do you think that would help you with? Like to do it at home right now?
>
> P7: Umm not as stressed.
>
> R: Not being as stressed, about what? What kind of things?
>
> P7: Like forgetting to turn things in online school its kind of stress

> R: Okay, so the next question is have you thought about HeartMath since you've been at home? Like in the last month or two have you thought about HeartMath since before like right now, this day?
>
> P11: Yes
>
> R: Yeah [P11] you have, when did you think about it in the last month or two?
>
> P11: I've done it twice, since like school closed
>
> R: Yeah?
>
> P11: Mmhmm
>
> R: And when were those two times?
>
> P11: Somewhere around the middle of March and I forget
>
> R: Or like what was happening that you thought to do it in those two times?
>
> P11: I just umm I got like stressed out adjusting to the new thing, of the new program, like okay,
>
> [someone in their background]: virtual learning
>
> P11: Virtual learning, okay don't go out the front door to go to school, go sit on the chair at the computer and just do school from there. That got me stressed. But then, HeartMath. I remembered HeartMath, and then I did HeartMath. And the other time I can't remember.

One student took a photo to represent an imagined future stressful situation where they might be able to apply the skills learned from HeartMath, in particular while playing hockey.

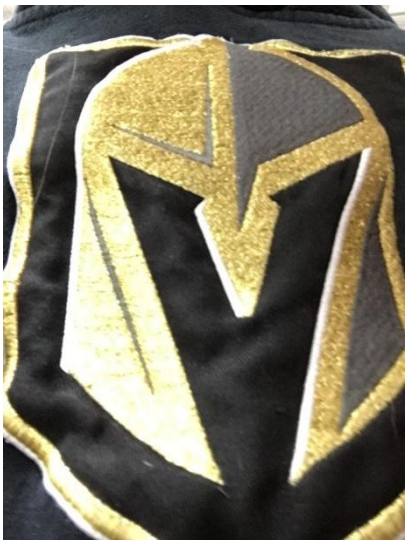

Figure 6. “Sport”

R: Week 2, and what is happening in that photo? Can you just describe it for us?

P13: Okay, so it’s my hoody, it’s Vegas Knights [Figure 6]. I picked them because I like to watch them play.

R: Okay. And why did you take a photo of that?

P13: Because they are probably the best NHL team and I like to watch them play.

R: Yeah. And so how does that relate to HeartMath

P13: When I’m playing hockey, I might use HeartMath

R: And why is that?

P13: Because I’m like a little stressed out if my equipment is there, if I’m going to score, if I’m going to get an assist, if I’m going to help out.

R: And how does HeartMath help with that?

P13: It just makes me calm.

4.4.3 Falling asleep

A less prominent, yet still notable, sub-theme regarding the instrumental use of HeartMath was in relation to aiding some students in falling asleep. This theme could perhaps be underscored by the perceived feelings of calm generated by practicing HeartMath, as well as

could be interpreted to exemplify a perceived tangential wellbeing impact of practicing HeartMath via facilitating falling asleep.

> R: Has anyone else thought about or practiced HeartMath at home? Yeah [P4] you can go
>
> P4: Yeah, I've thought about practicing HeartMath at home, when I'm like, when I can't really fall asleep, I just practice HeartMath. And sometime I practice HeartMath with my mom. And my mom, like we also have the little HeartMath unit, like we have the thing where you can still do it.

> R: So [P17] when's a time you have thought about HeartMath in the last month or two?
>
> P17: Umm, sometimes when I'm having trouble falling asleep, I try to use HeartMath to help me calm down and clear my mind.

> R: What about you [P16], when in the last month or two have you thought about [HeartMath]?
>
> P16: I've used it a couple of times too, when I'm trying to fall asleep and I can't. And it usually works. I use my special touch and I use HeartMath and I fall asleep

In their photovoice journal, one student discussed how practicing HeartMath made them feel sleepy, and this perhaps illuminates why some of the students drew a connection to using HeartMath as a tool to help them fall asleep. It could be suggested that participating in the practice in school made them feel physically calm or tired, and at a later point when unable to fall asleep they were reminded of what they perceived as the sleep-inducing qualities of the practice and were able to appropriate the practice to achieve a means of falling asleep.

Figure 7. “Sleepy Bear”

> Q1: What do you see in your photo? or What is happening in your photo?
>
> P5 Journal Response: One of the stuffys sleeping [Figure 7]. Maybe he did heart math or did some laps.
>
> Q2: Why did you take a photo of this?
>
> P5 Journal Response: Because when I do heart math I feel sleepy. I really just want to skip school and sleep when i do this!!!!
>
> Q3: What does this photo say about what practicing HeartMath is like for you?
>
> P5 Journal Response: That heart math makes me sleepy and want to go to bed. So maybe i can sleep some more.

In the interview with the teachers, they also mentioned they perceived that practicing HeartMath could be used by students as a tool for calming down after recess, helping to regroup and transition back to classwork.

> T1: It was a good time of day because it settled them when they came in. Plus it was an organizational thing too. So they all wanted to have their teddies [bear]. So when they came in from recess, grab your teddy, right, from your locker. Because we didn’t want them out on the tables all the time. And so, it was a management thing but also it was a good time to do it because it was after recess. Lots of times there’s issues at recess too so that kind of, so I just think it was kind of a good time to regroup.
>
> T2: Yep, you know and I mean, and I’m just thinking of kids that normally have problems outside at recess if they knew that they could come in and calm down during that time then I definitely I think it helped.

It appears that, to both students and teachers, HeartMath could be viewed as a means of achieving desirable states related to wellbeing such as calming down, reducing stress, or to facilitate falling asleep.

4.5 Member Checking

At the end of each discussion group, students were provided a list of generated themes from the journals as a form of member-checking to ensure accurate representation of the initial themes. The most common responses were, in order of descent: friends, calm, pets/animals, and the HeartMath Bear.

4.6 Divergent Cases

Accounts that departed from the dominated themes included the HeartMath device and physical space. Only four students mentioned the device. This could be because there were 10 iPods with the HeartMath Inner Balance™ application and associated HRV monitor for use between the two classes. Thus, more often than not, students would practice HeartMath without the use of a biofeedback device. Interestingly, the teachers mentioned in their interview that "not many and not very often" students actually declined the use of a device when it was their scheduled day to use it. The teachers proposed that this could have been due to students perceiving using the device as a distraction. The teachers also noted that some students who accepted their turn using the device, actually turned the device screen face-down so as not to view their HRV or to not have other students notice their HRV reading.

Few students mentioned physical space in relation to their HeartMath practice. A couple students mentioned they took a photograph in a certain space or room, but the main focus of their discourse was regarding an object in that room. One student mentioned that "corners", meaning a

physical corner in a room, reminds him of HeartMath because they were described as calming for him. A few other students mentioned the Sensory Room (i.e., Snoezelen Room) in their school (Botts, Hershfeldt & Christensen-Sandfort, 2008; Kalimullin, et al., 2016), but the focus of their journal entries or discussions were regarding objects in the room that were perceived as calming which reminded them of similar feelings when they practiced HeartMath. Interestingly, the teachers mentioned that some students who took a photograph of the Sensory Room had never actually utilized the room themselves before. The teachers noted this could be because of the meaning students have ascribed to why someone would use the Sensory Room, even if they do not use it themselves.

CHAPTER 5: DISCUSSION

5.1 Summary of Findings

The findings interpreted from the data in this study provided insights into student participants' perceptions of their experiences and impacts of participating in a mindfulness-based initiative in school. Four overarching themes, each with corresponding sub-themes, were identified: "What practicing HeartMath did for me" (including the experience of calm described through cognitive, emotional, and physical manifestations, primarily facilitated through mindful breathing, as well as promoting positive social skills), "What else reminds me of the feeling of practicing HeartMath" (relationships with friends, and engaging in activities including art, reading, and pets), "What helps me practice HeartMath" (including the importance of practicing in a quiet space, with friends, and/or with their HeartMath teddy bear), and "What I use HeartMath for" (the instrumental use of the practice, including calming down/stress reduction and the facilitation of falling asleep).

5.2 Interpretation of Findings

5.2.1 Impacts

The main impact students perceived they experienced from participating in a mindfulness-based initiative, specifically the HeartMath program, was an experience of calm. This experiential impact was expressed by students through perceived effects to their thoughts (cognitive), feelings (emotional), and body sensations (physical). Students described that they used the mindfulness techniques they learned through practicing HeartMath for "calming down" and "reducing stress". These findings are aligned with recent research indicating that children perceived that practicing mindfulness and participating in MBIs in schools helped them to feel

calm / to calm down and reduce their stress (Andreu, Araya-Véliz, & García-Rubio, 2021; McKeering & Hwang, 2019; Sapthiang, Van Gordon, & Shonin, 2019). Several meta-analyses of mindfulness-based initiatives in schools exist, including the study by Zenner, Herrnleben-Kurz, and Walach (2014) which reported significant improvements to students' emotional problems, stress and coping, resilience, and cognitive performance. Carsley, Khoury and Heath's (2018) meta-analyses on MBIs in schools found a small significant effect sized for all wellbeing and mental health outcomes. Schonert-Reichl and Lawlor's (2010) study on mindfulness education to grades 4 - 7 students in British Columbia, Canada, showed the most significant impacts were on improved social and emotional competence (as rated by teachers), and positive emotions (as rated by the student participants). Students in our study also described that they used the mindfulness skills learned, and/or the perceived impact of calming down from practicing mindfulness, to facilitate "falling asleep". This finding corroborates with Bothe and colleagues (2014) finding that elementary students in their HeartMath-style program utilized the skills they learned to help them fall asleep.

The students explained that from participating in this mindfulness-based initiative they perceived they were able to engage in more positive social behaviour, interpreted from sentiments such as they were able to be "nicer" to their peers and friends. This finding is aligned with McKeering and Hwang's (2019) recent systematic review of MBIs in schools with adolescence which indicated that students perceived improvements in their friendships, were able to make more friends, as well as exhibit more pro-social behaviour, proposed to be fostered primarily through improvements in self-regulation. Additionally, in a systematic review and meta-analysis by Donald and their colleagues (2019), across mindfulness types and age categories a medium effect size was found between mindfulness and prosocial behaviour. Lastly,

one of the main themes Sapthiang, Van Gordon and Shonin (2019) identified in their systematic review of qualitative school-based mindfulness intervention studies was improved social skills.

Benefits to social relationships from participating in mindfulness-based initiatives in school have also been reported in outcomes-based research. In Maynard and colleagues (2017) meta-analysis, their findings indicated that mindfulness-based initiatives in schools had a small significant effect on socio-emotional outcome of social skills. In a randomized-control trial of a mindfulness-based school program for elementary children, Schonert-Reichl and their colleagues (2015) reported improvements in students' prosocial skills (as self-reported and peer-reported), with self-reported improvements specifically in emotional control, empathy, and perspective-taking. Additionally, Bothe and colleagues (2014) found that children utilized the skills they learned in a mindfulness-based initiative in school to better handle difficulties in relationships with peers. This finding is important as positive and supportive social relationships are associated with effective coping skills, fewer mental health and behavioural concerns, higher self-esteem, enhanced academic outcomes, and better physical health in youth (Compton & Hoffman, 2019; Durlak et al., 2011), including being at less risk overall for various diseases morbidities and causes of mortality (Holt-Lunstad et al., 2017; Leigh-Hunt et al., 2017; Shor & Roelfs, 2015; Valtorta et al., 2016; Wang et al., 2018). The findings from our study indicate that students perceived practicing a mindfulness-based initiative in school impacted them by eliciting experiences of calm as well as facilitating pro-social skills.

5.2.2 Breathing as a mechanism underlying impacts

Our findings suggested that students perceived the mechanisms through which these impacts of practicing mindfulness were experiences primarily moderated by mindful breathing. A foundational skill practiced in mindfulness-based initiatives, including HeartMath, is mindful

breathing (Kabat-Zinn, 2012; 2015; HMI, 2022c). Mindful breathing is commonly utilized to anchor practitioners mind to the present moment, which has been found to have calming effects (Bernay et al., 2016; Costello & Lawler, 2014; Viafora, Mathiesen, & Unsworth, 2015).

Mindful breathing and its ability to facilitate wellbeing outcomes is also physiologically supported by RSA research (Berntson, Cacioppo, & Grossman, 2007; Grossman & Taylor, 2007). Mindful breathing techniques taught and practiced in many mindfulness-based programs, including HeartMath, are associated with improvements in one's HRV (Gevirtz, 2013), via RSA (Berntson, Cacioppo, & Grossman, 2007; Grossman & Taylor, 2007). Research on the impacts of improved RSA, and associated improvements in HRV, indicates improved emotional (Beauchaine, 2015; Tonhajzerova et al., 2016), psychological (Beauchaine & Thayer, 2015), cognitive (Overbeek, van Boxtel, & Westerink, 2014; Staton, El-Sheikh, & Buckhalt, 2009), and social functioning (Butler, Wilhelm, & Gross, 2006; Geisler et al., 2013).

5.2.3 Implementation considerations

Our findings explored students' perceived conditions that facilitated their own practice of mindfulness-based skills, including practicing in a "quiet space", "with friends", while having their "HeartMath bear". In a small-scale study exploring children's views on supporting mental health and wellbeing at a whole-school level, Hall (2010) also found that social participation was an important theme for children. To our knowledge, no peer-reviewed research has documented the essential conditions for effective mindfulness-based initiatives in schools. In Emerson and their colleagues' (2020) meta-review of MBIs in schools, they highlighted that a deficit of detail and consistency in reporting, especially in terms of implementation and feasibility studies, is a continuing challenge to developing an implementation evidence base for school-based MBIs.

The following aspects of practicing mindfulness seem to be more important for future practice implementation considerations than it is to practice mindfulness-based skills with a biofeedback tool. These aspects include practicing with friends, the physical environment being quiet, and having a physical token that is associated with practicing and thus can remind them to practice. This suggestion is corroborated by an ad-hoc interview I conducted with the educators about the process of the study during which they described that the students were not overly motivated to practice by the biofeedback device as they originally thought they would be, given the technological and game-based nature of the device. Analysis of the students' accounts corroborated with the educators' anecdotes as only two participants mentioned the biofeedback device in the focus groups discussion. This is aligned with Masteller, Sirard and Freedson's (2017) study on children's perceptions of a physical activity device tracker in which they found youth in their study described the social aspects of the initiative as more important to eliciting their participation than the use of the physical activity biofeedback device. Thus, consideration for future implementations of mindfulness-based initiatives in schools should emphasize the social aspects of the initiative more so than the biofeedback tools, given my interpretations of the findings of this study.

There is a deficit of research exploring the effects practicing mindfulness with friends has on both engagement and outcomes. Implications of these findings are that efforts to improve student wellbeing through mindfulness-based initiatives in schools should consider garnering students' voices and context-specific understanding of the conditions which are important for optimal implementation. Our findings indicated that physical and social environments are important aspects to students when participating in a wellbeing initiative in schools. This is aligned with the physical and social environment components of the CSH framework (JCSH,

2022). Schools wanting to optimize the wellbeing experiences of calm and positive social skills for their students may benefit from supporting mindfulness-based initiatives, with a focus on practicing in a quiet space, with friends, and/or while holding a physical comforting token, such as a special teddy bear.

5.3 Study Significance and Implications

Mindfulness research with children in schools has predominately focused on outcomes. There is a deficit of qualitative research on this topic which explores students' perceptions of the impacts of practicing, especially in Canada. By exploring how children think, feel, and reflect upon the impacts of participating in a mindfulness-based initiative in school can lead to insights on how to improve the delivery and implementation of such initiatives. Our study adds knowledge to the gap in the literature on student-oriented qualitative explorations of mindfulness-based initiatives in schools in Canada.

A key implication based on the accounts of the students involved in this study were that mindfulness-based initiatives practiced in schools can have perceived positive impacts to their wellbeing. Our findings provided considerations for future implementation in the school setting. The community-based research team summarized the most relevant highlights from the literature review and the initial findings to create summary documents called BLAMs (Bottom-Line Actionable Messages). These documents were written principally for policy and practice audiences. In addition, the quantitative research team created a policy brief proposing a set of in-school evaluation recommendations for senior administrative school leaders, which included an integrated executive report collating both literature review synopses with the quantitative evidence along with the initial qualitative themes of the HeartMath Pilot Program.

CHAPTER 6: CONCLUSIONS

6.1 Strengths

The use of a participatory-oriented qualitative approach was a strength of this research, as it allowed for personal, organic, and detailed exploration into the perspectives of students practicing a mindfulness-based initiative in the classroom. Learning from the voices of the students in this study, we gained an understanding that the salient impacts of practicing mindfulness to them were associated experiences of calm and improvements in their pro-social skills. We also learned that practicing in a quiet space, with friends, and/or while having their HeartMath teddy bear were important conditions facilitating their practice and eliciting their perceived positive impacts. Exploring and understanding student perspectives are important to consider when implementing wellbeing promotion initiatives in schools, as their insights can help tailor the initiative content and delivery to better meet their needs (Ofosu, 2019).

While the mindfulness-based initiative implemented in this study did not take a CSH approach, our study did incorporate a couple of the essential conditions for implementing a CSH approach in Canada recommended by Neely, Montemurro, and Storey (2020). The conditions incorporated were to have "more emphasis on students' voice" and "collect data that is context-specific and meaningful to the school" (p.7). By utilizing a qualitative participatory-orientated methodological approach of photovoice, students' perceptions were the predominant focus of this study. Additionally, in rooting our study in CES by working collaboratively with the educators and members of the community-based research team, we collected data that were context specific and meaningful to the team and school/classroom context (Meurer & Diehr, 2012). In addition, The HeartMath Pilot Program paralleled, on a smaller scale, the universal approach of CSH in that it aimed to promote wellbeing in all students in the participating

classrooms, rather than targeting only those students identified as having, or at-risk of, mental health concerns.

Educators in this setting can utilize the findings of this research to inform future implementation of mindfulness-based initiatives in their school. Since the educators were integral in the delivery of the mindfulness-based program and in the photovoice photography and journaling, as well as data collection, the initiative's implementation and data collection fidelity were consistent.

6.2 Limitations

In regards to the literature review, most of the research conducted on HeartMath specifically, was conducted by the Heart Math Institute (HMI) or its researchers. In the literature review for this thesis, there was relatively scarce studies examining the HeartMath system in particular, including its biofeedback tools, as compared to research on mindfulness initiatives. The studies that did examine the HeartMath system explicitly were largely conducted by the HMI including its researchers which introduces bias as HMI has a vested interest that its process, techniques, and technology are shown to be beneficial. Furthermore, the participant journal prompts and focus group questions used reference HeartMath and not mindfulness which may have limited participants to discussing only their experience with HeartMath as a program and not mindfulness-based programs in general. Perhaps students would have had more or different aspects to bring forth in their journals and focus group discussions had the terminology referenced mindfulness more broadly, depending on their past experiences with mindfulness-based programs.

6.2.1 Limitations of data generation

The educators deemed it necessary to schedule when students could take photographs and journal so as to limit the disruptions to curriculum teaching. Limitations of this scheduled approach included that if a student was absent the day the teachers scheduled the opportunity to take photographs and journal, that participant did not have any data generated that week. Conducting research studies in schools during class time poses such a constraint, whereas photovoice studies that provide each participant with their own camera and the ability to take photographs when they choose and reflectively write about those photographs when they choose could generate more data, or more genuine data. On one hand, students were aware of when this photography and journal writing time was, as reflected in their classroom schedule, and thus could have provided them with the motivation to think about what they would photograph and dedicate time to reflect on what they wished to photograph. On the other hand, this regimented schedule limited spontaneous data generation that could have been more genuine if a participant had a natural, unprompted thought or motive to photograph something and reflect on it in that moment.

The educators anecdotally described to the other members of the community-partnered research team that their classroom of students, including the participating group of students, were not a relatively strong group of writers as compared to students they have had in previous years. They cited that their classes had recently completed a three-month writing curriculum, at the end of which many of the students were still not elaborate writers. The lack of length and apparent depth in the journal responses could be indicative of the age of the participants as well. On average, students wrote one sentence or sentiment for each journal prompt. The research team at the time was not overtly concerned about the amount of writing in the journals, as they were

meant as prompts to be utilized to elicit more data generation during the discussion groups as is typical in photovoice methods (Wang & Burris, 1994; 1997).

The COVID-19 pandemic first closed down schools the Monday following the last day of photo taking and journal writing. Given the uncertainty of that first lock-down, the initial transition to online classroom learning, and the educators acting as gate-keepers to engaging with the students, discussion groups 1) had to occur online and not in-person as originally planned, and 2) occurred eight weeks post initiative, in which originally the discussion groups were planned to occur one week post initiative. Perhaps richer and more in-depth data would have been recalled or shared by the participants if the discussion groups had occurred in person and shortly after the last photography and journaling activity.

The in-class member-checking activity also had to be adapted to the online format. If member-checking could have occurred in-class, perhaps more class dialogue and discussion could have been generated allowing for a more thorough member-checking. Participants were still relatively new to online classroom settings, where the flow of conversation is typically unilateral, that is, from the educator to the students. Perhaps if the discussions could have occurred in-person, inter-participant dialogue could have incurred more since bidirectional conversations are more common in the physical classroom for these students, as mentioned by the educators in their interview. However, in attempts to mitigate this, the educators grouped students together for online discussions on the basis of who they thought would talk to each other more, based on their observed natural social habits when in the physical classroom.

Lastly, the sample was not randomly selected nor a representation of the population; as such, the findings of this study are not generalizable. Based on the postal code of the school in this study, my perception and assumption are that the students of this school were primarily from

middle-class families. Thus, there are limitations of that perspective. How a middle-class student perceives practicing mindfulness could be different as compared to students of lower or higher socioeconomic statuses. Participation was also less than half in the online discussion groups than the photographing/journaling data generation (18 out of 46 participants). This could have been due to the time-lapse between the in-school HeartMath program and the online discussions, the parents or students being preoccupied with other priorities (perhaps related to COVID-19), and/or a lack of motivation to participate since these online discussion groups were extra-curricular to their regular online classes, as regulated by the educators. In school, the students were provided class time to take photos and write in their journals, and was a part of their curriculum learning, aiding in the higher participation rate during that phase of data generation. If in-person discussion groups could have been held during curriculum teaching time, it is probable that the participation rate in the discussion groups would have been higher.

6.2.2 Limitations of data analysis

Ideally, data analysis and the interpretation process take place concurrently with data generation in qualitative research studies (Mayan, 2009). The intention is that the researcher can follow up with participants on preliminary themes, interesting side comments or conflicting patterns that are interpreted from initial data generation strategies, thus building on and enriching the data corpus via subsequent data generation strategies. In this study, some member-checking was able to occur during the online discussion groups. However, due to the overwhelmed school system, the School Board and educators declined to continue the study. Based on online curriculum time restrictions, follow-up individual interviews after the group discussions were not conducted, which may have elicited further understanding and insights from the participants.

6.3 Recommendations for Practice

It is important to consider when implementing mindfulness-based programs in schools that they can be viewed by teachers and school staff as yet another 'add-on' in a busy and often over-burdened school environment (Bentsen et al., 2020). Therefore, we implemented a mindfulness-based initiative, the HeartMath Pilot Program, to focus on being an 'add-in' approach in which the "health promoting activities become part of curriculum-based educational activities without taking time away from core curriculum obligations" (as opposed to 'add-on' activities which are "applied on top of the core curriculum obligations as something extra during both classroom teaching and school management)" (p.e71). The School Mental Health Ontario 2019-2022 Action Plan put forth a Tier One Strategy Area as "evidence-based social-emotional development programming as part of regular classroom life" (p. 2, 2018). Such 'add-in' approaches emphasize interdisciplinary teaching and learning as well as reorganizing available resources while mobilizing additional resources in order to expand the scope of wellbeing promoting initiatives in schools. The mindfulness-based program we implemented for this study was developed and delivered collaboratively with the educators of the participating classrooms, and aligned with the 'add-in' approach; however, it was only for a finite amount of time and did not include the whole school or school learning environment in its implementation. The reason for this was because this study is rooted in Community-Engaged Scholarship (Ahmed & Palermo 2010; Boyer, 1996; Bringle & Hatcher, 2002; Fitzgerald et al., 2019), and was developed and delivered collaboratively as a classroom pilot program to address the local and contextual needs of the school partners.

Mindfulness-based initiatives in schools, such as the HeartMath Pilot Program in this study, tend to be implemented as a pre-determined or manualized intervention designed to be

delivered in discrete contexts (such as for limited amounts of time in certain classrooms), rather than as school-based mindfulness initiative integrated into the school ethos and supported systemically throughout the school learning environment (McKeering & Hwang, 2019; Carsley, Khoury, & Heath, 2018; Mendelson et al. 2010). Considering youths' declining wellbeing is a multicomponent system-initiated problem, a microsystem level / individual focused initiative is not going to holistically address wellbeing concerns in children. Which could underpin why mindfulness-based initiatives in schools tend to show small (Felver et al., 2016) to moderate (Carsley, Khoury, & Heath, 2018) effect sizes. Given the nationally and internationally recognized demonstrated success of the CSH approach (JCSH, 2022; Langford et al., 2015), mindfulness-based programs in school may demonstrate more effectiveness if delivered within a CSH approach. In order for a mindfulness-based initiative to be delivered within a CSH approach, it must prioritize its implementation across four components: social and physical environments, teaching and learning, policy, as well as partnerships and services (JCSH, 2022). Additionally, it should meet the essential core, contextual, and process conditions of CSH implementation (Storey et al., 2016). Ideally, "Authentic Family Partnerships" and "Aligned Community Partnerships", which are indicators of schoolwide SEL as well as important tenants of CSH, would be involved collaboratively in the implementation planning of future practices (CASEL, 2022b). School-based wellbeing promotion initiatives using a CSH approach are likely to be implemented with high quality (Payne & Eckert, 2010) as well as be sustainable (Leadbeater, Gladstone, & Sukhawathanakul, 2015).

6.4 Recommendations for Future Research

Based on our research and findings from this thesis, recommendations for future research were elicited. At the program level in schools, future studies could consider utilizing verbal

journals instead of written journals in an attempt to generate richer and more-in depth detail of their photographs. Additionally, allowing students to take pictures at home and in community-based settings could further broaden contextual insights. I proposed this option to the community-partnered research team, as this study was conducted in a school of relatively high socioeconomic status in which most had private access to devices with camera-capabilities. I was especially interested in implications of mindfulness-based practices learned in the classroom and the translation to home and community-based environments, particularly during the initial COVID-19 restrictions. Other research has demonstrated the importance of the school and home relationship in promoting health behaviours in students (Bird, 2020; McKernan, 2016), as children's health behaviours are influenced by multiple environments, individuals, and locations (Langford et al., 2014; 2015). However, the School Board did not accept this proposal for future research, citing COVID-19 constraints and concerns over "adding more to teachers, parents or students' plates" during the first several months of the pandemic.

Following, qualitative and quantitative evaluations of mindfulness-based initiatives implemented through a CSH approach, including student, teacher, parent, and education administrator participants, are needed to more comprehensively understand the effectiveness of such initiatives on students' wellbeing. Utilizing a CSH approach has been shown to be effective in promoting student health but future research is needed evaluating school-based wellbeing initiatives utilizing a CSH approach. Additionally, mindfulness-based initiatives in school have been shown to be effective for promoting wellbeing in students, yet there is a deficit of research exploring students' perceived experiences and impacts of practicing a mindfulness-based initiative in schools, especially in Canada. Such qualitative research could provide valuable considerations for implementing school-based mindfulness-based initiatives through a CSH

framework in ways which are contextually-conducive to promoting children's wellbeing. Evaluations of this nature can support public health and education policy and decision makers in directing resources towards holistic implementation of school-based wellbeing initiatives. It would be important that additional research identify the long-term effectiveness and sustainability of school-based wellbeing promotion to aid in justifying the resources deployed to CSH initiatives.

6.5 Conclusion

Systemic, contextual, and individual factors impact students' wellbeing. Mindfulness-based initiatives in school are perceived by children to impact aspects of their wellbeing in positive ways. Classroom level initiatives such as this address only one aspect of their wellbeing; thus, contextual environmental support is also warranted to promote student wellbeing in the school learning environment. As such, health promotion initiatives which address multicomponent aspects of the ecological system, from individual-level skills and behaviours to environmental influences are important to supporting wellbeing in children and youth.

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APPENDIX A: Teacher Information Letter

TEACHER INFORMATION LETTER

Study Title: Student Perceptions of the Social-Emotional Wellbeing and Mental Health Impacts of Practicing HeartMath: A Photovoice Informed Case Study.

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Dear Teachers,

On behalf of our research team at the University of Alberta, Lisa Armstrong (MSc student) and her supervisor Dr. Jane Springett (Professor, School of Public Health), in collaboration with Denise Fredeen (Alberta Health Services) and Brooklyn Moe (Community Liaison Worker), we would like to sincerely thank you for your participation in this qualitative inquiry of students' perceptions of practicing HeartMath.

We greatly appreciate the generous dedication of your time and effort to the success of this project. HeartMath provides innovative and effective ways to assist children in regulating their emotions. We hope to gain new understandings and insights into how students themselves perceive practicing HeartMath impacts their own, and their peers', Social-Emotional Wellbeing (SEW) and mental health. This study will provide the opportunity for your students to share their own perspectives about their experiences and learnings of practicing HeartMath through photovoice (students taking photographs to show how HeartMath has impacted them, then journaling and discussing what their photos mean). Perhaps the children in your class could use this activity as English and/or art project. The research team will organize a gallery of the students' work to display. We are grateful for your warm welcome of our research team into your classroom.

This study will be reviewed and receive ethics clearance through the University of Alberta's Research Ethics Board (REB1) before we can visit your classroom to collect any information from students. If you have any questions or concerns regarding participants' rights and ethical conduct of the study, you may contact the Research Ethics Office at (780)-492-0459 or by email at reoffice@ualberta.ca

Consent forms for the parents will be provided to you and will be required to be distributed amongst your grade five students to take home. This will provide parents with the opportunity to decide whether they wish for their child to participate in the photography, reflective journaling, group dialogue activities and the art gallery portions of this study. Please have parent consent forms returned by February 3rd, 2020 so the research team can collect them in the first classroom visit that week. While children without parental consent can still participate in the HeartMath practices in class, and can still take photographs and journal if they wish, their data will not be included in the study.

In early February, on a date and time that works best for you and your classes, we will come in to explain to your students their "photography mission", the reflective journaling activity, the group dialogue activity and the art gallery exhibition. Following, for the next 4 weeks please consistently practice the HeartMath Heart Lock-In practice (5 minutes a day, 5 days a week) until our final follow-up visit by mid-March 2020. At this time, we will collect all photographs and journal reflections for analyzing.

Please note that any data obtained will be kept confidential, no identifying or personal information will be disclosed, and all information will be examined in aggregate (group) form. The study is adhering to the security procedures of the University of Alberta's Research Ethics Board guidelines to ensure anonymity and confidentiality of all information obtained. Your students will have the opportunity to withdraw from the research at any time without consequence.

The overall and de-identified findings of this study will be used to support Lisa's Master of Science thesis and may be used for publication and sharing at conferences. An art-gallery style exhibition that will likely take place at Don Campbell Elementary in May 2020. Our team will follow up with you to schedule and plan the gallery collaboratively with you.

If you have any questions regarding the study or if we can provide any additional clarification, please contact Lisa Armstrong or her supervisor Dr. Jane Springett. Thank you again for your participation and for your contribution to this project. We are confident that it will be a rewarding experience for all involved. We are excited about this collaborative opportunity and look forward to working with you and your students.

Sincere Thanks,

Lisa Armstrong
Dr. Jane Springett

APPENDIX B: Parent Information Letter and Consent Form

PARENT INFORMATION LETTER and CONSENT FORM

Study Title: Student Perceptions of the Social-Emotional Wellbeing and Mental Health Impacts of Practicing HeartMath: A Photovoice Informed Case Study.

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Dear Parents,

Our research team would like to invite your child to take part in a photography and journal writing study on the HeartMath practices that will be happening in your child's classroom in February and March 2020. Lisa Armstrong is a MSc student at the University of Alberta she is part of a research team that includes her supervisor Dr. Jane Springett (Professor, School of Public health) as well as Brooklyn Moe (Don Campbell's Community Liaison Worker) and Denise Fredeen (Health Promotion Facilitator, Alberta Health Services).

Background

- HeartMath helps people learn skills to cope with their emotions. We hope to learn what students think about practicing HeartMath and how practicing it may change their own, and their peers', Social-Emotional Wellbeing (SEW) and mental health.
- The findings of this study will be used in support of my (Lisa's) Master of Science thesis.
- Before you make a decision, one of the teachers or the researchers can go over this form with you. Please ask questions if you feel anything needs to be made clearer. You will be given a copy of this form for your records.

Purpose

- We want to do this study to give your child the chance to share their own thoughts and feelings about practicing HeartMath through something called photovoice (students taking photographs to show what they think practicing HeartMath has done for them, then journaling and talking about what their photos mean).
- The information provided by your child will be used to help Red Deer Public Schools and Alberta Health Services in their efforts to improve classroom learning and social-emotional skills for students. For this project, students will get to do a 5-minute HeartMath practice lead by their teachers twice-per-day, every school day, for four-weeks between February 7 and March 13, 2020.

Study Procedures

HeartMath Practice

- For this study, your child will get to do a 5-minute HeartMath practice lead by their teachers twice-per-day, every school day, for four-weeks between February 7 and March 13, 2020.
- The 5 minutes HeartMath practice that will be used is called the Heart-lock-in method is very simple and has three stages:
    - Children will focus attention on their heart or chest area and breathe in and out of the area of the heart a bit slower and deeper than usual.
    - Children will then be guided to try to feel a positive emotion such as care for someone they love or someone who loves them, gratitude, pride, or joy.
    - Finally, they will be guided to send the positive feelings (e.g., love, pride, joy) to their entire body (to themselves first) and then to send that feeling outwards to their loved ones, classmates, or even the entire world (in all directions).

Photovoice (Photos & Journaling)

- During these four-weeks, your child will get to take at least one photograph per week during class time using the iPods with cameras provided that have the HeartMath program on them. At least 10 minutes of class time per week will be given to your child to be able to take a photo.
- Your child can take photos of places, things, people or themselves that shows what their HeartMath practice is like for them, and what changes they have noticed in them self or others from practicing HeartMath.
- All students will be taught about ethical photography and to use photo-consent forms if they want to take any photos that have someone's face or any other way to tell who is in the photo.
- All photos and journals will be kept private and nameless. If you and your child want though, your child can take part in an art-gallery in May at Don Campbell School where they can choose a photo they took and a journal caption to display. You and your child can choose if you want your child's name under their photograph or not at the art-gallery.
- Students that take part will get at least 10 minutes of class time each week to write about what their photo that week means to them in journals.
- Which child takes which photo and writes which journal will not be told to the research assistants that will look for patterns or themes across them.
- These themes will be brought back to the students that are taking part in this study in a group class activity where students can place their own photos and journals under which themes they think they go with, or create new themes if they want.
- Your child will get printed copies of their chosen photos and will get to keep their journal reflections if you and them want in April 2020.
- In May 2020, an art gallery at Don Campbell will be hosted to share overall findings and give the children that took part the chance to display their photos and captions from their journals.
- Parents, teachers, Red Deer Public School District Staff and Alberta Health Services staff will be invited to attend. Once this event is set, an invitation will be sent out in hopes you can attend.

Benefits

- Your child may benefit from practicing HeartMath Heart-Lock-In method over the four-week time span by feeling positive changes in Social Emotional Wellbeing and mental health.
- Your child may improve their photography and reflective writing skills by taking part in this study.
- Your child may feel an increased sense of empowerment and confidence, as they get to see their thoughts being valued and respected by their community, especially by taking part in the art gallery.

Risk

- There are no anticipated risks to your child to take part in this project. If your child experiences any unwanted feeling for any reason by taking part in this study, the CLW and your child's teacher will be there to provide them support.

It is up to you if you want your child to take part

- Please note that it is 100% up to you and your child to decide if you would like your child to take part in this study.
- If for any reason you do not want your child to take part in this study, you may say no, or you may say yes now and then say you do not want them taking part, or want their data taken out of the findings at any time up until March 16, 2020, without any cost or penalty of any kind to you or to your child.
- In the event you change your mind and wish to opt your child out of the study, any photos and journals your child created will be given back to your child and any copies the researchers have will be destroyed.
- Your child will continue to practice HeartMath in the classroom as it is a teacher-lead classroom activity.

Information will be kept private and nameless

- If you consent to your child taking part in this study, your child's photos and journals will be kept private and confidential, and no names will be on photos or journals. You and your child may consent to have your child's name as the author of a chosen photo and journal caption at the art gallery if you and them want though.
- All the photos and journals will remain anonymous and confidential and only the people on the research team will see them.
- In the group class activity where your child will get the chance to sort their photos and journals into themes, if your child chooses to take part in this sorting activity, only their classmates and teachers will know which photographs they took and journals they wrote.
- Overall (group) and anonymous findings will be used in support of my (Lisa's) Master of Science thesis as well as may be used in research journals and talked about at conferences (e.g., the University of Alberta's School of Public Health Week). Your child will *not* be identified in any of these.
- Your child's teacher (Mrs. McLean or Mr. Christensen) and Brooklyn Moe (CLW) will give your child a study ID number. Only they will know which study ID number belongs to which student.
- Only Lisa and Dr. Springett will have access to the anonymous digital photograph files and journals. We will not know which student is the author of which photo/journal, as we will only know study ID numbers (but not who those study ID numbers are assigned to).

- The local Research Assistants from Red Deer College that we hire will have to sign a contract stating that they will keep all information private, and they will only have access to journals without names on them.
- This data with no names will be stored on a password protected computer for 5 years and then destroyed (as required by the Research Ethics Office). Only Lisa will have the password to this computer. This computer will be locked securely in Lisa's office.

Contact Information

- If you have any questions or concerns about this study, please contact the researcher(s) Lisa Armstrong or her supervisor Dr. Jane Springett.
- The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. If you have questions about your rights or how research should be conducted, you can call (780) 492-2615. This office is independent of the researchers.

Thank you very much for your time and thinking about your child taking part in this study.

Please fill out the last page if you would like your child to take part in this study

Please sign this sheet and **return it** with your child to their teacher by **Monday, February 3, 2020.**

By signing below, you are consenting to the use of your child's photographs and journal entries as outlined above.

Please check the box next the permissions you would like to provide:

- ❑ I **agree** to allow my child to take part in the photography portion of the project.
- ❑ I **agree** to allow my child to take part in the journaling portion of the project.
- ❑ I **agree** to allow my child to take part in the group class activity of overall themes portion of the project.
- ❑ I **agree** to allow my child to take part in the art gallery portion of the project.
- ❑ I **agree** to allow my child to be known as the author of their displayed photograph and journal caption in the art gallery portion of the project.

Consent Statement

I have read this form and the research study has been explained to me. I have been given the chance to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree for my child to take part in the research study as talked about above and will get a copy of this consent form after I sign it.

I _____ [Print parent or legal guardian name], give permission

for _____ [Print child's name] to take part in the project described in this form.

_____ _____

Parent or Legal Guardian's Signature Date

APPENDIX C: Participant Assent

ASSENT FOR CHILDREN

Study Title: Student Perceptions of the Social-Emotional Wellbeing and Mental Health Impacts of Practicing HeartMath: A Photovoice Informed Case Study.

Research Investigator:
Lisa Armstrong
3-300 Edmonton Clinic Health Academy
11405 – 87 Ave
Edmonton, Alberta, T6G 1C9
(403) 358-2549
Lisa.Armstrong@ualberta.ca

Supervisor:
Dr. Jane Springett
3-035 Edmonton Clinic Health Academy
11405 – 87 Ave
Edmonton, Alberta, T6G 1C9
(780) 492-0289
Jane.Springett@ualberta.ca

We want to tell you about a research study we are doing. A research study is a way to learn more about something. We would like to find out more about what you think about practicing HeartMath. This will help us know if you think practicing HeartMath is helpful for your feelings, your friendships and your mental health. You are being asked to join the study because your teachers and Mrs. Moe want to give you the chance to have your thoughts and feelings heard about your HeartMath practice happening in class.

If you agree to join this study, you will be asked to take pictures with the iPods that have the HeartMath app on them. You can take one picture a week for the next four weeks of anything that you think shows us the changes you feel may be happening to you or your classmates from practicing HeartMath.

Your teachers will give you some class time each week to write about what your photo that week means to you in your own journal.

After four weeks of taking pictures and journaling, some of our helpers and I will look for patterns across all of the journals. These helpers and I will bring back these patterns or themes to you for a fun class activity where you can sort your pictures and photographs under which theme you want them to go with, or make up new themes.

Then, sometime in May, if you want to, you can display one of your photographs and a bit of your journal about it in an art-gallery here at the School that you can invite your friends and family to.

We think this study will help you learn more about what practicing HeartMath does for you and your classmates. We don't think there are any discomforts that will happen to you by taking part in this study. What you think will help us and others know more about practicing HeartMath with other students in other classes.

You do not have to join this study. It is up to you. You can say okay now and change your mind later. All you have to do is tell us you want to stop. No one will be mad at you if you don't want to be in the study or if you join the study and change your mind later and stop.

Before you say **yes or no** to being in this study, we will answer any questions you have. If you join the study, you can ask questions at any time. Just tell your teacher, Mrs. Moe, any of the researchers that you have a question.

If you have any questions about this study please feel free to contact Lisa Armstrong at (403) 358-2549

☐ Yes, I will be in this research study. ☐ No, I don't want to do this.

Child's name	Signature	Date

Person obtaining Assent	Signature	Date

APPENDIX D: Electronic Parental Informed Consent for Online Discussions

PARENT CONSENT FORM - HeartMath: A Photovoice Informed Case Study

STUDY TITLE:
Student Perceptions of the Social-Emotional Wellbeing and Mental Health Impacts of Practicing HeartMath: A Photovoice Informed Case Study.

Research Investigator:
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Supervisor:
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Edmonton, Alberta, T6G
1C9 (780) 492-0289
Jane.Springett@ualberta.ca

INFORMATION:

Students in grade five were involved in a photography and journal writing study along with a research team, based on the HeartMath practices that occurred in their classrooms during the months of February and March. The Research Team consists of Lisa Armstrong, MSc student at the University of Alberta; Dr. Jane Springett, Professor, School of Public Health; Mrs. Brooklyn Moe, DCE Community Liaison; and Denise Fredeen, Health Promotion Facilitator AHS.

Due to the COVID-19 Pandemic and the closure of schools, the group class activity had to be postponed. In practicing social distancing, the research team would like to invite your child to take part in an online video-chat version of the group class activity, where students can discuss with each other about the photos they took, what they wrote in their journals about their photos and the overall theme that came out of the students' journal entries.
This small online group discussion, similar to a focus group, will be hosted by Mr. Christensen and Ms. Lisa Armstrong through Google Meet. The discussion will be audio-recorded so that the researchers can transcribe the audio into a word document to include in the data analysis to discover themes.

Information will be kept private and nameless

- If you consent to your child taking part in an online voice-recorded small group discussion, like a focus group, your child's dialogue will be kept private and confidential, and no names will be disclosed in the transcription.
- All the audio and transcriptions will remain anonymous and confidential and only the people on the research team will hear/see them.
- Overall (group) and anonymous findings will be used in support of Ms. Lisa Armstrong's, MSc thesis, as well as may be used in research journals and talked about at conferences (i.e.; the University of Alberta's School of Public Health Week). Your child **will not** be identified in any of these.

Student/Parent Information

STUDENT, LAST Name

{Student.LastName}

STUDENT, FIRST Name

{Student.FirstName}

PARENT, LAST Name

PARENT, FIRST Name

Parent/Guardian EMAIL ADDRESS

Parent/Guardian CONTACT Primary Number

CONSENT

CONSENT STATEMENT

I have read this form and the research study has been explained to me. I have been given the chance to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree for my child to participate in the research study as talked about above and will receive confirmation of this consent after I sign it.

- **I give permission for my child to take part in the online part of this project as described in this form.**
- **I agree to allow my child to participate in the online audio-recorded small group class discussion.**

ELECTRONIC CONSENT

By electronically signing below, you are consenting for your child to participate in an online audio-recorded small group class discussion, as outlined above.

Parent/Guardian Signature

No Signature Given

Contact Information

If you have any questions or concerns about this study, please contact the researcher(s) Lisa Armstrong or her supervisor Dr. Jane Springett.

The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. If you have questions about your rights or how research should be conducted, you can call (780) 492-2615. This office is independent of the researchers.

APPENDIX E: Participant Assent for Online Discussions

VERBAL ASSENT FOR CHILDREN – Online Discussions

Study Title: Student Perceptions of the Social-Emotional Wellbeing and Mental Health Impacts of Practicing HeartMath: A Photovoice Informed Case Study.

Research Investigator:
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Edmonton, Alberta, T6G 1C9
(780) 492-0289
Jane.Springett@ualberta.ca

Students that receive electronic parental consent to participant in the online discussions regarding their photographs and journal entries will be invited by the teachers to participate through their school email accounts. Students may decline that email invitation. If they choose to log on to an online discussion, at the beginning Ms. Lisa Armstrong will explain that these discussions will be audio recorded to be able to type out what all was said after and will keep the recordings and typed out conversations confidential and anonymous. Mrs. Armstrong will then verbally ask the participating students if they would like to participate in the rest of the discussion. She will use the script below:

"You do not have to join this part of the study. It is up to you. You can say okay now and change your mind later. All you have to do is tell us you want to stop. No one will be mad at you if you don't want to be in the online discussion or if you join the discussion and change your mind later and stop."

Audio-recordings of the students that provide verbal assent will be kept on confidential record.

APPENDIX F: Photo-Release Consent Form

Consent to Photograph

Photo Release Authorization

I, the undersigned, give permission to the University of Alberta and/or parties designated by the University of Alberta, including the student taking my photograph, to photograph me. I understand that this photograph(s) will be used in support of Lisa Armstrong's Master of Science thesis research project and possibly for display in a public art gallery that will be held at Don Campbell Elementary School in May 2020.

I understand and agree that I will not receive any payment for my time or expenses or any royalty for the publication of the photograph(s) and I hereby release the University of Alberta and/or any parties designated by the University of Alberta from any such claims.

I have read this form and understand this consent and release, and that all questions to do with this consent have been answered.

Signature of Subject	Signature of Witness (student taking photography)
Print Name	Print Name
Date	Date

Photograph ID Number: _____

If you have any questions, please contact the researcher Lisa Armstrong at lisa.armstrong@ualberta.ca.

The plan for this research study has been reviewed by a Research Ethics Board at the University of Alberta. If you have questions about your rights or how research should be conducted, you can call (780) 492-2615 and reference this study's Ethics ID number (PRO0006663). This office is independent of the researcher.

APPENDIX G: Blank Photo Journal Example

Week 1

Name: [*Identification number*]
Photo 1
Question 1 What do you see in your photo? or What is happening in your photo?
Answer 1
Question 2 Why did you take a photo of this?
Answer 2
Question 3 (Answer either question 3 or 4, not both) What does this photo say about what practicing HeartMath is like for you?
Answer 3
Question 4 What does this photo say about changes you notice in you or in others from practising heart math?
Answer 4

APPENDIX H: Online Discussion Group Script Guide

Online Discussion Script Guide

Introduction

[Remind students to have their journals open on another tab]

[Make sure recording on Google Meet and Phone]

Hi everyone, thank you so much for logging on today, I am so excited to see you!

Your parents said it was okay for you to take part in this Google Meet to chat with me. We are going to chat about your HeartMath practice and the photos you took and journals wrote back in school, so I can learn more about what your HeartMath practice was like for you and understand better what your photos and journals meant to you.

This Google Meet will be recorded and then I will type out what everyone says and use the text to find themes in what everyone says. Only me and the people on the research team will ever hear or see the words typed out, no one else. And I won't write down who says what, so no one except Mr. Christensen and I will know who said what. So it's all private and nameless.

Verbal Assent

But you get to decide if you want to be part of this Google Meet. It is up to you. You can say yes you want to take part now, and change your mind later in the chat if you want. All you have to do is tell us you want to stop. No one will be mad at you if you don't want to be in the Google Meet or if change your mind later and stop.

If you do want to be part of this Google Meet, raise your hand and say yes now.

- Okay, think back to when school was still in. Do you remember practicing HeartMath and taking pictures? I'm here to learn more about your pictures and what you wrote in your journals, and what you remember practicing HeartMath in school was really like for you
- I have a couple questions, but this is just a chance to talk to me and each other for the next 30 minutes or so
- There are no right or wrong answers. You can say anything you want here. You are the expert in how you think and feel about HeartMath. This is your chance to tell us adults what practicing HeartMath was really like for you.
- And we want you to talk to each other too. If a classmate says something that reminds you of something, or you want to add to what they said, please do.

Guiding Questions:

For pictures:

- Tell us about your photo?
- What is happening in your photo? (or What do you see here?)
- Why did you take a photo of this?
- How does this relate to HeartMath?
- What does this photo say about what practicing HeartMath is like for you?
- Did you see any changes in you from practicing HeartMath?

- Did you see any changes in your classmates from practicing HeartMath?

- Rather do HeartMath by yourself or with friends? Why?
- Do you think this picture fits under one of themes? Which one? (themes are typed in chat box for reference)
    - How would you describe what calm [happy, whatever theme] feels like for you? How would you tell a student in grade 2 what being calm is?
        - What is it about practicing HeartMath that helps you feel calm?

About any current HeartMath practicing:

- Have you thought about HeartMath since school has closed?
- Have you practiced HeartMath since school has closed?
    - Why have you kept practicing/ Why are you practicing HeartMath at home?
    - What's it been like practicing since school has been closed / at home / during this time?
        - When?
        - Where?
        - How often?
        - Does your family practice with you?
        - What do you notice about yourself after you practice HeartMath at home? What about your family?
- If you haven't been practicing, how come you haven't?
    - What do you think would help you want to or be able to practice at home?

Choose your top three themes that describe what you think of when you think of HeartMath, or what practicing HeartMath is like for you:

- Calm
- Friends
- Heart
- Reminder of HeartMath / Reminder to practice
- HeartMath Bear
- Breathing
- Focus / concentrate
- Increasing these emotions (fun, happy, love, care, smiling, relaxing)
- Reducing these emotions (frustrated, mad, worry, stressed, sad)
- Pets / Animals (remind me of HeartMath)
- Drawing / art / music / reading / sports / hobbies (choose which ones remind you of HeartMath)
- Outside (reminds me of HeartMath)

APPENDIX I: Confidentiality Agreement for Research Assistant

CONFIDENTIALITY AGREEMENT

Study Title: Student Perceptions of the Social-Emotional Wellbeing and Mental Health Impacts of Practicing HeartMath: A Photovoice Informed Case Study.

I, _____, the _____ (specific job description, e.g., Research Assistant, community partner).

I Agree to:

- ❑ keep all the research information shared with me confidential by not discussing or sharing the research information in any form or format (e.g., photographs, journal entries, study ID numbers) with anyone other than the Researcher(s).
- ❑ keep all research information in any form or format (e.g., photographs, journal entries, study ID numbers) secure while it is in my possession.
- ❑ return all research information in any form or format (e.g., photographs, journal entries, study ID numbers) to the Researcher(s) when I have completed the research tasks.
- ❑ after consulting with the Researcher(s), erase or destroy all research information in any form or format regarding this research project that is not returnable to the Researcher(s) (e.g., information stored on computer hard drive).
- ❑ Provide a recent (past 3 months) Criminal Record Check.
- ❑ Complete the Tri-Council Policy Statement (TCPS2) certification (if have not already done so).
- ❑ Inform the Principal Investigator (Lisa Armstrong), the Principal Investigator's Supervisor (Dr. Jane Springett), teachers (Krista McLean or Colin Christensen), and/or Community Liaison Worker (Brooklyn Moe) of any challenges, concerns, or difficulties faced with which further assistance or support is needed.

_____	_____	_____
(Print Name)	(Signature)	(Date)

Researcher

(Print Name)	(Signature)	(Date)

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board (REB1) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

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