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Health Promotion Through Physical Activity in the Classroom: Exploring Teachers' Perceptions

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Health Promotion Through Physical Activity in the Classroom: Exploring Teachers' Perceptions

by

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Abstract

Children are becoming increasingly sedentary, contributing to increased childhood obesity and negative health outcomes. Schools are ideal environments to target increasing physical activity (PA), because it is important for students' developing brains and improving their learning. Some teachers routinely incorporate PA into their classrooms, despite challenges meeting curriculum requirements. Using constructivist grounded theory methodology, I interviewed seven teachers to understand their perceptions of the factors and processes instigating and sustaining their use of classroom PA.

Teachers used PA because their students demonstrated enhanced focus in classroom activities following PA. Four factors influenced teachers to prioritize PA: 1) culture of movement, 2) comfort with activity, 3) personal responsibility for student learning, and 4) teaching philosophy. These teachers approached PA as an integral and positive influence on their students' learning. School nurses can facilitate the knowledge translation of peer experiences, empowering other teachers to adopt similar strategies.

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Dedication

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Abbreviation	Definition
AHKC	Active Healthy Kids Canada
BDNF	Brain Derived Neurotrophic Factor
CBE	Calgary Board of Education
CSEP	Canadian Society for Exercise Physiology
EF	Executive Functioning
GEAR	Getting Energized and Recharged
HPEC	Health and Physical Education Council of the Alberta Teachers' Association
PA	Physical Activity
PAAC	Physical Activity Across the Curriculum
WHO	World Health Organization

Epigraph

"The real reason we feel so good when we get our blood pumping is that it makes the brain function at its best, and in my view, this benefit of physical activity is far more important—and fascinating—than what it does for the body. Building muscles and conditioning the heart and lungs are essentially side effects. I often tell my patients that the point of exercise is to build and condition the brain.

"In today's technology-driven, plasma-screened-in world, it's easy to forget that we are born movers…[but] we've engineered movement right out of our lives… The relationship between food, physical activity, and learning is hardwired into the brain's circuitry. But we no longer hunt and gather, and that's a problem. The sedentary character of modern life is a disruption of our nature, and it poses one of the biggest threats to our continued survival… What's more disturbing, and what virtually no one recognizes, is that inactivity is killing our brains too… To keep our brains at peak performance, our bodies need to work hard… physical activity is crucial to the way we think and feel…" (Ratey, 2008, p. 3-4)

Chapter One: Introduction

Physical activity is a foundational component of maintaining health and wellbeing across the lifespan (World Health Organization (WHO), 2014; WHO, 2015). There is a growing trend towards increasingly sedentary lifestyles and of particular concern is the impact on children (ParticipACTION, 2015). Khan and Hillman (2014) stated that physical activity (PA) is an important element in the developing brains of school children. Therefore, it was prudent that in 2005, Alberta Education (2008) mandated a policy stipulating the daily provision of PA for every student attending grades 1-9. Providing opportunities for PA does not have to occur only in the traditional setting of physical education classes in a gymnasium, it can also occur in the classroom—during, or as a transition between courses. Children purposely moving their bodies could occur *throughout* every school day.

I have been involved as a nurse working with schools in two ways. First, as a Public Health Nurse, or *school nurse*, I was employed through Alberta Health Services with a role of immunizations and health promotion (Alberta Health Services, 2015). Secondly, as a University of Calgary Nursing Instructor, I facilitated groups of nursing students partnering with schools and developing joint health initiatives. In my experience, teachers and administrators are concerned about the inactivity of their students and seek strategies for promoting PA. However, there are barriers to providing PA. Many people assume that students receive adequate opportunities for PA during physical education classes and recesses, but students can choose non-active options at recess, and physical education is often not provided daily (Maeda & Murata, 2004).

I have become a proponent of PA for school aged children after a number of personal events led to some important realizations. First, as an extremely shy child, I gained confidence

through participating in sports. Second, I used running to manage stress. Third, after suffering a concussion and post-concussive symptoms from a cycling accident, I scoured the research for information on brain plasticity, and found that PA and learning "work in complementary ways: the first to make new stem cells, the second to prolong their survival" (Doidge, 2007, p. 253). Fourth, I am a parent with a daughter who has participated in both active and inactive classrooms. My daughter remarked to me while transitioning from a grade five teacher who had incorporated PA throughout the school day, to a new grade six class, "Mom, I just can't sit and sit and sit…I need to move! I'm falling asleep!" At the same time, I was embarking on my Masters of Nursing. I had been studying the academic benefits following sessions of PA, and as a qualitative research course requirement, I interviewed two teachers who regularly implemented PA in their classrooms. Through an associated literature review, I found that students engaging in PA sessions showed improved academic test results (Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Hill et al., 2010; Hill, Williams, Aucott, Thomson, & Mon-Williams, 2011; Kibbe et al., 2011; Maeda & Randall, 2003; & Reed et al., 2010), increased attention levels, memory, (Ratey, 2008), and on task behaviors (Bartholemew & Jowers, 2011; Kibbe et al., 2011; Mahar et al., 2006). Hence, teachers who routinely incorporate PA into their school day may view PA as an important contributor to their students' ability to learn.

Increasing students' PA opportunities during each school day is an upstream approach to reducing inactivity, and may have important implications for student learning. Public Health Nurses are in the position to advocate for the school age population and must be knowledgeable about evidence based practice and the perceptions of the teachers. Due to my experience as a school nurse and as an advocate of PA for the school age population, I believe I have a unique understanding of teachers' perspectives and can appreciate many of the barriers to children

receiving PA. Promoting the classroom as an environment conducive for students to receive PA opportunities during the school day, while at the same time increasing their academic performance is an opportunity worth exploring.

Background to the Problem of Childhood Physical Inactivity

The WHO (2010) identified physical inactivity as the "fourth leading risk factor for global mortality" (p. 7). Active Healthy Kids Canada (AHKC) (2014) provided leadership in the form of coordinated research and action on the inactivity of children and youth, and published the annual Report Card on Physical Activity for Children and Youth for a decade. According to the new ParticipACTION report card (2015) using data from the Canadian Health Measures Survey (2012-2013), only 14% of Canadian children aged 5-11 years meet the daily PA recommendations. The Canadian Society for Exercise Physiology (CSEP) (2012) recommended that every child aged 5-11 years should receive 60 minutes a day of moderate to vigorous intensity PA. Moderate intensity PA increases heart and respiratory rates, and is estimated by the individual as a 5-6 on an intensity scale of 10 (CSEP, 2012). Vigorous intensity PA further increases heart and respiratory rates, with individuals estimating their intensity levels at 7-8 (CSEP, 2012). CESP (2012) also recommended minimizing children's sedentary time by limiting their "recreational screen time" (p. 6) (television, computer, video gaming) to two hours and promoting movement during prolonged periods of sitting.

Roberts, Shields, de Groh, Aziz, and Gilbert (2012) stated that there is a 33% incidence of overweight and obese 5-17 year olds based on the anthropometric measurements of 2,123 participants, as documented in the Canadian Health Measures Survey (2009-2011) (Statistics Canada, 2013). Shields (2006) noted that the percentage of overweight and obese children has more than doubled when compared to the 15% incidence in 1978 from self-reported results in the

Canadian Health Survey (1978) (Statistics Canada, 1978). Reinforcing the growing concern is Singh, Mulder, and Twisks' (2008) systematic review of the literature, including 25 studies documenting that overweight or obese adolescents are at increased risk of remaining overweight or obese as adults. Health concerns for overweight adults include heart disease (Zalesin, Franklin, Miller, & Petersen, 2008), cancer (Danaei et al., 2005), stroke, and type 2 diabetes (Smith, 2007).

Reilly et al. (2003) performed a systematic review of the literature from 1997-2001 to determine if there were health consequences of childhood obesity. Based on nine studies, five critically appraised as high quality studies (defined as including "level 1 evidence, systematic reviews, meta-analyses, and randomized controlled trials") (p. 748), Reilly et al. concluded that "obese children *are* more likely to experience psychological or psychiatric problems" (p. 749), particularly low self-esteem and behavioral issues. From 34 studies largely rated as high quality, consistent associations were documented between obesity and high blood pressure, five high quality studies documented associations between pediatric obesity and asthma (Reilly et al., 2003), and five high quality studies demonstrated a "twofold risk for developing type 1 diabetes" (Reilly et al., 2003, p. 750). It has been estimated that the direct cost of obesity from all ages of Canadians to the healthcare system is $1.6 billion annually, and $2.7 billion indirectly (Health and Physical Education Council of the Alberta Teachers' Association (HPEC), 2009). Hence, increasing the PA levels of children has the potential to affect their health long term and decrease a subsequent financial impact upon the health care system.

Why Target Schools?

PA should be promoted within schools because of its impact on students' developing brains for "improved learning and mental performance" (Cotman & Berchtold, 2002, p. 295).

Sibley and Etnier (2003) found a significantly positive relationship (effect size 0.32) between PA and cognition in children in their meta-analysis of the literature using 44 studies. They noted that the strongest relationship between PA and cognition was for children aged 4-13 years (Sibley & Etnier, 2003). They offered the possible explanation that "young children learn best when they are moving" (Sibley & Etnier, 2003, p. 252). Hillman, Erickson, and Kramer (2008) postulated that the findings of Sibley and Etnier (2003) "suggest that although PA might be beneficial at all stages of life, early intervention might be important for the improvement and/or maintenance of cognitive health and function throughout the adult lifespan" (Hillman et al., 2008, p. 59). Schools could provide students with PA to positively affect their early academic achievements, which may help affect their cognitive abilities in later adult life.

The Institute of Medicine (2013) assessed the literature on PA, physical education, and fitness and recommended that 60 minutes of moderate to vigorous activity is critical for students' "cognitive development and academic success" (p. 1). Khan and Hillman (2014) stated that children's brains are still developing during their school years, and as such, every effort should be made to enrich their environment, especially through the use of PA and aerobic fitness. Best (2010) analyzed 11 experimental studies testing the relationship between executive functioning and chronic and acute exercise programs. He defined executive functioning as the "[higher order] cognitive processes necessary for goal-directed cognition and behavior, which develop across childhood and adolescence" (Best, 2010, p. 331). Best concluded that the studies suggest that both acute and chronic aerobic exercise may facilitate children's executive functioning, however, "chronic participation in aerobic exercise may induce more enduring improvements to EF [executive functioning]" (p. 338). He also noted that exercise has a stronger effect on executive functioning when the activity requires complex motor skills, or is cognitively engaging

such as when playing games (Best, 2010). Best hypothesized that the difference in effect may be related to engaging more pathways when executive functioning is required during exercise. Including PA during the school day may provide another means of building and strengthening important pathways in the brain.

Ferris, Williams, and Shen (2007) advocated for prescribing PA for maintaining and improving brain function. Based on a small sample (n=15) they found significantly elevated brain derived neurotrophic factor (BDNF) levels in adult participants following exercise, and improved cognitive functioning scores on color and word tests (Ferris et al., 2007). BDNF is a protein that promotes the survival of neurons (Binder & Scharfman, 2004; Hillman et al., 2008), and is essential for synaptic plasticity (Binder & Scharfman, 2004; Vaynman, Ying, & Gomez-Pinilla, 2004) and learning and memory (Vaynman et al., 2004). Ratey (2008) explained the function of BDNF using an analogy of providing fertilizer to plants; BDNF causes the brain's circuits to grow larger and stronger, improving their functioning and mimicking the effects as when learning occurs. Vaynman et al. (2004) studied the enhanced cognitive functioning of exercising animals, and investigated the causal link between exercise-induced cognitive improvement and BDNF action, to examine if there were combined actions that impact the effect. They found that in (n=28) adult male rats, the "exercise-induced enhancement in learning and memory" was prevented if they inhibited the release of BDNF during exercise (Vaynman et al., 2004).

Hillman et al. (2008) stated, "there is converging evidence at the molecular, cellular, behavioral and systems levels that PA participation is beneficial to cognition" (p. 58). In addition to increases in BDNF, PA optimizes learning conditions within the brain by affecting the regulating neurotransmitters: serotonin, norepinephrine, and dopamine (Ratey, 2008).

Medications treating attention deficit hyperactivity disorder, depression, and anxiety target the same neurotransmitters (Ratey, 2008). PA may produce changes at all levels of the brain that prove beneficial for students' learning at school, a factor that should be prominent in policy planning.

In 2005, Alberta Education implemented a policy mandating 30 minutes of daily PA for students in grades 1-9 (Alberta Education, 2008). The policy is supported by the Comprehensive School Health framework, "an internationally recognized approach," (Pan-Canadian Joint Consortium for School Health, n.d., p. 1), whereby health and education work together to achieve healthy students who have an improved ability to learn (HPEC, 2009). The model is based on a whole-school approach, with actions directed towards four distinct yet inter-related components: social and physical environment, teaching and learning, healthy school policy, and partnerships and services (Pan-Canadian Joint Consortium for School Health, n.d.). Each of the four components can be related to PA integrated in the school day as a health and learning resource.

The first component is social and physical environment, which includes positive relationships among school staff and students, and the amenities within the environment such as the gymnasium and school grounds (Pan-Canadian Joint Consortium for School Health, n.d.). The second component, teaching and learning, refers to the curriculum providing students' with age appropriate knowledge and skills (Pan-Canadian Joint Consortium for School Health, n.d.). Third, healthy school policy promotes healthy practices to shape student and school wellbeing (Pan-Canadian Joint Consortium for School Health, n.d.). The fourth component, partnerships and services, is the promotion of the school, families, and community services working together to promote health and wellbeing within the community (Pan-Canadian Joint Consortium for

School Health, n.d.). The daily PA policy relates to all four of the Comprehensive School Health components. Public Health Nurses should work with teachers, families, and students to increase awareness and support for the policy in promoting the health and active living of the community.

In a 2007 email survey of 1,025 participants (60% teachers and 40% principals), 58% reported that the daily PA policy was being met through daily physical education classes (Alberta Education, 2008). The results are promising, however to be true to the Comprehensive School Health approach that health and learning are not separate (HPEC, 2009), PA should be considered throughout the day, and not only in terms of physical education. If PA is provided separately from physical education, students would benefit during the day even when the gymnasium is unavailable, a noted barrier to daily PA provision (Alberta Education, 2008).

Schools provide environments for children to be educated, and as such, every effort should be made to optimize their ability to learn. Hence, PA should be integrated with student learning because of its benefits to the brain. Aerobic exercise has been shown to increase executive functioning (Best, 2010), and increase BDNF (Ferris et al., 2007) improving learning and memory (Vaynman et al., 2004). Including PA throughout the day is congruent with the Comprehensive School Health framework, whereby health is incorporated into "all aspects of school and learning" (Pan-Canadian Joint Consortium for School Health, n.d., p. 1).

Expanding the Reach of Physical Activity Beyond Physical Education.

The World Health Organization (2015b) defined PA as "any bodily movement requiring energy expenditure." (Health topics section, para. 1). Some teachers have found it useful to incorporate movement beyond the confines of the gymnasium (M. Deen, personal communication, September 16, 2013). There are significant challenges to providing daily PA when physical education is the exclusive method of students receiving PA. Physical education is

a curricular course provided to every elementary aged student, founded upon developing knowledge, attitudes, and skills necessary for a physically active lifestyle (Alberta Education, 2000). Where difficulty arises, is finding the balance between instructional minutes in physical education and students *standing around* instead of *moving*. Second, the frequency of physical education is variable (Gibson et al., 2008; Maeda & Murata, 2004). There may be options other than the gymnasium for providing students with PA throughout the school day, such as within the classroom.

Targeting Teachers for Classroom Physical Activity.

Teachers could be targeted as important providers of PA for their students. Webster (2011) argued that *elementary* classroom teachers are "ideally positioned to provide additional PA opportunities" (p. 321), because they typically spend more time with their students than junior and senior high teachers. In addition to targeting teachers as the important providers of PA, they are also role models to their students. Donnelly and Lambourne (2011) conducted a study measuring the impact of PA on body mass index (BMI) and academic testing of 77 elementary students over three years. They found that teachers who participated with their students during PA, had students that achieved higher activity levels (Donnelly & Lambourne, 2011). Elementary teachers represent students' best chance at receiving PA opportunities during the school day for improvements in learning, health, and an introduction to lifelong habits of PA incorporated throughout their days. Hence, it makes sense to target teachers for increasing PA opportunities in the classroom.

Education adviser to the Premier of Ontario and to the Minister of Education, Fullan (2007) contended that, "educational change depends on what the teachers do and think, it's as simple and complex as that" (p. 129). Huberty, Dinkel, Coleman, Beighle, and Apenteng (2012)

stated more explicitly, that teachers "impact the success of PA within schools" (p. 968). Hence, to effectively target teachers as important facilitators of PA implementation independent of physical education, it is important to understand the context in which teachers regularly implement PA in their classrooms.

Guskey's (2002) model of the Process of Teacher Change "is predicated on the idea that change is primarily an experientially based learning process for teachers" (p. 384). Consequently, changes in attitudes and beliefs come only *after* teachers experience improvements in their students' learning (Guskey, 2002). Guskey's model provides support for the proposed study of exploring the perceptions of teachers who have successfully adopted PA practices within their classrooms. Understanding teachers' attitudes and beliefs is an important step towards developing effective strategies to encourage other teachers to adopt and sustain similar practices.

Purpose of the Study

Given the trend in the last decade demonstrating that Canadian children are not receiving the recommended daily amounts of PA (ParticipACTION, 2015), schools may provide an opportunity to promote the health of students and the communities where they reside (Whitehead, 2006). Schools can offer environments where PA increases students' academic learning behaviors, countering the barrier of using teaching time (Trudeau & Shephard, 2008). Some teachers have adopted and sustained their use of classroom PA, while others hesitate to do so if they perceive that time is taken away from core curriculum (Maeda & Murata, 2004). In Alberta, 30 minutes of daily PA is the policy for all students attending grades 1-9 (Alberta Education, 2008). Hence, all teachers can benefit from learning about the research highlighting the experiences and strategies of their peers.

The purpose of this study is to explore teachers' perceptions of their experiences using PA in their classrooms. I have chosen a strength-based research approach to guide this study for two main reasons. First, barriers to teachers using PA are documented such as: loss of teaching time (Dwyer et al., 2003; Maeda & Murata, 2004), perceived increase in classroom disturbances following PA (Gibson et al., 2008), and lack of availability of the gymnasium (Alberta Education, 2008; Dwyer et al., 2003). Second, Guskey's (2002) model of the Process of Teacher Change explained that a change in attitude occurs only after experiences of success. Hence, I explored teachers' experiences of success by interviewing teachers who had sustained their use of classroom PA.

Concluding Remarks

The Ottawa Charter for Health Promotion stipulated that "health promotion is the process of enabling people to increase control over, and to improve their health…[and] health is…a resource for everyday life" (WHO, 1986, p. 2). Public Health Nurses are in direct contact with members of schools and communities, and have the capacity to affect the school age population. Children spend six hours of their day in the school environment, and up to two hours commuting to and from schools, therefore nurses can work with school staff under the Comprehensive School Health framework to integrate opportunities for PA during the school day. Authors have documented academic benefits from students engaging in PA (Bartholemew & Jowers, 2011; Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Hill et al., 2010; Hill et al., 2011; Kibbe et al., 2011; Mahar et al., 2006; Maeda & Randall, 2003; & Reed et al., 2010. Teachers can benefit from research highlighting their peers' experiences instigating PA on their own accord and the reasons why they sustained their practice.

Overview

In this chapter, I provided an overview of this study, detailing the prevalence of physical inactivity amongst Canadian school aged children, background to the problem, the relevance of the school environment, the role of the Public Health Nurse, and the purpose of this study. In chapter two, I provide a description of the literature review, in the context of a grounded theory study. In chapter three I describe the ethical considerations, method, and storage of data for this study. In chapter four I present the theoretical model that emerged during this study, *Teachers Prioritizing Physical Activity*, and I explain the findings of the study. In chapter five, I discuss the findings in relation to the extant literature, examine the strengths, weaknesses, limitations, and recommendations for future research, and suggest implications for both teachers and nurses.

Chapter Two: Literature Review

I will begin by situating the literature review in the context of grounded theory. Glaser and Strauss (1967) stated that in classic grounded theory the literature review should be delayed until after the data analysis, so that researchers were not imposing ideas upon their work. Conversely, Charmaz (2014) recognized that most often, researchers have a familiarity in the desired area of study, and that most institutions require literature reviews prior to granting approval to research proposals. Thornberg (2012) argued that an informed researcher should not be considered problematic. Instead, Thornberg asserted that the researcher must take a critical stance, and understand "that data always are social constructions and not exact pictures of the reality" (p. 249). In aligning with the constructivist grounded theory approach to this study, I engaged in a literature review prior to embarking upon my study, and present a critical analysis of the literature.

Differentiation of terminology

The following terms were used in this literature search: perception and PA. Perception is defined as an intuitive process, using the senses to recognize, understand, and appreciate (Pickett, 2005). Physical activity is defined as any bodily movement requiring energy expenditure (WHO, 2014). In schools, PA commonly occurs in physical education, a required and graded course (Alberta Education, 2000) most often occurring in a gymnasium, and sometimes taught by a specialist. However the focus of this review is to determine the literature on teachers' perceptions of using PA in their classroom, distinct from physical education. Teachers may hold different attitudes towards PA when placed in a context such as the classroom, which is separate from physical education. Therefore, this study will focus on PA that occurs exclusive of physical education.

Search strategy

Review of the literature consisted of searches from five online databases: CINAHL PLUS, MEDLINE, PubMed, PsycINFO, and ERIC. The following search terms were used: ("physical activity" OR "exercise" OR "daily physical activity"), AND ("academic achievement" OR "academic performance" OR "cognitive function" OR cognition OR "cognitive abilities", OR "student learning" OR "student learning behaviors"), AND (teachers OR "teacher perceptions" OR "teacher beliefs" OR "teacher attitudes" OR "teacher advocacy" OR "faculty beliefs").

Searches were limited to the years 2002-2015 and only English language papers with full texts available were reviewed. Inclusion criteria included peer reviewed publications, study populations of grades 1-6 students and teachers, PA as the specified intervention, and the use of a PA measurement outcome such as number of steps taken or time engaged in PA. Exclusion criteria included a focus on minority groups, chronic illnesses, special needs, learning disabilities, or interventions pertaining to physical education classes or teachers, recesses, fitness levels, or any combined PA intervention such as nutrition, strength, or flexibility.

Study retrieval

My initial search did not identify any studies specifically targeting teachers' perceptions of using PA in their classrooms. I expanded the search to include the current intervention studies performed within classrooms that demonstrated positive relationships between PA and academic achievement, or student learning behaviors. This search yielded 948 citations. I scanned the titles and abstracts of each citation for relevancy to the research topic—grades 1-6 teachers using PA in their classrooms. There were 12 articles that met the inclusion and exclusion criteria of this review. However, due to similarities in intent to my study, I chose to include three

qualitative studies previously excluded due to the specified criteria. One study included preschool to grade two teachers (Maeda & Murata, 2004), and two studies were conducted solely on a minority group and included teachers of grades 1-12 (Cothran, Hodges Kulinna, & Garn, 2010), and kindergarten to grades 12 teachers (McMullen, Kulinna, & Cothran, 2014). There were 15 articles included in this review, of which five were specific in their content on teachers' experiences using PA in their classrooms.

Study characteristics

Among the 15 articles included in this study, five were chosen for their content on teachers' experiences using PA in their classrooms. These articles were: descriptive qualitative (Maeda & Murata, 2004), qualitative (Cothran et al., 2010; Gately, Curtis & Hardaker, 2013; McMullen et al., 2014), and mixed methods (Gibson et al., 2008). One article was a systematic review of the literature on PA and student school performance (Singh, Uijtdewilligen, Twisk, van Mechelen, & Chinapaw, 2012). Nine intervention studies were included for their content on PA used in the classroom with an academic testing measurement as an outcome (Ahamed et al., 2007; Bartholemew & Jowers, 2011; Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Hill et al., 2010; Hill et al., 2011; Kibbe et al., 2011; Mahar et al., 2006; Reed et al., 2010). The articles were published between 2004-2014. Eleven of the studies were conducted in the United States (Bartholemew & Jowers, 2011; Cothran et al., 2010; Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Gately, et al., 2013; Gibson et al., 2008; Kibbe et al., 2011; Maeda & Murata, 2004; Mahar et al., 2006; McMullen et al., 2014; & Reed et al., 2010). One study was conducted in Canada (Ahamed et al., 2007), and two studies were in Scotland (Hill et al., 2010; Hill et al., 2011). Singh et al. (2012) review of the literature included studies from the United States, Canada, and South Africa (see Appendix A-D for summaries of all articles).

Teachers' Perceptions

Five articles were chosen for their content on teachers' perceptions of using PA in their classrooms (see Appendix A for Teachers' Perceptions), and one article (Kibbe et al., 2011) will also be discussed in this section as well as the intervention section due to the inclusion of one relevant teacher comment. Cothran et al. (2010) conducted a study on 23 grades 1-12 teachers from 10 Native American Southwestern United States schools. Data collection occurred through two teacher interviews, and reflective journaling from both the teachers and a mentor teacher. I viewed the qualitative research design as a strength of this study, because it was a similar approach to my proposed study. Cothran et al.'s use of two interviews for every teacher was also a strength, because it capitalized on gaining teachers' perceptions at two different times, which may have provided richer data. There were three weaknesses in the Cothran et al. study. First, teachers from all grades were included. Teachers from grades 7-12 spent less time with their students than their counterparts, therefore it was difficult to align their comments. Second, the schools had small populations of 14-107, which may decrease the relevance to other settings. Third, the use of structured interview questions and providing teachers a choice of answers did not capitalize on the full extent of teachers' own responses.

Highlights of the interviews were twofold. First, teachers were personally motivated to participate in the study due to their desire to meet the needs of the whole student (Cothran et al., 2010). Second, "although all teachers reported a general awareness of the need for alert, engaged learners, none were able to clearly describe direct links between experiential learning or academic integration and academic success" (Cothran et al., 2010, p. 1387). However, teachers did speak about PA in the class favourably with the following quotes: "I… find better results with my kids if I keep them more active…and [they are then] a little more likely to learn"

(Cothran et al., 2010, p. 1385); PA is fun and engaging, and is "a way to get students excited about school" (p. 1384); when students arrive at school tired, "they're groggy…and they're sitting there like this…[makes a face] and I'll say alright we're going to go out and run, and then I can take them out and run, come back, and then they can focus" (p. 1385). Most of the teachers felt the PA helped "student engagement and readiness to learn" (Cothran et al., 2010, p. 1384). The authors of the study concluded that there were two possible generalizations: 1) that for these teachers, engaging in the study was based on caring for their students' individual lives and wellness needs, and 2) the teachers themselves had an interest in wellness, and there was an overlap between the teachers' beliefs and the goals of the study (Cothran et al., 2010).

McMullen et al. (2014) presented a study that was part of a larger investigation similar to Cothran et al.'s (2010)—to explore teachers' perceptions of integrating a PA intervention into curriculum. McMullen et al. also focused on an Indigenous school district in the Southwestern United States and interviewed grades K-12 teachers using semi-structured interviews, 1-2 times between November and April of the school year. Only three schools were included in this study compared to ten schools in Cothran et al. However, it appeared that in Cothran et al., a PA program was implemented within the whole school, whereas in the study by McMullen et al., only some of the teachers in the three schools volunteered to participate.

McMullen et al. (2014) identified three key features of teachers' perceptions of the PA program: 1) despite volunteering for the study, teachers were apprehensive to use PA believing it a threat to their classroom control, 2) they preferred the PA session if it had clear links to academic content, and 3) PA sessions should be easy to implement and fun for their students. A unique finding of the study was that some teachers found success by using PA as a reward (McMullen et al., 2014). A strength of the study was the provision of a table to indicate the

pseudonym and grade level of each of the teachers, making it easier to relate to the relevant quotation and understand the context of the grades 1-6 teachers (McMullen et al., 2014), of whom I was most interested. McMullen et al. concluded that teachers view academic content as their priority, hence PA that links to curriculum may be the most successful strategy to obtaining teacher buy-in.

Gately, Curtis, and Hardaker (2013) also used a qualitative approach and interviewed teachers with the aim of gaining their viewpoints on implementing the TAKE 10! program, an intervention integrating 10 minutes of PA linked to curriculum. The study occurred in the Yorkshire region of the United Kingdom, and was comprised of eight grades 3-6 teachers from two schools (Gately et al., 2013). Semi-structured interviews occurred three times over one year (Gately et al., 2013). Gately et al. identified two themes: barriers and benefits of implementing TAKE 10! Curriculum constraints and lack of time was a barrier to implementing a PA program, common to all three studies (Cothran et al., 2010; Gately et al., 2013; McMullen et al., 2014). Gately et al. found that enjoyment was a noted benefit of PA implementation, as noted by McMullen et al. (2014). In addition, teachers also noted that the PA positively affected student engagement and focus (Cothran et al., 2010; Gately et al., 2013). A limitation of this study was the short interview length of 10-15 minutes (Gately et al., 2013); teachers may have imparted other revelations during the interview that could have enhanced the study results if more time was allowed.

Gibson et al. (2008) conducted a study in the Midwestern United States on the first year process evaluation results of increasing PA Across the Curriculum (PAAC), with the results demonstrating a decrease in the BMI of students in grades 2-5. A cluster-randomized controlled study was used with 4,905 students in 24 schools, 14 intervention and 10 control groups (Gibson

et al., 2008). The study incorporated a mixed methods approach, sending out online questionnaires to the principals, teachers, and using qualitative focus groups to engage teachers in discussions about their perceptions using PAAC (Gibson et al., 2008). There were 79 teachers out of 135 who participated in focus group discussions, consisting of approximately 13 teachers in each group (Gibson et al., 2008).

The results of the focus group discussions on teachers' perceptions of PAAC were noted as favorable towards PA, a similar finding to the study by Cothran et al. (2010). Some teachers had worried that the PA would cause students to become "wild and out of control" (Gibson et al., 2008, p. 5), a similar belief in teachers noted by McMullen et al. (2014). However the opposite was found to be true, PA "helped with behavior management, stopped the fidgeting, and made the students more alert and focused" (Gibson et al., 2008, p. 5). Teachers indicated, "active lessons encouraged them [the students] to be more creative, and helped students learn concepts better and improved their memorization skills" (Gibson et al., 2008, p.5). One teacher commented, "[The PA] really helped my students remember things, especially spelling" (Gibson et al., 2008, p. 5). A weakness of the study was the limited reporting of the qualitative findings from the teacher focus groups. The reader was unable to ascertain if all the teachers were in agreement with the highlighted comments.

Maeda and Murata (2004) presented a descriptive article documenting their attempt at augmenting PA within schools. To increase the frequency of PA within classrooms not only in the gymnasium, they implemented the program, Getting Energized and Recharged (GEAR) requiring teachers to implement five minutes or more of PA a week (Maeda & Murata, 2004). There were 24 preschool to grades two teachers from three schools that participated in the study (Maeda & Murata, 2004). From these 24 teachers, only three teacher comments were referred to

in the article, and only one was relevant to this literature review (Maeda & Murata, 2004). One teacher stated that PA provided between lessons helped the students to refocus (Maeda & Murata, 2004), which was also noted by a teacher in Cothran et al. (2010), and was an identified theme in the focus groups in Gibson et al. (2008). Though the Maeda and Murata (2004) article included preschool and kindergarten teachers, improved focus of students was relevant to include in this review.

The strength of the Cothran et al. (2010), Gately et al. (2013), Gibson et al. (2008) and McMullen et al. (2014) studies were that they specifically targeted teachers and gained their insights into delivering PA integrated with curriculum. The authors of the five articles provided the teachers' context that PA was helpful in the classroom: as an engagement strategy, to wake up students, increase focus (Cothran et al., 2010); to promote student enjoyment and engagement (McMullen et al., 2014); to improve focus, concentration, attention, promote enjoyment and engagement (Gately et al., 2013), to manage fidgeting and promote student focus, increase memory (Gibson et al., 2008); and to help students re-focus (Maeda & Murata, 2004).

Kibbe et al. (2011) provided a review of a ten-year PA integration program—TAKE 10!®. It was the only article out of the nine intervention studies that provided mention of teachers' perceptions (see Appendix C). Kibbe et al. cited the TAKE 10!® study by Lloyd et al. (2005), that "86% of teachers agreed or strongly agreed that the activity breaks helped students refocus during long academic blocks" (p. S46). Gaining student focus following a session of PA was a theme expressed in four of the five previously discussed articles (Cothran et al., 2010; Gately et al., 2013; Gibson et al., 2008; Maeda & Murata, 2004). McMullen et al. (2014) did not name focus as a benefit to implementing classroom PA, which may have resulted because 8 of the 12 teachers interviewed were senior high school teachers, known to spend less time with their

students than elementary teachers and may have had differences in their abilities to provide PA sessions.

All of the articles discussed above had a specific PA program as an intervention. There may be teachers who are not implementing specific programs, and have valuable perceptions about their experiences using their own methods. Teachers who are implementing PA independently of an intervention, represents a unique addition to the existing literature. These teachers may have unique experiences that are important to explore for sustainability of practices.

Intervention studies: Academic testing following physical activity

There were eight intervention studies that documented a positive relationship between classroom PA provided by the teacher, and increased academic achievement or student learning behaviors (Bartholemew & Jowers, 2011; Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Hill et al., 2010; Hill et al., 2011; Kibbe et al., 2011; Mahar et al., 2006; & Reed et al., 2010). One study showed no negative results despite a decrease in teaching time (Ahamed et al., 2007). Of the nine intervention studies, two types of PA interventions were included and were broadly identified as: 1) PA used as a *break* between lessons (Ahamed et al., 2007; Hill et al., 2010; Hill et al., 2011), and 2) PA *integration*, whereby student movement was encouraged *during* teaching (Bartholemew & Jowers, 2011; Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Kibbe et al., 2011; Mahar et al., 2006; & Reed et al., 2010). Both types of interventions demonstrated statistically significant positive relationships with students' academic achievements (see Appendix B for PA Breaks and Appendix C for PA Integration).

The three intervention studies that provided a PA break prior to teaching were compared for similarities. The range in PA duration was 10-15 minutes, the frequency was five days a

week, and the intervention length ranged from two weeks to 16 months (Ahamed et al., 2007; Hill et al., 2010; Hill et al., 2011). The six interventions that integrated PA while teaching the curriculum, ranged in length from 18 days to three years, but the duration and frequency were variable (Bartholemew & Jowers, 2011; Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Kibbe et al., 2011; Mahar et al., 2006; & Reed et al., 2010). Hill et al. (2010; 2011) provided the only two studies that could be directly compared. The intent of Hill et al. (2011) was to test reproducibility of the earlier study (Hill et al., 2010), but using a more socio-economically diverse sample of children. Both studies demonstrated increased academic results on a cognitive test battery (Hill et al., 2010; 2011). Due to variations in all the PA interventions, the wide variability in duration and frequency, it was not possible to identify a trend.

Academic testing and the timing of testing varied among PA intervention studies. The academic testing included: the Canadian Achievement Test (Ahamed et al., 2007), a cognitive test battery (Hill et al., 2010; Hill et al., 2011), time on task (Bartholomew & Jowers, 2011; Mahar et al., 2006), the Wechsler Individual Achievement Test-2nd edition (Donnelly & Lambourne, 2011), reading and mathematics scores (Erwin, Fedewa & Ahn, 2012), the Florida Comprehensive Achievement Test (Kibbe et al., 2011), and non-invasive fluid intelligence testing (Reed et al., 2010). The timing of the academic testing occurred immediately following a session of PA, except for Hill et al. (2010; 2011) whereby PA was provided 30 minutes after lunch, and the testing occurred at the end of the day. Hence, the timing of PA may not be a factor in providing students with academic gains.

The intervention studies provide evidence demonstrating higher academic test scores following PA (Bartholemew & Jowers, 2011; Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Hill et al., 2010; Hill et al., 2011; Kibbe et al., 2011; Mahar et al., 2006; & Reed et

al., 2010). However, there is not an ideal formula for the frequency, duration, time of day, or types of PA that will translate into academic benefits within their classrooms. Hence, it is likely that there are many ways that teachers can implement PA and have positive effects on student learning.

One systematic review was included in this literature review (see Appendix D for Systematic Review). Singh et al. (2012) reviewed 14 longitudinal studies and concluded that PA is positively related to academic achievements (Singh et al., 2012). Only two of the studies reviewed in Singh et al.'s (2012) article were included and discussed in this review, they were Donnelly et al. (2009) and Ahamed et al. (2007). All studies within the review were checked for inclusion but were excluded due to student ages, the self reporting of the PA occurring after school hours by parents or students, the ability to include physical education participation as the PA, or an intervention deemed too prescriptive and using too many pieces of equipment to be implemented by a classroom teacher in a classroom. A weakness of the review was the self-reporting of the PA and academic achievements in the studies. Additionally, the studies were not exclusive to PA occurring within the school day, or before academic testing, providing limited usefulness for the intent of this literature review.

Summary

Of the nine intervention studies that followed PA with academic testing, it was consistently the classroom teacher who provided the PA intervention. However, the teachers' observations and perceptions of the interventions were not captured. Kibbe et al. (2011) included one teacher's anecdotal comment, that following PA her class could refocus. Teachers implementing their own PA interventions may have other relevant perceptions that should be explored and shared with other teachers who have not adopted similar practices. Knowledge

translation is the important steps of moving research into practice. The empirical data is readily accessible demonstrating a positive relationship between PA and academic testing. However, teachers may find the stories of their peers farther reaching, hearing teachers experiencing similar challenges and finding realistic solutions. It is my intent to extend the reach of the studies and explore teachers' perceptions on their use of PA, distinct from an intervention program. Chapter three will explain the research methods used to conduct this study.

Chapter Three: Methods

In this study, I explored the experiences of teachers implementing PA in their classrooms using the constructivist grounded theory method (Charmaz, 2014). Charmaz (2014) explained that grounded theory emphasizes "examining processes, making the study of action central, and creating abstract interpretive understandings of the data" (Charmaz, 2014, p. 16). She described constructivists as assuming that "social reality is multiple, processual, and constructed" (Charmaz, 2014, p. 13). I used interviews to understand the central phenomenon of teachers' experiences using PA within their classrooms, and to explore the context and complexities through which they perceive and base their decisions. Interviewing teachers provided the ability to co-construct interpretations about the experiences they wished to highlight. The qualitative design provided me with an opportunity to clarify answers and progress questions from interview to interview, rather than limiting myself to preset questions in an online survey. The resulting theory is grounded in the data, and represents the co-construction of understanding the multiple factors that assist teachers to instigate and sustain their practices of PA within the classroom.

In this chapter, I will begin by restating the research question. I will then explain how the constructivist methodology is an appropriate fit for this study and how this inquiry has guided the grounded theory methods. I will outline the recruitment of participants, the interview process, data storage, analysis, and memo writing. Finally, I will outline my actions for ensuring data accuracy and the ethical considerations for the participants.

Research Question

The research question guiding this study was, "What are teachers' perceptions of the factors and processes that instigate and sustain their use of classroom PA?"

Research Design

Grounded theory methods provided "systematic, yet flexible guidelines for collecting and analyzing qualitative data to construct theories…grounded in their data" (Charmaz, 2014, p. 1). I chose the constructivist approach to grounded theory for this study, as my intent was to move beyond description and to understand and theorize about the processes and actions behind the phenomenon of teachers instigating and sustaining PA (Charmaz, 2014). Within the constructivist methodology, I could acknowledge my experience in research and in public health nursing (Charmaz, 2014). The approach facilitates the interviewer and the interviewee to enter an exchange and co-construct understanding (Charmaz, 2014). Some teachers noted an increased understanding about their *own* use of PA following the interviews, reflecting that learning can occur during the interviews for both the participant and the researcher (Charmaz, 2014). As the researcher, co-constructing interpretations with the participants provided a theory that was grounded in the data, rather than creating my own interpretations of the exchange.

Research Methods

Data Collection.

Selecting participants. I used theoretical sampling to select participants. Theoretical sampling allows the researcher to choose participants who will illuminate a particular area of relevance (Charmaz, 2014). I chose to interview teachers who were already incorporating PA in their classrooms. I wanted to examine why teachers implemented PA, rather than why they did not. Hence, the inclusion criteria for teachers were established as: 1) teaching grades 1-6 in the Calgary Board of Education (CBE) school system, 2) teachers representing all quadrants in Calgary, and 3) teachers from both the primary division of grades 1-3, and secondary division of grades 4-6. Characteristics that would have excluded a teacher from being interviewed were: a

role in administration, a teacher in a permanent PE position, a substitute teacher, or a teacher's aide.

I determined that approximately 8-12 teachers would be required to reach theoretical saturation, which is described as occurring when no new items are introduced and the theory is well developed (Charmaz, 2014). Baker and Edwards (2012) asked 14 experts the question, "How many qualitative interviews is enough?" with the resounding answer that, *it depends* on the unique aims and components of the research. I decided on a range of study participants to allow for theoretical saturation. I based my decision upon previous experience with a similar research question involving interviewing two teachers, and my commitment to uphold the CBE agreement to complete interviews by May 2015 (CBE, 2013). I also considered the number of teachers using classroom PA who might be available for interview. I interviewed a total of seven teachers when theoretical saturation occurred (further explained in the section on Rigor).

Recruitment strategies. I received approval from the University of Calgary Conjoint Health Research Ethics Board on October 21, 2014, ID REB14-0644. I then applied to the CBE and gained research approval on December 2, 2014. The CBE Systems' Assistant Principal (PK) signed a letter of agreement to assist with accessing participants (see Appendix E). I provided my contact information and an introduction to my research study (see Appendix F) to the Comprehensive School Health Lead (NH), who emailed the information to *Health Champions*— likely candidates for interviews. This yielded only one participant. I attended two CBE in-services on PA, but only met the same eligible candidate. Colleagues aware of my study provided the names and emails of two potential participants. I emailed these teachers my information and they both volunteered to participate. I also emailed principals and teachers,

having obtained their email addresses from their school websites, and recruited the four other participants.

Interview process. My research began in January 2015, and I abided by the CBE (2013) research policy that interviews could not occur during the month of June. To limit participant burden and to provide context to the classroom, I conducted the interviews at the teachers' school site and tried to limit the length to one hour. Time and date were at the teachers' convenience, but I requested after school to avoid disruptions.

I used semi-structured interviews to allow for responsiveness to participants' stories. I chose open-ended questions to establish the topic and allow participants the opportunity to highlight thoughts they believed important (Charmaz, 2014). The interview guide can be found in Appendix G. I used probes to clarify "the participant's definitions of terms, situations, and events to tap into his or her assumptions, implicit meanings, and tacit rules" (Charmaz, 2014, p. 95). My goal during the interviews was to create a balance between asking questions that I deemed important, while allowing participants to reveal what they thought was important (Charmaz, 2014).

Data management and analysis.

Transcription. I transcribed the interviews verbatim. All transcripts were verified three times for accuracy. I analyzed each transcript before interviewing another teacher to follow the constant comparison method of grounded theory (Charmaz, 2014). This allowed for an understanding of the data and the emergence of new themes and directions to be explored in the next interview.

Data storage. All interviews were recorded on a recording device and on an iPad mini. Both devices were used in case one did not record in entirety. Recorded interviews were labeled

with a pseudonym, transferred immediately to an external hard drive, and stored in a locked safe within my home office as approved by the University of Calgary Conjoint Health Research Ethics Board, ID REB14-0644. Interviews were erased immediately from the recording devices after I completed the transcriptions. Each participant consent form was filed in a separate folder and locked in the filing cabinet of the locked office of primary investigator Dr. Gayle Rutherford at the University of Calgary. As per the University of Calgary Conjoint Health Research Ethics Board protocol, data from the external hard drive will be erased five years after completion of the study.

Coding. After transcribing the interviews, I followed the methods of analysis as outlined by Charmaz (2014). For the initial data fragmentation, I used line-by-line coding of the interview transcripts (Charmaz, 2014). I emphasized the action in the data, and chose words or fragments of the participants' words to represent the concepts (Charmaz, 2014). I then used incident coding, scrutinizing the initial codes and the data, and identifying potential properties of emerging concepts (Charmaz, 2014). I wrote the incident codes in a column adjacent to the initial codes so that I could re-examine fit. When four interviews were completed, I then used focused coding to scrutinize the initial codes, sort, synthesize, compare data with data, codes with data, codes with codes, and then analyzed for conceptual usefulness and salience (Charmaz, 2014).

The constant comparative method involves making comparisons at each level of analysis (Charmaz, 2014). To promote interactions between the data, codes, categories, and concepts, I read and reread the transcripts and codes, establishing similarities and differences, seeking emerging ideas, and creating abstract connections (Charmaz, 2014). The constant comparative method also draws on relevant literature, studies, or theories to illuminate further understandings

or ideas for grounded theory development (Charmaz, 2014). I searched the literature to familiarize myself with terms or concepts as they emerged during the interviews and wrote memos to analyze their usefulness to the emerging theory.

Memos. Charmaz (2014) described memo-writing as "the pivotal intermediate step between data collection and writing drafts of papers" (p. 162). I found memos a necessary medium for clarifying my thoughts on relationships amongst concepts, deciding on subsequent interview questions, and for ordering my decisions on the emerging theory. For these reasons, I divided my memos into three categories. The first category was methodological memos, used to analyze decisions about how my research should be conducted based on the constructivist perspective. I wrote routinely and throughout the entire research process to make clear the multiple influences, assumptions, and standpoints (Charmaz, 2014). The second category I used was reflective memoing, anything that I was pondering or might warrant development at a later time. I used reflective memoing the most throughout the research process. The third category was for theoretical memos. I used this final category to diagram and visualize connections amongst concepts. I also wrote about the possible connections, testing relationships, and properties that I saw emerging throughout the interviews.

Reflexivity. "What we bring to the study also influences what we can see" (Charmaz, 2014, p. 27). I engaged in reflexivity as a conscious act of examining how my own interests, beliefs, and assumptions may have influenced my inquiry (Charmaz, 2014). I wrote memos at all times during the study process for reflexivity, an audit trail of decisions made, and as a method of analysis (Charmaz, 2014). Prior to beginning data collection, I wrote memos to clarify my decisions about the recruitment and interview processes, as methodological memos. I wrote memos after data collection as field notes, writing about my impressions of the interviews,

observations of the classroom, findings that could help me to recreate the scene of the interview, and thoughts and questions about my approach and future considerations. I also maintained reflexivity during each stage of the transcription process, again writing memos reflecting on the quality of the interview, as well as capturing words and questions that stood out. I included dates and titles on all memos to clarify when decisions were made, keeping the decisions grounded in the data (Charmaz, 2014).

Rigor

Charmaz (2014) contended that, "we need to consider our audiences… they will judge the usefulness of our methods by the quality of our final product" (p. 337). There is debate about how to portray rigor or *goodness* of qualitative research (Emden & Sandelowski, 1998; Streubert, 2011). Sandelowski (1993) argued that, applying too much rigidity may threaten the very context and sensitivity to meaning that is required by the qualitative researcher—which is to evoke the human experience that constitutes the best test of rigor in qualitative work. "The goal of rigor in qualitative research is to accurately represent study participants' experiences" (Streubert, 2011, p. 48). In efforts to follow the constructivist grounded theory methodology, I have chosen to use the guidelines put forth by Charmaz (2014) using credibility, originality, resonance, and usefulness to judge the value of my study's contribution.

Credibility. Streubert (2011) referred to two activities to establish credibility: 1) prolonged engagement with the subject matter, and 2) member checking–presenting the findings to the participants to see if they recognize the interpretations. First, in this study I believe I have achieved "intimate familiarity" (Charmaz, 2014, p. 337) with the topic of teachers using classroom PA. I performed all interviews, and engaged solely in the transcription and analysis process. For each interview, I completed an initial transcription, and then listened to the

recording three more times to ensure accuracy. To maintain trustworthiness in the data, after the first four interviews I requested my supervisor to review my transcripts and my initial and incident coding. I wanted to ensure that I was not directing the course of the interviews, but rather promoting the participants to speak about the areas they considered important. Additionally, I wanted to confirm that I was coding for actions in the data, and not what I inadvertently wanted to see.

I reached theoretical saturation after interviewing seven teachers, when no new items were introduced and the theory was well developed. This is often a judgment call on the part of the researcher, but also takes into account the context of the research and the researcher (Charmaz, 2014). I began to see theoretical saturation after five interviews, and continued to interview two more teachers, presenting the emerging model to the last two participants to see if they related to my interpretations of the data. The last two participants related to the concepts, and chose to comment on areas that had particularly resonated with them. No new properties were emerging from the interviews, hence, I stopped recruitment of new participants declaring theoretical saturation (Charmaz, 2014).

Originality. Research on the effects of PA on students in the classroom is not new, however, focusing on teachers' perceptions of integrating PA independent of an intervention study is under-researched. My theoretical model will be presented in chapters four and five. The emergent theory will offer a new conceptualization of teachers' views and potential ways to influence other teachers. For example, as will be explained in chapter five, self-efficacy may be associated with teachers who use PA in their classrooms. Hence finding ways of promoting teachers' sense of self-efficacy may foster use of PA, and may provide different strategies for targeting PA promotion.

Resonance. Charmaz (2014) recommended portraying the fullness of the studied experience, revealing *taken for granted meanings*, and asking whether the grounded theory makes sense to others. Key people felt that the study resonated with them: the teachers participating in the interviews, the Comprehensive School Health Lead (NH) whom I partnered with for recruitment, and resource groups who I had spoken with prior to submitting my research proposal. I believe that I have studied the fullness of the experience, as seen by the complexities of the teachers' examples and the subsequent model—there was no simple answer to teachers' instigating and sustaining PA practices. In chapter five, some taken for granted meanings may be perceived in a new light, with explanations provided from the literature.

Usefulness. Finally, my analysis and interpretations in this study will be helpful to teachers, and others working in the school system, trying to benefit students' health and learning. Teachers volunteered because they believed there was a need to expose the benefits of PA for children, and knew that many students and teachers alike could benefit from bringing forward their voiced experiences. Finding new ways to integrate health and education may be considered useful by Alberta Education who follow the Comprehensive School Health Framework, as well as by the Alberta Teachers Association to support teachers in their practices.

In summary, I have followed the constructivist grounded theory method to provide research that is trustworthy. I have taken steps to accurately represent the teachers' experiences, and meet the qualities for rigor as expected from the constructivist grounded theory methodology, particularly in areas of credibility, originality, resonance, and usefulness.

Ethical Considerations

Participants were provided with the consent forms prior to commencing with interviews and I explained and asked for questions regarding confidentiality and anonymity. Every attempt

will be made to exclude identifiers to the school and to the teacher. I obtained two signed consents, one for the study's retention and one for the participants' records (see Appendix H for consent form). I offered the participants the choice of a pseudonym, but none of the teachers took this option, so I assigned all names. I reiterated that participation was voluntary, and was not linked to their principal, school board, or employment in any way. Participants were made aware of their option to revoke their participation.

Conclusion

This chapter demonstrates the fit of the research question to the constructivist grounded theory methodology. I have attempted to outline my steps and decisions throughout the research process, and have indicated measures taken to ensure reflexivity, rigor, and trustworthiness of the data. In the next chapter, I will outline the theoretical model that emerged during the interviews, and explain the findings and relationships amongst the concepts.

Chapter Four: Findings

In this chapter, I will present the findings from the interviews of seven elementary school teachers. Through a compilation of their stories, I will highlight relevant observations and reasons why they have sustained their use of PA. The interviewees included one male and 6 females, and they were interviewed in the following order: Erik, Lucy, Helen, Amy, Lorie, Jennifer, and Lisa, as shown in Table 4.1. A theoretical model of *Teachers Prioritizing Physical Activity* emerged during the interviews (see Figure 4.1), and a summary of the factors and characteristics of the theory are shown in Table 4.2. Jennifer and Lisa were interviewed after the emergence of the model and they were asked for their comments and suggestions. Their remarks will be included in the corresponding sections, as I illustrate their experiences using PA. I will relate these findings to the extant literature in chapter five, and explicate how my model could be useful to influence other teachers towards similar practices.

Table 4.1 Teacher Information

Teacher Name	Gender	Years Teaching	Teaching Grade Level
1. Erik	Male	8	5-6
2. Lucy	Female	13	1-6
3. Helen	Female	7	2
4. Amy	Female	20	1-2
5. Lorie	Female	10	3
6. Jennifer	Female	24	5
7. Lisa	Female	4	2

Figure 4.1 Theoretical Model of Teachers Prioritizing Physical Activity

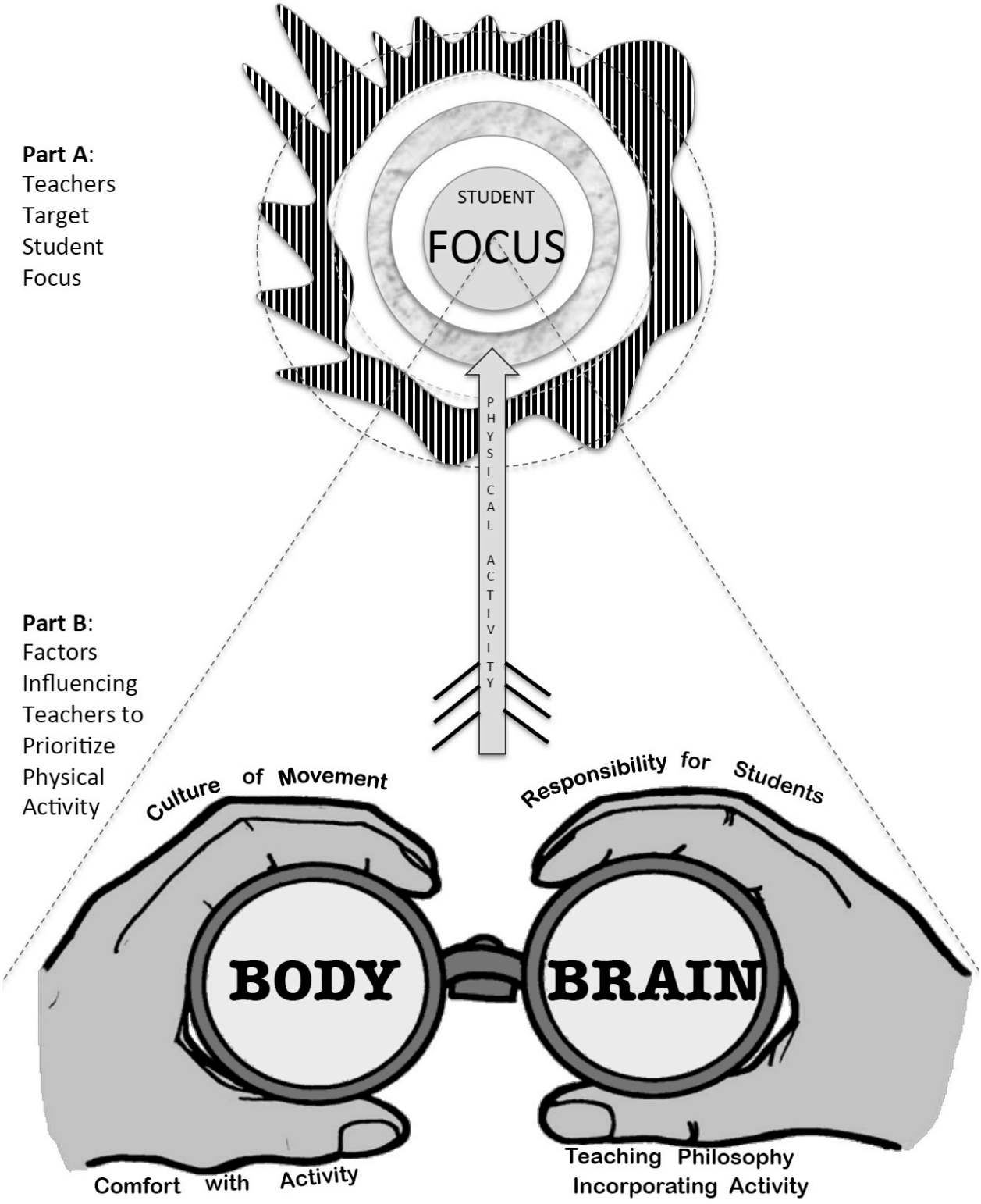

Table 4.2 Summary of the Model: Teachers Prioritizing Physical Activity

Part A:	Teachers Target Student Focus
Part B:	Influencing Factors on Teachers Implementing Physical Activity

Factor 1: Culture of movement
- A) Active school culture
- B) Developing a community of practice

Factor 2: Comfort with activity
- A) Active lifestyle
- B) Background experience

Factor 3: Sense of responsibility for student learning
- A) Personal responsibility for student learning
- B) Nurturing self-regulation
- C) Non-traditional teaching style

Factor 4: Teaching philosophy incorporating activity
- A) Physical activity is vital to the day
- B) Children learn best with physical activity

The model that emerged from this study is composed of two related components. Part A: *Teachers Target Student Focus*, is represented by a large bullseye—or target. Teachers resoundingly spoke of sustaining their implementation of PA because from their experiences, their students are more attentive and able to focus on their work following PA sessions. Part B: *Factors Influencing Teachers to Prioritize Physical Activity*, is illustrated with binoculars representing the teachers' lens. The body and brain connection strongly factors into how they observe and interpret their students' cues, as shown by the large words written at the centre of their sightline. Four factors influence teachers to use this lens, and are written on top and below the hands that are holding the binoculars. I will explain how these factors affect teachers, and how they relate to Part A of the model. I will discuss Part A in the next section, followed by Part B.

Part A: Teachers Target Student Focus

Part A of the model: *Teachers Target Student Focus* draws our attention towards the inner circle of a bullseye. It became clear as teachers recollected their experiences providing PA, that they were explaining *why* they used PA, and why they *continued* to use it. Teachers found that PA helped their students to focus on classroom activities, which overall resulted in better student learning.

The outermost lines of the bullseye are wavy, distorted, and asymmetrical, indicating agitation and disorder. If students are in this area of the bullseye, they do not necessarily know what to do to feel better. Teachers understood that learning was not occurring because their students' needed to move. The teachers provided varied descriptions of student behaviours indicating they were in the outer portion of the bullseye.

Teacher attunement to student cues.

Erik related that he recognized students needed PA when they were *"zipping around the classroom, bothering other people or just not staying focused on their task," "rambunctious," "wired,"* or had *"unfocused energy."* Lucy said, when the students are not engaged they are *"drifting off, day dreaming."* Amy explained, *"When I'm not on my game about that [PA], I know. Cause my kids are crazy!"* Lorie described, *"chaos," "[the kids are] antsy," "… they cannot sit for longer than 20 minutes without bad things happening,"* and *"…starting to see them getting frustrated, they're tired… they're really high [in energy]."* Jennifer referred to it as *"everybody's off," "agitated,"* and *"[we're] losing our mind[s]."* Lisa identified a difference in cues between the genders, *"Girls… I guess… it's like a passive disengagement, whereas boys tend to jump around a little bit more—it's more obvious that they're not [paying attention]. Like the kids are done!"*

When students are in the outer zone of the bullseye, learning has stopped. If the diagram appeared in color, this outer zone would be red, analogous to a stop sign. Similarly, the inner circle, titled *Student Focus*, would be green, analogous to a green traffic light signalling *go*. Learning, defined as the acquisition of new knowledge (learning, n.d.), occurs when students are in the inner circle and are able to *focus* on classroom activities. Lisa described that learning can only occur if the students are properly tuned in. *"This year, these kids are really good at making it look like they're paying attention, but if they're tuned out it's so obvious later on [the content was not learned because the students had not been attentive during the teaching]."* Lisa's statement illustrates students in the outer zone of the bullseye, who are trying to appear focused. The adept teacher realizes that when students are not in the inner zone—and fully focused and engaged in their tasks, learning is not occurring.

Teachers provided a variety of PA interventions and capitalized on available spaces beyond their classrooms. Jennifer incorporated the whole school as useable space. She asked some students to "deliver supplies" to other classrooms when only individual students needed to move. Erik and Helen brought their students outside to run in the field; Amy, Helen, Lorie, and Lisa provided extra time on the playground; and Lorie, Erik, Jennifer, Helen spoke of using games inside and outside. Duration and intensity levels of the PA varied. Teachers did not seem to have a formula for providing the PA, but continued to read the signs from their students and respond. Erik stated, *"I don't know if anybody's ever found that magic ah… well how much activity… or when, or what works. Cause what works for one kid doesn't work for another kid, right?"*

Lorie used games such as "capture the flag," but also spoke about using warm up drills from her coaching experience,

I tend to do like little drills from my basketball [coaching], but they seem to like it. It's called "Firefeet," and you just go like this, you know [showing a hoop shot with her hands]. And Jumpshot! And they all take the shot! And they all fall! And they seem to like it, so… little activities. Sometimes it's as simple, as like - OK everybody touch 3 walls and then come back!

Jennifer incorporated many different strategies such as integrating PA with mathematics, where there were actions for certain numbers. She also used "*desk push ups. I do desk push ups with the kids all the time."* Lisa took advantage of the outside amenities, the playground, field, the concrete pad, the skating rink, and even took her students for walks around the surrounding community. Erik initiated morning walks before he began teaching, while Helen created natural breaks in lessons, and used activities such as walking around the carpet, yoga or heading outside whenever possible. Teachers were creative, and found that their students thrived with a variety of activities, leading to better focus on their work and improved ability to learn.

Focus and better student learning.

Teachers' overall intent in using PA was to prompt better student learning through focusing their students' attention. However, while all teachers used the word *focus*, some teachers elaborated on the quality of learning or the *true* learning that resulted. Lucy explained her view,

Kids lose focus if you don't change it up. So… the variety is the important aspect, but the movement um, I just noticed after time… that if you could alternate between some quiet focused time as a class sitting at the carpet with some direct instruction, with getting up and moving around. Just the um results of that were better learning. Were more focused.

I asked Lucy if there was any other way that she might describe the results of including PA. She responded,

> *Promotes enjoyment. Um, I think engagement would be the key. Because when your students are engaged in what you're doing, instead of drifting off, day dreaming, then that's when the learning, the true learning happens. And I think that getting up, moving around really promotes their engagement.*

Erik elaborated on the *quality* of learning,

> *I mean this is just my own personal opinion. Um… when it comes to physical activity I think people know that it's important, but ah, they feel that… well if we're missing out on say 10 or 15 minutes of reading for physical activity, well if we're in school maybe that's not a good thing. But… if you take 10 or 15 minutes out, the quality of learning you'll get afterwards is usually better than spending that extra 10 or 15 minutes, right? You get better quality rather than just quantity… but I don't think a lot of people understand that.*

I asked Amy what she thought the benefits of PA were for her students. She responded, *"Life is so much easier! …What's the benefit? God! What isn't a benefit? The kids are more calm, they're more focused…"*

Once teachers initiated PA in their classrooms, it was sustained because of the end result: increased ability to focus and better student learning. Lorie suggested that observing and interpreting students' behaviors as a signal for PA, could be the influence of using a particular lens. In the next section, I will present four factors found to influence the teachers' lens.

Part B: Factors Influencing Teachers to Prioritize Physical Activity

During the interviews, Lorie made a compelling claim that her interpretation of what her students needed, may be influenced by her own needs. She explained,

Everything's through my lens so when I say that they [the students] get antsy, and I can tell they need to move - I don't know if that's the objective truth or if that's me… I probably need to move. I know that it makes me feel better.

Part B of the model is influenced by Lorie's suggestion, that teachers who incorporate PA may observe and interpret their students' readiness to learn differently than other teachers. Hence, the binoculars with the bolded words *body* and *brain* written across, represents the lens through which these teachers may be viewing their students. Note the direction of their gaze is focused on the central circle of the bullseye, clearly following the arrows labelled PA. The hands holding the binoculars are surrounded by four factors steering teachers towards instigating PA, and sustaining it. These factors are a: 1) *Culture of movement*, 2) *Comfort with activity*, 3) *Sense of responsibility for students*, and 4) *Teaching philosophy incorporating activity*. I will explain the relevancy of the factors through the teachers' words, and in chapter five I will provide further context through the literature.

Factor 1: Culture of movement.

Belonging to a *Culture of movement* appears to be the most influential of the four factors. I chose the word *culture* for its connotations of a group mentality: "The ideas, customs, and social behaviour of a particular people or society," (Fowler, 2015, p. 197). "Culture is learned and shared within social groups...[and encompasses] behaviour patterns… beliefs… work and thought" (culture, n.d.). Teachers who spoke about their schools as altogether embracing PA, provided examples of a group mindset towards common goals for their students. I coined this element A) *Active school culture*. Teachers who did not experience the same cultural mindset towards PA in their schools spoke of seeking educational opportunities at Teacher's Convention, creating opportunities to observe peers, and joining *virtual support*

groups through social media – Twitter. I called this element B) *Developing a community of practice*. I will illustrate each of these two elements, demonstrating the importance of a *Culture of movement* as an influencing factor on teachers' prioritization of PA.

A) Active school culture. After hearing Amy and Lorie describe their schools, it became evident that the most important element influencing and supporting teachers to provide PA was the school environment. Lorie and Jennifer both described belonging to school environments that had an *Active school culture.* Amy started her career at a school that embraced a culture of movement, but noted that at least two other schools she worked in did not have a *whole* school approach to PA. Hence, she could compare and contrast a school that had worked together at implementing PA, with schools that held different priorities. Schools with a culture of movement had administration supporting strategies for all the staff to participate and encourage PA. Teachers talked formally during staff meetings, planned whole school physical activities, staff modeled games and easy PA strategies, and on professional development days occupational and physiotherapists taught specific movements for teachers to incorporate into their classrooms. The activities most influential were those involving the whole school and did not allow for teachers to decline participation. Lorie provided an example where the whole school promoted activity together,

> *We have this thing called, "Bazinga," where the assistant principal will say, "Bazinga!" on the intercom, and what that means is every teacher must drop whatever they're doing and walk outside the classroom and into another random classroom where there was no teacher, and like at this time we had to dance with the kids. So like that song Happy was playing. And so they were like, "Bazinga!" And the kids, they know what's happening, and they were like, AH!!! Hee, hee, they're just waving at you! And you're like, I'm new*

here, I don't know any other class. I just ended up in this grade two room, and the grade twos are so happy to dance with you! They don't know me! But they just, they just come over and start dancing, and they're so excited!! And it gets you to know the other classrooms… I think culture's pretty big. I think role modeling's pretty big.

Lorie spoke of gaining new PA ideas from other teachers, so I asked her if she had opportunities to observe her peers teaching. She responded,

We do, because we're around each other all the time… Um, we work pretty closely with the other two grade three teachers. We plan together. So, sometimes… in PD [professional development days –when students have a day off and the teachers are provided specialized instruction on topics and given time to plan]- we do it together. Like a teacher will do it for the teachers [model a PA break]. Like "OK, I think we need a brain break, I think we need to stand up." And then what they're doing with you— you do with your kids. So I would say they role model what you can do with your children– you do with your staff… But, it also does feel good as an adult right? It was neat, but it was neat how we were allowed to use that PD time for hands on stuff that we could directly take to our classroom. And then we did sit down and debrief...

Lorie provided an example of being the new teacher joining an *Active school culture*. She explained how she valued PA and knew that she was interested in incorporating it into her classroom. However, she did not anticipate the immediate expectation that she share an idea for a classroom PA at a staff meeting. She recalled that powerful moment when she showed the You-Tube video "Just Dance," and the staff just got up and danced to the music, trying to relate to the activity as their students would. She felt that the school culture promoted PA to the staff,

and she was prompted to implement strategies immediately, rather than first finding her comfort in the school, in the classroom, *and then* in implementing PA. She elaborated,

> *I think culture has a big part to do with it… When I first came here it was hard for me to just jump into those activities… [but when] you see other people doing that and taking risks [trying new PA strategies], you're more likely to take risks like that.*

Another key feature of an *Active school culture* is a whole school approach, and a shift from *my* students to *our* students. As illustrated with the words "*BAZINGA!"* shouted over the intercom, teachers get involved with all the students within the school, not just their own classes. Jennifer remarked, *"We're becoming increasingly "our" students not "my" students in this building."* She explained that teachers need to engage in conversations, problem solve, and learn from each others' expertise because of the increasing student diversity within a classroom, such as reading levels in Jennifer's class ranging from grades 3-10, and problem solving for students' activity needs. Amy held a similar opinion, feeling that schools should use a whole school approach, and act as communities of learning rather than separate classrooms.

In contrast to Amy, Lorie, and Jennifer's accounts of teaching within an *Active School Culture*, where teachers discuss and plan their PA strategies with their peers, is a concept I called *Teaching in isolation*. When I asked Erik, Lucy, Helen, and Lisa how their peers provided daily PA, they remarked, *"I have no idea what the other teachers are doing."* Erik explained that teaching is often isolating. There may only be brief opportunities to glance into another teachers' classroom while walking down the hallway. Some teachers felt this was limiting to their use of PA, because staff generated excitement when working towards similar goals.

Having an *Active school culture* makes expectations clear, and provides supportive practices. For example, Lorie explained that in her school, a "Fresh Air Break" was an

afternoon outdoor recess occurring whenever it fit with the class' schedule. The provision of the break was an expectation within the school, but the teacher was given the flexibility of how and when it would occur. In contrast to the cohesiveness at Lorie's school, was the isolated dynamic at Lisa's school. Through experimentation, Lisa realized that her class worked better in the afternoons after they had an outdoor break. However, despite approval from her principal and confidence in her rationale, she still felt a discomfort that other teachers would question her practice. An *Active school culture* creates awareness amongst teachers and support for best practices.

An *Active School Culture* may be an effective strategy for influencing teachers to incorporate classroom PA immediately, eliminating a *lag time.* It appeared that in teachers who incorporated PA strategies, there was often a gap between when they began their careers and when they incorporated PA into their classrooms. Teachers provided rationale for why there was a gap, such as first gaining confidence in their teaching and classroom management skills (Helen), and even forgetting about the importance of PA (Erik). Jennifer speculated that new teachers first want a permanent contract before they would be *brave* with their classroom strategies. She explained,

> *There's definitely a lag time. I think you have to find your personality in your classroom. You have to figure out where you're prioritizing curriculums. It takes... Well first of all, it takes a permanent contract before you'll be brave, right?*

The ideal environment for incorporating PA may be within an *Active school culture*, where there is a sense of community in working together towards defined goals. When teachers are working in isolation, teachers must be careful of disrupting other classes, they do not know whether their peers are implementing the policy of daily PA, and they do not advance their

knowledge of PA strategies that are working for other students within the school. When teaching in isolation, classrooms are segregated, and teachers do not learn about other students in the school. Creating an *Active school culture* may bring other benefits to the school in addition to increased PA for its students, such as increased camaraderie amongst peers, increased overall functioning of the school, and perhaps increased job satisfaction.

B) Developing a community of practice. *Developing a community of practice* is the second element of the influencing factor, *Culture of movement* and is a term borrowed from Wenger (1998). Wenger described communities of practice as learning through a social environment. He contrasted our traditional thinking of learning as being individuals in a classroom, to learning that occurs in the work place through social contact (Wenger, 1998). The teachers that I interviewed who were not working in schools with an *Active school culture*, spoke of ways that they were developing connections, in alignment with Wengers' communities of practice.

Lorie spoke enthusiastically about the connections she made and the ideas gained through the virtual community of Twitter. She explained that prior to employment at her present school, she was seeking information,

> *There's circles of teachers that talk a lot, right. Twitter's huge for teachers. Have you ever looked at teachers' Twitters? They're massive! They do so much individual PD [professional development] through each other on Twitter. There's a whole realm of outdoor educators in Outdoor Ed. [education] that I follow on Twitter. I was like a junior high teacher reading these kindergarten teachers tweeting like amazing ideas, right? That I was really interested in… that I wanted to try—probably from listening to them talk to each other on Twitter.*

Teachers described their communities of practice anecdotally, but with ascribed value and consequence. Perhaps the teachers did not know the full capacity of the connections they were developing because they were not *labeled* as groups or supportive practices. For example, Lisa spoke about the power of her staff walking group,

> *Like some of my friends and I, we walk until the first bell rings. It was really hard for me to get started in it. I was like, "No, I've got things to do…" And I've been going lately, but today I was so tired. So, I was just, "No, I just want a coffee. I just want to sit and go over these notebooks," [They said], "No Lisa, come!" I came back - I was no longer tired! That might be the secret of breaking my caffeine addiction! Going for a walk every time you need it (laughing).*

The walking group supported a practice that improved Lisa's state for the remainder of the day. The group may have been informal, but they still made it difficult for her to decline their regular practice.

Erik's efforts towards *Developing a community of practice* encompassed his desire to promote PA opportunities to students in other classes. He explained trying to draw in more staff,

> *Ah usually whenever I run a club, I never run it on my own. I always find someone else to help me. Ah, I was fortunate in my last school that ah, I became good friends with another guy who had...um... He didn't have a physed background... He's just always been athletic his whole life, and loves sports, and… We used to do things together.*

While Lisa and Erik exemplified informal partnerships with people within their schools, Amy described attending classes overseas where she found other like-minded people who shared her passion for PA integrated with curriculum. In the same way that partnerships are helpful for

extending the reach of PA amongst teachers, so is exposure through observation. Lucy described experiencing new ideas on how classes could be taught,

> *I did visit, um another teachers' classroom at one time who was known in the district. This was when I was teaching in B.C. He was known in the district to have this awesome program, and kids were really enjoying it… So I went to this guys' class, just to observe. And he… had all these activities. He might have had 4 activities in the course of one class. And some of them were—get up and dance. Some of them were—play your instrument. Some of them were—sing. Like, he just was changing it up all the time (snapping fingers). And those kids were having so much fun that I sort of internalized that there needed to be more variety… in my… teaching. And movement of course is a big part of that.*

Lisa related a similar story of a change in thinking accompanying observation. She explained,

> *So last year I team taught with another teacher who's quite a bit more experienced than I am, and he—he always like tried to play games and stuff in between lessons… And I really picked up on the difference, because… I had only really observed me in my classroom in elementary school… So when I saw him teach and the difference that those movement breaks made on the kids, like first I was like—oh my God!*

Hence, whether through the school, or through other social practices, establishing a *Culture of movement* appears as an influencing factor to teachers implementing PA. When there was an *Active school culture*, there was no lag time between when teachers began their careers and when they started including PA into the day. However, teachers who were not employed at schools with an *Active school culture* indicated that *Developing a community of practice* was

another way of gaining exposure and support for their PA practices. Increased opportunities for learning may serve as springboards for new practices. Hence, creating a mentality around movement and sharing practices with other teachers may be a necessary step towards supporting teachers instigating and sustaining PA in their day-to-day practices. The next section focuses on the second influencing factor, *Comfort with activity*.

Factor 2: Comfort with activity.

Feeling a *Comfort with activity* is a second key factor influencing teachers to prioritize PA in their classrooms. Jennifer was the second last teacher interviewed, so I asked her to look at my emerging theoretical model. She drew my attention to this factor, explaining that these words, *Comfort with activity*, brought to mind an experience she had encountered at an in-service. She recalled her peers requesting the occupational therapist to write down the *exact steps* suggested for movement strategies in the classroom. Jennifer interpreted that the teachers didn't seem *comfortable* just hearing about the activity and adapting it for students. In order for these teachers to incorporate movement, they needed to follow written instructions. Jennifer's example may be an important illustration of feeling comfortable with incorporating PA into the classroom. I found two elements associated with teachers feeling a *Comfort with activity*, A) an *Active lifestyle*, and B) *Background experience* using PA with children. I will describe each of these elements with examples provided by the teachers.

A) Active lifestyle. Common sense seems to dictate that teachers who are personally active would be the most likely to implement PA in their classrooms. Upon completing the interviews for this study, all seven teachers related to having an active lifestyle, now or in the past. Two teachers - Amy and Jennifer were not presently active, as they were limited by chronic disease and a recent injury. Activities teachers engaged in were: hiking, biking, running,

triathlon, swimming, walking, yoga, floor hockey, and basketball. They preferred an *Active lifestyle* for reasons of: enjoyment, health maintenance, diagnoses requiring PA, and raising an active family.

While it is true that teachers who implement PA in their classrooms seem to be themselves physically active, it does not necessarily follow that all teachers with active lifestyles will bring PA into their classroom environments. However, having an *Active lifestyle* may provide a *Comfort with activity* that increases the likelihood of leading and participating in PA with students. In addition, teachers who are physically active may attribute value to PA for themselves, and so they may also see value for their students.

Teachers described reasons for valuing PA. Erik stated, *"I used to be a life guard and taught swimming lessons and stuff, so it's always been something that's been a big part of my life."* Lucy related a value to her fitness class, despite often dragging her feet to get there. She explained, *"When 8:00 rolls around and my class is over, and I'm driving home—I just feel like a new person. Yeah!! It's huge! So I always try to remember that! (laughing) You'll feel better when it's finished!"* Amy stated, *"I wish the same benefit [the ability to move] was given to me as an adult in a meeting."*

Teachers who are routinely active, may interpret that their students will also feel better if they receive PA, and may observe that need during the school day. Jennifer related her frustration when she is forced to sit for too long,

I've said this a million times on PD [professional development] days and Teachers Convention. I would NEVER make my students sit for 6 hours, and yet I'm expected to do it on a pro PD day. I think it's intolerable… and yet they do this to us all the time. And yet we are an occupation that doesn't sit still.

Erik related the same feeling,

> *I just know for myself that when you're sitting there for a long period of time… you know like we've all been in those two hour lectures at U of C or wherever you're at, and you're just dying after awhile, right? You need to just get up and move and stretch or you start to lose your focus, so...*

Lorie stated, *"I know that it [PA] makes me feel better… I think a lot of it has to do with your life, right? So, I have always reacted better when I've been physical and so that comes out in my class."*

Lorie described playing sports when she was younger, then continuing on to coaching. In her teaching role, she valued PA as a relational strategy with her students, an anchor used throughout the day. She called this using PA *as a metaphor for life*. Lorie illustrated the classroom as a small space with a lot of people working within it every day. She stated, *"To be in a classroom with that many people all day every day is pretty insane when you consider most adults wouldn't do that, right?"* So she used games such as "Capture the Flag," challenging her students to tackle problems by working together. Later in the day if they were struggling with a math question, she would re-visit a situation from the game. She discussed with the students how they persevered or sought out other resources. Lorie saw value in PA as meeting her teaching goals. She had a *Comfort with activity*, and saw the benefit of helping her students relate to learning in this way.

Lucy valued PA in the classroom as an engagement strategy. She wanted her students to leave her class saying, *"I had a great time today."* She explained,

> *I would venture to guess that the kids—that's their favorite thing… in my class… They enjoy getting up and moving around. I think they need to, and they like it. So…um, it's*

partly for me to keep them focused and keep them learning, but it's also for their enjoyment too.

Hence, PA met Lucy's goal to create an enjoyable learning environment, while also making her teaching time effective as the students were focused.

Closely associated with having an *Active lifestyle*, is having *Background experience* using PA with children. I will introduce this second element in the next section.

B) Background experience. Most teachers related a previously positive experience with children and activity that influenced bringing PA into their classrooms. They revealed previous jobs with children where PA was an effective tool for initiating enjoyment, fun, or a change in mood. My intent in the interviews was to elicit teachers' defining moments when they had trialed classroom PA, instead teachers shared their *motivations*. Perhaps teachers were motivated by previous successes using PA with children, and their subsequent comfort levels dominated their recollections over their first trials of PA.

Lorie described PA as her *go-to*, explaining she had an internalized bank of ideas from past jobs as drama leader, camp counsellor, and coach that she called upon during transitions. Helen described working with adolescents in group-homes who experienced positive changes upon taking a walk. Jennifer described her work with preschoolers as foundational for incorporating PA throughout the day. These past experiences are important, because teachers described a *Comfort with activity* from past exposures, capitalizing on the previously learned successes. The following are some of the teachers' examples of having previously positive experiences using PA with children.

Lorie stated that PA wasn't something she had to think about using. If she felt the students were stuck or needed a transition, she went to something she had previously experienced as being positive with children. She explained,

> *I would say because I had more experience in that area [PA], it was my go-to. Right, like that's what I felt comfortable with… Like I would lean on it… I would say what's helped me… was being a camp counsellor. I look back on that experience as being pretty instrumental. I use a lot of those games as a camp counsellor to get me through those lag moments [now as a teacher]… It would've been like [if] I felt like a lesson wasn't working and I would've had a positive experience with those activities usually from a camp, right… Where I see children enjoy themselves, where I see them engage…and to be present in the moment. So sometimes when they're working on something you can tell that they're just not present and so you want to bring them back a little bit. Um, yup, engagement is pretty big.*

Helen explained her previous experience with children at an adolescent group home, *"You know you're spending all day every day with them sometimes. And moving would provide them with a change of scenery, get the blood moving around… Just kind of change perspective sometimes…and so I think that stuck with me."*

Helen explained yoga was her the activity that she felt most comfortable using in the classroom,

> *I know over the years, the knowledge has ebbed and flowed in my brain of like organized competitive games. Because I don't teach physed now, and it's been 2 years - 3 years now, and I'm forgetting them… So then I'll revert back to my knowledge of yoga, or I use "Just Dance" because I love it.*

While most teachers had gained comfort from previously using PA with children in different environments, all teachers also shared a third factor that influenced their use of PA in the classroom. All teachers revealed feeling a responsibility towards their students to impact their learning. I will illustrate Factor 3: *Responsibility for students* in the next section.

Factor 3: Responsibility for students.

When teachers provided examples of using PA, they also provided evidence of feeling a responsibility and accountability to their students. They illustrated many challenging situations and their perseverance to find solutions for their students. They owned these challenges and were proud to share them as successes. Furthermore, these teachers conveyed a sincere desire to impact *all* students, not just those within their classroom walls. Their rationale for volunteering for this study was related to feeling a responsibility to help students not receiving the benefits of PA—in other classes and at other schools.

There are three elements of teachers feeling a sense of *Responsibility for students*: A) *Personal responsibility for student learning*, B) *Nurturing self-regulation*, and C) a *Non-traditional teaching style*. Each of the three elements has important contributions to teachers feeling responsible for their students, but all three are linked and overlap. I will explain the elements using the teachers' words.

A) Personal responsibility for student learning. Teachers spoke proudly of the challenges they undertook for their students, conveying a strong sense of responsibility towards their students' learning. Some may argue that all teachers must be responsible for their students' learning, but I got the impression that these teachers took particular pride in their efforts. They reflected on the learning they gained and the resources they called upon. They did not complain about their class sizes, administration, or the number of students with special needs. Instead,

they spoke of the following three characteristics: problem solving, reflecting on practice, and self-educating.

The teachers provided many examples of problem solving to meet their classes' diverse needs. They seemed open to trying different strategies and establishing innovative practices. I asked Amy if she thought she would have implemented classroom PA if she had not first been employed within a school that had a *Culture of movement*. Amy established her commitment to problem solving for her students,

> *I think because it's innate to me to move… I would have [eventually used PA in the classroom], but I probably wouldn't have known—had the skill set, because I wouldn't have had the exposure to the expertise… Um… knowing me as a person, probably I would have figured it out. Only because if there's an issue that I see that's going on, I go and investigate that and research it and study. And go… well what is it that's happening for this kid and this kid and this kid? What do I need to do differently?*

While teachers were proud to share stories about their problem solving strategies using PA, they also spoke about reflecting on their practice. Lisa reflected on a trial run of providing an afternoon snack and PA break, subsequently deciding that she would continue the practice permanently because of the beneficial teaching results. She explained her reflection at that time, *"So 10 minutes was up and we sat down. And they just kind of blew my mind. So I said, "OK, what if we had afternoon recess [every day]?""*

Erik explained his self-reflecting practice,

> *I think a lot of it was just me looking at my own practice. And just becoming more aware—looking at the cues and signs from the students, and then just, again, remembering how important it is. Right, cause at the beginning of the day, the kids are*

still fresh and stuff, but you know, deciding to want to start off a day that way [going for a walk], that's sort of my decision.

The teachers also related their self-educating practices. Teachers demonstrating a commitment to their students' learning by problem solving and self-reflecting, were also self-educating. As already mentioned, Lorie stated many teachers self-educate through Twitter, learning new ideas, strategies, and even setting up meetings with teachers from other schools to learn from their expertise. Erik spoke of attending weekend courses. Amy, Lorie, and Lisa searched the internet regarding students' diagnoses. Helen spoke to colleagues and obtained journal articles supporting her yoga practices. Amy and Jennifer spoke to specialists, and Lucy, Amy, and Jennifer earned their masters degrees. Self-educating teachers may be intuitively researching practices that support and nurture the needs of their students. In the next section I will discuss teachers nurturing students' self-regulation.

B) Nurturing self-regulation. The second element of teachers showing a *Sense of responsibility for their students*, is *Nurturing self-regulation*. The teachers were aware that students had *needs* that required a response before learning could occur. Activities such as PA helped the entire class to focus, but some students required individual attention. Teachers spoke about working with these students to develop awareness and strategies to meet their needs. Some teachers may be especially sensitive to recognizing and developing strategies to help students regulate their needs. Regulating strategies often included PA (Erik, Amy, Jennifer, Lisa).

Teachers provided examples of the complex needs of some students. Teachers implemented strategies with the goal of helping those students develop self-regulating behaviours so that they could effectively learn in the classroom. Amy stated that from her

experience, it may be up to the teacher to nurture that awareness and provide the means to a safe and appropriate response. She explained,

> *So what we were doing was we were trying to give them an avenue where they could take that physical aggression [or other inappropriate action] they had and deal with it in an appropriate way, right? So giving them tools that would let them do that. One of our dreams for this school is to have a cycle bike down in one of the mud rooms so they can just go and burn it off, right? The ultimate goal is to get them to self-regulate, but young kids don't often know in the beginning. Any kid—even adults, let's be honest… So in the beginning we're setting it up—and you're feeling this way, these are your options. You do it pro-actively, and then eventually they can start choosing it on their own. Sometimes they're still directed, but they'll choose it on their own.*

Jennifer elaborated, emphasizing the importance of building a trusting relationship, but also the extent to which she will go to nurture students' ability to self-regulate.

> *I'm not bothered by you listening to your body and doing what you have to do in my classroom. So if that means you're lying on this carpet... As long as I see work happening at the same time. They [the students] learn they're not really chained to their desks in here... But I do see changes immediately. In the little changes that I do environmentally. Um…for the kids that have the legs that have to move all the time and things like that… Ah, being allowed to move your space is huge. Like this little guy… He moves probably– physically moves work spaces probably 6-10 times a day. Either the work he's working on goes with him, or it's a change of learning activity. But the fact that he knows he can do that tends to A) have him being redirected less frequently by me, [and] B) his success or the amount of work that he completes tends to increase. And*

everything about our relationship as teacher and student is a bit more harmonious, because I spend less time harping at him.

Lisa extended her example of self-regulation to the whole class stating, *"They [the kids] ask to go to the bathroom, but they don't even know why. They just know their bodies need to get up and do something."* Whereas, Jennifer described having students *deliver packages* to the office when she saw *individual* students needed to move. She even made changes to the environment to assist students. She spoke of purchasing different lighting for students that were sensitive to the buzz of the fluorescent lights. This is a non-PA example, but pertinent to demonstrating the extent that these teachers will go to nurture their students' ability to learn. Jennifer's examples of a non-mainstream approach to teaching leads to the third element of a *Sense of responsibility for students*, using *Non-traditional teaching styles*.

C) Non-traditional teaching style. Favouring a *Non-traditional teaching style* is the final element of the *Sense of responsibility for students* factor. Jennifer commented, *"There are teachers—where what goes on in my classroom would probably pretty much push them over."* Teachers spoke proudly of their flexibility and tolerance in order to meet the needs of their students. Erik illustrated his self-awareness, and felt that his methods were unlike other teachers,

Part of that is just my teaching style… I'm a little bit, ah, more tolerant of noise and movement within the classroom. So I'll typically have students getting up and moving around, and some are studying here and doing work over there and stuff. And some other teachers like it a little bit more quiet and structured…

Teachers related a flexible teaching schedule in order to meet their students' needs. Lisa laughed, stating that she gave up using her timetable by Christmas. Jennifer stated that she taught her students based upon their interests and needs, and that no one year was ever taught the

same way. Amy related that in using PA, she adapted to what the students needed at the time, rather than inflicting her schedule onto them. She explained,

> *You're gauging—what's the energy like in this room? If everyone's on task and focused, right? [Then] I let that be, right? So it's not like I say every morning I'm gonna do this, and I'm going to do 3 or 4 of them [physical activities]. If they're really wired, I'm going to do more. I'm responding to what's happening with them.… There is energy that's not working here, and there's a need for movement.…*

Teachers using PA in their classrooms may recognize that in order to teach effectively, they have to operate in a state conducive to their students' needs. Teaching with flexibility, adaptability, tolerance, and incorporating methods less associated with traditional methods such as PA, may optimize their students' ability to learn. This is in contrast to teachers following their own pre-determined schedule, or relying on what has worked in the past. Using PA in the classroom may not only require a *Non-traditional teaching style*, but also a *Teaching philosophy incorporating activity*. I will discuss the role of teachers' philosophies related to PA in the next section.

Factor 4: Teaching philosophy incorporating activity.

The final factor influencing teachers to prioritize PA in their classrooms is a *Teaching philosophy incorporating activity*. During the interviews, some of the teachers reflected upon their foundational beliefs guiding how they taught. Jennifer described her teaching philosophy as *generative*, building upon her students' interests. She explained that integrating PA into the classroom worked the same way as when she extended her students' intrigue with the Maritimes during social studies, into math and art as well. All the teachers conveyed a strong belief that PA was a necessary component to the day, and intricately linked with children's learning. Two main

beliefs comprise a *Teaching philosophy incorporating activity*: A) *Physical activity is vital to the day,* and B) *Children learn best with physical activity*. I will illustrate these beliefs with teachers' examples.

A) Physical activity is vital to the day. Teachers spoke of the necessity of including PA during the school day. They felt it was unreasonable to expect students to sit for long periods of time, despite receiving daily recesses, lunch breaks, and sometimes physical education. They felt PA was invigorating, affected mood, and helped keep the brain active. Lisa spoke of her frustration with peers providing excuses for skipping physical education,

> *Yeah, really I get—or I've got in the past, really angry at some of my… coworkers. Um, just because, you know they're like "Yeah we didn't have time for gym today." And um… I don't know how they [the students] can function to be honest. Because, if my kids… like sometimes we have "gym" twice. Like sometimes we have afternoon recess... We do movement things in between, and this class isn't even as difficult as the class I had last year. And if they missed - if they needed a movement break and they didn't get it, like… It doesn't matter what you think you're teaching them, they're not getting any of it. So I, I do get really, really upset with some of my [coworkers]… And I guess in the last couple years I've learned to be more professional about it, which is why I laugh. But um… I do get really upset with my coworkers if they, if they don't give… not just the 30 minutes of the daily physical activity, but… Like I'm not, I'm not really excited about gym, but I don't think that's an excuse. So I'm really opinionated about this.*

Helen voiced her disbelief that there *were* teachers who did not provide PA breaks. However, Amy, Jennifer, Erik, and Lisa had strong convictions that there *were* classes who were missing out on PA during the school day. Lisa speculated that perhaps teachers who were *not*

incorporating PA had not seen the benefits that PA brings to the class, or had never had a student who is *"…jumping up and down and being that jackhammer around the class. Maybe they [the other teachers] haven't had someone like that to realize it [how PA helps]."*

Amy suggested the problem of not including PA during the school day may be a belief in Cartesianism, where items are separate and compartmentalized. She explained that people *speak* of the mind-body connection, but treat them as separate entities—not necessary components occurring together for optimal functioning of both the body and the brain. Many of the teachers felt that PA and childhood learning went hand in hand. In the next section, I will describe another teachers' belief, that *Children learn best with physical activity.*

B) Children learn best with physical activity. Jennifer articulated, *"So what I know about little children and body engagement and the way they learn - sort of informs your practice forever."* Jennifer taught preschool before making a career change to grade school, currently teaching grade five. She has a firm belief that children of all ages need PA to learn. Other teachers held similar philosophies towards teaching children. To these teachers PA was not just a healthful practice; they believed PA conducive to learning. Teachers spoke about using PA to foster engagement through enjoyment, to aide kinesthetic learners to internalize their learning, and as a strategy for language acquisition.

Lucy, Helen, and Lisa spoke of using PA as a tool to reach the different types of learners, especially those that were kinesthetic. Lucy illustrated teaching kinesthetically in music class to help her students differentiate between the beat and the rhythm. She played music while her students stepped onto pictures of the heart to feel the *pulse* of the music. Then they clapped the rhythm, which she described as the words of the song. She explained that to feel the rhythm with their bodies helped to internalize their understanding. She stated,

So I'm teaching them rhythm, but I'm getting them to feel it with their bodies. Cause some kids you could maybe just do it on the board and point to the beats. How many sounds is that? But, if they can actually do it with their body, I feel like they can really internalize it better. So it's not just you know teaching a square dance or, or doing a circle game of some sort. It's also just that movement helps them internalize their learning. So I try and do things like that all the time to pull in those kids who don't necessarily get it just from hearing it or seeing it.

Lisa acknowledged specifically targeting kinesthetic learners, but also used PA for its benefit in helping *all* students when learning another language. She remarked, *"Body movement is actually really, really important."* Lisa recalled researching two programs, *Lively Letters* and the *Total Physical Response Technique*. Lively Letters primarily focuses on learning to read, and incorporates hand and body gestures, stories, songs, and imagery to letters and sounds ("Lively Letters," n.d.). The Total Physical Response Technique associates an action with a word, and follows how children innately learn their first language at home (Asher, 1969). For example, at home children learn commands with increasing complexity—stand up, get a pencil from the desk, give that cup of coffee to your dad (Asher, 1969). So at school, Lisa taught the word bat, and instructed the students to stand like they were swinging a baseball bat. Lisa felt the physical movement was helpful for all students, not just the kinesthetic learners.

Amy and Jennifer pondered further links between movement and learning. Amy noted that children who had trouble with PA also had trouble with reading. Jennifer argued, *"That's not a coincidence… I don't believe that they are learning disabled. I believe that their physical deficits are impacting the way they learn."* Jennifer felt that lacking a sense of rhythm impacted their ability to ready orally, but furthered it with trouble using patterns in mathematics as well.

So anything… anything involving an inherent sense of rhythm is going to be impacted. In my experience, and this is loosely speaking, so it's certainly nothing I've ever studied, but my strongest math students tend to be my strongest phys-ed students… Or they tend to be very good at something physical…

Hence, PA may be an important factor involving rhythm, and impacts the ability to read and pattern in mathematics. Teachers observing connections between PA and learning may be more sensitive to also finding unique ways to help children make gains in their learning. Teachers who value PA in the classroom, and have philosophies that make PA a priority may have success in engaging, motivating, and helping students learn to the best of their abilities.

Summary

The theoretical model, *Teachers Prioritizing Physical Activity* is composed of two interconnected parts. Part A: *Teachers Target Student Focus*, is illustrated with a bullseye to represent teachers aiming for their students' focus using PA. When teachers observed their students as agitated, fading, or inattentive, they concluded that learning was no longer occurring, and a signal that they could benefit from PA implementation. To view and interpret their students in this way, these teachers may gaze through a particular set of lenses, as illustrated in Part B: *Influencing Factors for Teachers Prioritizing Physical Activity*. There are four factors depicted around the hands holding the binoculars: 1) *Culture of movement*, 2) *Comfort with activity*, 3) *Sense of responsibility for students*, and 4) *Teaching philosophy incorporating activity*. The four factors are linked and overlap with one another, but each may be approached differently to help impact teachers' observations and interpretations that their students could benefit from integrating PA into their classrooms.

In chapter five I will examine the concepts introduced within the model of *Teachers Prioritizing Physical Activity*, and discuss the relevant literature.

Chapter Five: Discussion

> *In order for man to succeed in life, God provided him with two means, education and physical activity. Not separately, one for the soul and the other for the body, but for the two together. With these two means, man can attain perfection* (Plato, fourth century BC).

Plato's quote is at the heart of how the seven teachers related to using PA in combination with their teaching strategies. They shared the mindset that integrating PA during the school day resulted in better learning. They demonstrated that PA should not only be provided in physical education, but throughout the day for maximum benefits such as increased focus and improvements in mood. Teachers provided context as to how they reached these conclusions, and the factors that helped them to prioritize PA. While exploring their understandings during the interviews, I analyzed their interpretations and compared them with the literature. It is my hope that the model, *Teachers Prioritizing Physical Activity,* will provide a new lens for increased understanding of how these teachers view PA and education working together for optimized student learning.

Part A: Teachers Target Student Focus

Children need to learn to focus so that they can become fully absorbed in what they are experiencing (Orlick, 1993). While teachers were aware of the health benefits of PA, it was primarily the educational benefits from PA that they were seeking. As shown in Figure 4.1, teachers targeted student focus using PA when they observed signs that learning was not occurring. "The ultimate goal is for children to learn to focus so well that they can remain positively focused for the duration of the experience… If children learn to do this effectively,

they will gain a distinct advantage in… [all] pursuits and in living life to the fullest" (Orlick, 1993, p. 91).

Orlick (2012) has over 35 years of experience with children, youth, and adults in performance excellence in sport, work, and life. His passion is exploring opportunities for quality learning, performance, and living (Orlick, 2012). He has situated focus as the essential mental skill for any challenging endeavour, and explained that focus essentially directs and affects other important components such as confidence, distraction control, commitment, mental readiness, and ongoing learning (Orlick, 2012). Orlick's contentions may reflect teachers' motivations in their classrooms—honing in on focus, because "positive and fully connected focusing is essential for optimal learning, performance excellence, and optimal living." (p. 174). The challenge that he recognized was that "people of all ages are expected to know how to focus effectively without anyone ever teaching them" (Orlick, 2012, p. 174). Essentially, elementary students do not come to school with knowledge on how to focus themselves, so teachers must endeavour to help them.

The teachers in this study were aware when students were not in a state conducive to learning. Conversely, students may not acquire meaningful awareness of their own states until proper brain development and experience allows (Kuypers, 2011). Students may be acting inappropriately or bothering other students and do not know how to re-direct their attention towards their work (Kuypers, 2011). Some children need help recognizing what they are feeling and what they need in order to perform optimally (Kuypers, 2011). This is sometimes referred to as self-regulation. Shanker (2013) defined optimal self-regulation as, "a state of calm focus and alertness appropriate for learning in a classroom" (p. xiii). He also suggested, "how well students do in school can be determined by how well they are able to self-regulate" (Shanker,

2013, p. xi). Shanker's statements draw attention to the necessity of increasing students' abilities to self-regulate as an important skill required for success at school. Children will be at different levels of development in their ability to self-regulate, and some children are particularly challenged if they have diagnoses such as attention deficit hyperactivity disorder and autism spectrum disorder (Kuypers, 2011).

Jennifer spoke about receiving training in the Zones of Regulation (Kuypers, 2011), which is a curriculum created to help children consciously understand and take control of their actions. Kuypers (2011) created four color-coded Zones, each representing a different set of student behaviors. Students in the Green Zone may be observed as "calm, happy, focused, or content" (Kuypers, 2011, p. 9). The Green Zone represents the necessary state of alertness required for school (Kuypers, 2011). I believe Shanker's (2013) definition of optimized self-regulation is in alignment with Kuypers' Green Zone, both conducive to learning within the school environment. In the Red, Blue, or Yellow Zones, Kuypers described students experiencing intense emotions, being out of control, confused, frustrated, nervous, squirmy, bored, sluggish, or sad. With the help of the teacher, students begin to recognize what they are feeling, triggers, and appropriate responses for reaching their chosen state (Kuypers, 2011).

The model, *Teachers Prioritizing Physical Activity*, depicts teachers observing their students' dynamics and gauging PA strategies to optimize learning for the whole class. My model can be compared to Kuypers' (2011) Zones of Regulation. The inner circle of my model entitled *Student focus*, is similar to Kuyper's Green Zone. Both indicate a desired state where learning can occur. Kuypers compared her Zones to the analogy of traffic lights, where green is considered ""good to go"" (p. 9), and the Red Zone is where a student needs to "stop and regain control" (p. 9). I had also used the comparison of the colored traffic lights, comparing the green

signal to the inner circle, where learning can occur, and the red signal to the outer zone of my model, where learning is not occurring. Kuypers' Red, Blue, and Yellow Zones are comparable to the outer edges of the bullseye in my model, which appears asymmetrical and far away from the inner target zone. When students are in the outer area of the bullseye, or in Kuypers' Red, Blue, and Yellow Zones, they are not in a state congruent with learning. When the teachers observed that their students were in the outer areas of the bullseye, they provided PA. They were hoping to influence their students' movement towards the inner circle– *Student focus*. When the students reached a calm and focused state—noted by behaviors such as: increased attention, participation, engagement, enjoyment, and productivity, then the students were in a state conducive to learning.

In contrast to using PA with the whole class, Lorie spoke of a program called HeartMath, used for a student having trouble transitioning from high energy activities to activities requiring lower levels of energy. She described HeartMath as a computer program that displayed a rainbow icon when the child successfully lowered his heart rate. The essence of the program is that the variability of the heart rate influences the brain in "decision-making, creativity, and emotional experiences" (HeartMath, 2013, p. 4). Students function best when "all of the body's systems [heart, mental, emotional, and physical] are working in harmony" (HeartMath, 2013, p. 5), and in this state, the student is most able to self-regulate (HeartMath, 2013).

I had the opportunity to attend an in-service on HeartMath on March 30, 2015, which was timely during my research, and was influential in developing my model. I was provided a tablet, and clipped a probe onto my earlobe. I was particularly stressed that day, and I was shown the outline of a circle flashing in red. It stayed that way until I was instructed to picture someone that I loved, and the flashing circle quickly shifted from blue to green. I found this a strong

visual cue that I had the power to change how I was feeling, and could see its benefit for students in a classroom who might be struggling to feel calm and to be able to focus on a task. The colors were similar to those in the Zones of Regulation (Kuypers, 2011), but in HeartMath, a rapid shifting from one color to the next could be visualized. Perhaps PA is a similar tool to HeartMath, useful in assisting students to enter into a calmer, more focused state, one that is congruent with learning, but does not require equipment. PA could be a tool that is accessible to students if they learn to recognize its effect on their bodies—by becoming more active at recesses, and having the option to request PA from their teachers. In contrast to a computer program such as HeartMath, PA is an accessible tool to every student, one that requires little if no equipment, has no cost, no upkeep, the battery does not need to be charged, there are no updates, and a student does not need to be singled out, rather a whole class can participate in a PA and receive benefits even if only one student was signalling that PA was necessary.

There are a number of reasons why PA may help students' enter into a calmer state. Ratey (2008) stated that PA makes us feel better through the balancing of neurotransmitters—chemicals in our brain responsible for sending messages. Ahn and Fedewa (2011) presented a meta-analysis of the literature examining the relationship between PA and children's mental health. Their results from 73 studies indicated that on average PA had a beneficial effect on the mental health of all children (Ahn & Fedewa, 2011). If students are in a calmer state, or their neurotransmitters are balanced, students may be in moods that are more conducive to learning than before the PA. Another possibility is Jensen's (1998) linkage of PA to the increased oxygenation of the brain, which would help the brain's efficiency. Finally, PA strengthens not only the muscles of our bodies, but also the important areas of the brain (Jensen, 1998). Ratey

argued that PA primes the brain for learning to occur. His statement could be compared to Part A of my model, whereby PA helps students focus—and primes the student for learning.

The Zones of Regulation (Kuypers, 2011) and HeartMath (2013) are examples of programs available that may help students to self-regulate and achieve maximized learning potentials. PA may be an intervention that some teachers have discovered as helpful for all students within their classrooms. In the following section, I will link Part B of the model, the teachers' lens, to the literature.

Part B: Factors Influencing Teachers to Prioritize Physical Activity

Factor 1: Culture of movement.

Active School culture. Deal and Peterson (1999), authors of the book "Shaping School Culture. The Heart of Leadership," described school culture as an issue of importance in the educational environment. Though school culture is often taken for granted and is undefined, it is extremely powerful and should be seen as *something special* (Deal & Peterson, 1999). They explained that the terms climate and ethos have often been used to try and capture this elusive force, however they believed, that

> the term *culture* provides a more accurate and intuitively appealing way to help school leaders better understand their school's own most accurate unwritten rules and traditions, norms, and expectations that permeate: the way people act, how they dress, what they talk about or avoid talking about, whether they seek out colleagues for help or don't, and how teachers feel about their work and their students (Deal & Peterson, 1999, p. 2-3).

Some readers may challenge my choice of term, *Culture of movement*, because culture brings to mind traditional ways of thinking and doing that have occurred over years. However, I concur with Deal and Peterson's viewpoint that school culture is a strong force that permeates

expectations and shapes teacher's actions and conversations. Culture was also a term used by the teachers.

Fullan (2007), an authority on educational reform, argued that in the absence of a school culture, policy implementation is not enough. Adopting a common mentality or culture within a school brings accountability, daily reinforcement, and transparency amongst peers (Fullan, 2007). An illustration of Fullan's argument is to compare teachers' comments from schools with an *Active School culture*, against schools without the same mentality. Amy, Lorie, and Jennifer related to sharing PA strategies during staff meetings, while Erik, Lucy, Helen, and Lisa stated that their schools did not speak formally about PA. There may be better uptake of a policy such as Alberta Education's (2008) mandated 30 minutes of daily PA, when all teachers within a school adopt a common belief and collaborate, problem solve, and evaluate their practices surrounding that policy.

Elimination of lag time. During the interviews, most teachers reported a lag time between when they began their teaching careers and when they started implementing PA into their routine practice. Pataniczek and Isaacson (1981) asserted that teachers are first concerned with survival, and only later with their effects on students. I found teachers' comments in agreement with Pataniczek and Isaacson. However, I noted that when teachers joined a school that had an *Active school culture*, lag time was eliminated. When there was an *Active school culture*, PA was the norm, and new teachers were expected to adopt the practice. School culture may provide opportunities for observation, participation, and mentorship that promote and enable expedient adoption of routine PA implementation.

Teaching in isolation. Many of the teachers were unaware of their peers' practices, specifically regarding inclusion of daily PA. Dembo and Gibson (1985) referred to working in

isolation from other teachers as "role performance invisibility" (p. 180). They contended that teachers working in isolation is an organizational problem (Dembo & Gibson, 1985), because teachers need exposure to peer practices so they can accurately judge their own performance (Miles, 1965). Ashton and Webb (1986) drew attention to the effects on the teacher of working in isolation—alienation, feelings of uncertainty and self-protection, leading to a sense of powerlessness and job dissatisfaction. Lisa had described a situation that relates to Ashton and Webb's consequences of working in isolation. While Lisa had gained approval from her principal to provide outdoor afternoon PA breaks to her students, she still felt apprehensive towards questioning from her peers. However, questioning from peers could be a form of collaboration and lead to innovative practices, whereas defensiveness and fear may increase teaching in isolation, and limit students from reaping beneficial changes in teachers' practices.

Fullan, Hill, and Crevola (2006) argued that teachers need to engage in every day learning with their peers, otherwise they are not meeting the needs of their students. Waldron and McLeskey (2010) explained further that a collaborative school culture encourages teachers to improve their practices through empowerment for experimentation. While Elmore (2004) acknowledged, that people need to be connected where they present ideas and have them scrutinized. Teachers need to confront their knowledge gaps, but may not know what those gaps are until they are exposed to their peers' practices (Elmore, 2004). Hence, teaching in isolation does not provide daily learning opportunities through the testing or sharing of ideas, which does not stimulate innovative practices and potentially empowerment and job satisfaction. Deal and Peterson (1999) argued that schools should model themselves after businesses that infuse a culture of "*exemplary performance* [italicized in original]… [resulting in] work with meaning, passion, and purpose." (p. 1). Though some may disagree with their comparison of a business to

a school, the point is to promote better performance through increasing knowledge of what colleagues are doing (Deal & Peterson, 1999). The result may be increased innovation and job satisfaction.

Developing communities of practice. Wenger (1998) explained that communities of practice develop informally, just as children who want to play are found congregating at a playground together. Communities of practice are everywhere, and help provide members with a sense of identity, common purpose, support, and belonging (Wenger, 1998). Teachers sought out peers with similar interests, and outlets to inform their practices, such as Twitter sites and professional development courses.

While some teachers related to seeking support from social media groups or courses for information, Lucy, Lorie, and Lisa noted the positive influence of peer observation. Jablon, Dombro, and Dichtelmiller (2007) asserted that teachers should approach observation as a valuable component within their timetables, as "an opportunity to wonder and learn" (p. 7). Bandura (1997) explained that *vicarious experiences*, such as peers informally modeling behaviors, were influences on confidence and self-efficacy. Viewing peers' competencies serves as an internal comparison of ones' own capabilities (Bandura, 1997). Observing peers enlightens practices through transformations of perspective, inspiration, sparking new interests, and improving collegial development (Bell, 2001). Martin and Double (2006) furthered the benefits of peer observation from collegiality to changing the work culture, and can influence many people simultaneously (Bandura, 1978). It may be that increasing peer observation could serve as a springboard to developing an *Active School Culture*—previously noted as influential in engaging teachers to prioritizing classroom PA.

Building culture. Waldron and McLeskey (2010) argued that the principal should not be the sole source of leadership. Principals should engage the expertise of teachers within the school, distribute leadership amongst staff, provide support for decision making, and promote coherence to prevent fragmented efforts (Waldron & McLeskey, 2010). *Developing communities of practice* could be the first steps towards building an *Active school culture*, where teachers begin seeking support, exerting leadership, and gaining innovation in their practice. Communicating with other teachers fosters a sharing and the organization of guidelines necessary for other teachers to implement similar practices (Bandura, 1997). Increasing collaboration amongst staff members may also help to build a more cohesive or cultural agreement towards PA within the school, and potentially increase the comfort level of teachers implementing new practices of PA.

I believe that developing a *Culture of movement* is an important factor for teachers to adopt PA strategies in their classrooms. When a whole school adopts a focus towards a goal, expectations of staff are clearer, and teachers may share information to assist in their peers' learning. An awareness of peers' practices may increase support, and teachers may be more likely to experiment with novel practices such as PA in the classroom. In the absence of an *Active school culture*, teachers could try to *Develop communities of practice*, serving to encourage and facilitate innovative PA practices. Limiting *teaching in isolation* can improve teachers' performance and job satisfaction, and also eliminate the *lag time* when teachers begin integrating PA into their practices. Working together as a school towards implementing policies such as the daily PA policy, may prove effective in garnering teachers' enthusiasm and buy-in for increased implementation.

Factor 2: Comfort with activity.

In this study, teachers who used PA regularly in their classrooms chose active lifestyles in their personal lives. It stands to reason that the more teachers use a skill, the more comfortable they may feel using that skill. I found that not only had all the teachers at some point been personally physically active, but most of them drew from past experiences where they had used PA with children in different types of jobs. Having an interest in PA may lead teachers to seek further opportunities to incorporate PA into other areas of their lives. Leading an active lifestyle may translate to attributing value to PA for health, feeling good, and potentially for teaching and learning.

Active lifestyle. Kulinna, Silverman, and Keating (2000) suggested that teachers only incorporate highly valued beliefs when they are influential on their teaching goals. This could explain why some teachers experience a lag time between when they begin teaching and when they begin incorporating PA into their teaching regimes. Teachers may need time to formulate their teaching goals and then make connections between how PA contributes to meeting those goals. Many teachers may be physically active in their personal lives, but do not transfer this experience into their classrooms unless they can attribute value to PA meeting their teaching goals.

Teachers found PA as conducive to meeting a number of teaching goals. Lucy associated PA as bolstering enjoyment and engagement in her classroom. Lorie used PA as a relational tool. Helen, Amy, and Lorie valued PA as a transitional tool to change the energy in the room. Brown (2010) stated that the addition of PA creates a sense of playfulness and becomes a contagious act. When teachers insert PA in the classroom as a game or a quick transition between learning activities, it is easy to anticipate how the energy in the classroom could change

to light-hearted fun. As Lucy suggested, PA is often enjoyed and creates engagement. Meyer and Turner (2006) suggested that teachers who consistently "provided positive emotional experiences" (p. 377) contributed to classroom engagement and motivation to learn. Hence, inserting PA into the classroom to promote students' enjoyment, may increase their motivation towards learning.

Teachers who engaged in personal PA related to *feeling better* following PA. Following closely with Lucy's teaching goal of using PA to increase students' enjoyment, is incorporating PA to help students feel better. Research shows that runners commonly describe a peacefulness or euphoria during or following a run (Kolata, 2008). PA causes a balancing of neurotransmitters—the chemicals in the brain, and can affect mood in the same way that drugs are used for anxiety and depression (Ratey, 2008). In the classroom, teachers related that PA helped their students feel calm and ready to learn. Helen explained that PA provided students a *release*. Amy related to Helen's statement, and explained that her ideal was to have a stationary bike where her students could burn off their adrenaline when they were angry. Teachers who are physically active may have an intuitive sense when their students require PA to feel better. They may also have a comfort in using activity to relate to their students, and value the effects as congruent with their teaching goals.

Background experience. The context of most teachers' experiences included past jobs where they had used PA with children. Guskey's (2002) Model of Teacher Change suggested that teachers change their beliefs and attitudes towards practices once they see success with their students. He argued that while professional development is important, it is teachers who must judge the effectiveness of their strategies successful for them to be sustained (Guskey, 2002).

Hence, teachers who viewed their past experiences using PA with children as positive, may see the usefulness of those activities in a different environment – that of the classroom.

Bandura stated (1997), that confidence comes with evidence of success, and as such, comfort with PA may come as a result of teachers judging their strategies as successful. He also explained that experiences of mastery provide powerful evidence of successes, and "build a robust belief in one's personal efficacy" (Bandura, 1997, p. 80). Hence, when teachers pull from their past successes, they may also be drawing on their inner comfort and skills which had previously instilled confidence.

Factor 3: Sense of responsibility for students.

Teachers conveyed feeling a sense of responsibility and accountability to their students. When they spoke of implementing PA, it was not spoken of as a chore, or due to the policy mandating 30 minutes of daily PA. The teachers spoke genuinely of trying to impact their students' ability to learn by implementing PA. Bandura (1997) defined self-efficacy as the belief in one's ability to produce a desired result. Bandura argued in his Theory of Self-Efficacy, that when one has a strong belief in one's own ability, that person is generally more effective and successful than those with a lower sense of self-efficacy. In this analysis of the literature, I will not provide a detailed analysis of Bandura's theory. I will however, highlight the components of his Theory of Self-Efficacy as they relate to my findings, as well as referring to the work of other authors who provide further context to self-efficacy as it relates to teachers.

Ashton (1984) specifically defined teachers' sense of efficacy as, "the extent to which teachers believe that they have the capacity to affect student performance" (p. 28). I believe that Ashton's (1984) definition of self-efficacy fits what I was hearing from these teachers—that they believed they could positively affect their students' learning. These teachers demonstrated high

levels of self-efficacy by trying to impact their students' ability to learn, their willingness to nurture students' self-regulation, and by adopting non-traditional teaching styles.

Personal responsibility for student learning. The following two statements from Dembo and Gibson (1985) illustrate the difference between teachers with high or low sense of self-efficacy. "I need to spend more time helping Mary improve her reading comprehension; [and] these kids just don't care about learning" (Dembo & Gibson, 1985, p.173). The teachers I interviewed provided examples resembling the first statement. They spoke of how they were meeting the challenges within their classrooms so that all students could learn and succeed in their studies. I found three characteristics shared by the teachers, they were: problem solving, self-reflecting, and self-educating.

Problem solving. Bandura (1997) described problem solving as demonstrating perseverance and the desire to seek success by overcoming obstacles. He explained that success gained easily does not have the same impact on one's sense of self-efficacy as does the experience of overcoming obstacles (Bandura, 1997). Teachers who consistently problem solve for their classrooms are demonstrating characteristics of high self-efficacy. They are demonstrating their viewpoint that challenges in their classes are problems to overcome, not indications that the students cannot learn (Dembo & Gibson, 1985). Teachers with a high sense of self-efficacy believe that there are other options, and they take on the responsibility of finding strategies that will make a difference for their students; I found these characteristics of high self-efficacy in teachers in this study.

Self-reflecting. When teachers spoke of solving problems in their classrooms, self-reflection was closely linked to integrating new strategies to practice. Ashton (1984) stated that teachers who problem solve and reflect on their practice are most commonly associated as

having high levels of self-efficacy. She explained that if teachers with a high sense of self-efficacy have students who are experiencing difficulties, they examine their own practices and seek new ways to reach those children (Ashton, 1984). Teachers with lower efficacy look for "explanations in terms of the students' ability, family background, motivation, or attitude" (Ashton, 1984, p. 29). During the interviews, teachers recounted daily reflections about not providing enough PA (Lorie), or reflecting on a trial run of afternoon recesses (Lisa), but did not use student diagnoses or family socioeconomic status as factors in students' performance. Bandura (1997) postured that information is not inherently enlightening, it becomes useful only through reflective processing. Kim (1999) argued self-reflection as a mode of developing knowledge, while Asselin (2011) stated that self-reflection is important "for gaining insights into self and practice" (p.2). The teachers seemed aware of their reflective practices as a necessary component of their teaching. A self-reflective nature may permeate the teachers' awareness of their educational needs.

Self-educating. All seven teachers provided examples of their self-educating practices. Fullan (2007) argued that teachers need professional development, but strategies for change need to go deeper. Perhaps teachers who self-educate demonstrate further desire to create change and affect their students than teachers who only attend mandatory professional development. They may be internally motivated to improve their practices to better affect their students. Ashton (1984) described eight dimensions distinguishing teachers with high self-efficacy, two of these included: a sense of personal accomplishment, and strategies for achieving objectives. These dimensions indicate that teachers with a higher sense of self-efficacy may attach an importance to their work, and may set goals for themselves that require self-education (Ashton, 1984). Being self-educating may not only indicate a high sense of self-efficacy, but also a willingness to

learn more about what their students' need. Teachers from this study identified that their students responded well to the addition of PA, and were drawn to educational sessions, Twitter groups, like-minded people, the internet, and resource groups to add to their knowledge base.

Nurturing self-regulation. Teachers voiced an awareness that children cannot learn if they are struggling to pay attention (McDermott, 1977). They provided numerous examples of strategizing for some of their students' complex needs, with the goal of helping them to self-regulate. McDermott (1977) pointed out that the environment is only conducive to learning if students' are self-regulating. Teachers spoke of working on their relationships with their students, because trust was necessary to help with self-regulation, and vital for effective teaching and learning (McDermott, 1977). When teachers work at understanding what unique needs their students have in order to learn, they build a trusting relationship with their students and work towards common goals that make sense to each of them (Ashton, 1984). To nurture self-regulation teachers may develop unique classroom strategies that stray from traditional forms of teaching.

Non-traditional teaching style. When providing examples of their teaching methods, teachers classified themselves as using *Non-traditional teaching styles*. They spoke of tolerating movement and noise, and had a willingness to adjust teaching schedules and strategies towards what their students required. They compared themselves to other teachers, and felt that their methods were different, and less traditional. I was privileged to interview the teachers in their classrooms, and noted non-traditional equipment such as stand-up work stations and desks in groupings rather than in traditional rows.

A *traditional* teaching style has been linked to one of control and conformity (Woolfolk, Rosoff, and Hoy, 1990), and is associated with teachers having lower levels of efficacy (Barfield

& Burlingame, 1974). In contrast, a humanistic teaching style is one where the teacher is willing to give up some aspects of control, and generate a climate conducive to meeting individual students' needs (Woolfolk et al., 1990). Ashton (1984) has supported the notion that teachers with a high sense of efficacy involve students in setting goals for their learning, developing their autonomy, and nurturing their self-regulation.

Ryan, Connell, and Deci (1985) advocated for the role that teachers play in helping students' intrinsic motivation in school. Teachers who were less controlling in their approaches, supported student autonomy for discovering their own interests (Ryan et al., 1985). Students afforded choice showed enhanced intrinsic motivation in school (Ryan et al., 1985). Ryan et al. furthered their explanation that teachers can provide structure, and yet balance limitations in ways that are not too controlling. I would suggest that the teachers in this study provided examples illustrating trust, affording choices, providing mutually effective boundaries, promoting self-regulation, and generating interest through engagement with learning. The definition of the humanistic teaching style seems a fit for the *Non-traditional teaching styles* described by these teachers.

Teachers with high self-efficacy may feel confident in their abilities to balance student autonomy while setting limitations on disruptive behaviors. Such is the case when teachers allow students to move around the classroom or to choose their work-stations. These teachers may have confidence in the benefits of PA, which may lead to a tolerance of the subsequent noise. Teachers may need to be supported in developing higher levels of efficacy, so that they can develop their practices towards increasing student learning through problem solving, self-reflection, self-education, nurturing students' self-regulation, and using non-traditional teaching styles. The teachers interviewed for this study, exemplified high levels of self-efficacy and had

confidence in their abilities to reach their students through their personalized teaching styles, which strayed from traditional methods.

Factor 4: Teaching philosophy incorporating activity.

The final factor influencing teachers to use PA in their classrooms were their personal teaching philosophies. Schonwetter, Sokal, Friesen, and Taylor (2002) defined a teaching philosophy as "a systematic and critical rationale that focuses on the important components defining effective teaching and learning" (p. 84). The teachers had thoughts and ideas that blended PA with their strategies impacting their students' ability to learn. First, they portrayed evidence that PA was a vital component to *everyone's* day, not just their students. Second, that children need activity to learn optimally. I will explain the two elements: 1) *Physical activity is vital to the day*, and 2) *Children learn best with physical activity*, using the literature.

Physical activity is vital to the day. "Sitting is the new smoking" (Verschuren, Mead, & Visser-Meily, 2015, p. 10) is the current phrase making media headlines. No longer are we considered healthy if we run for 30 minutes in the morning and then spend the rest of our day sedentary (van der Ploeg, Chey, Korda, Banks, & Bauman, 2012; Verschuren, Mead, & Visser-Meily, 2015). van der Ploeg et al. (2012) demonstrated that sedentary behaviour is not offset by PA, rather people need to increase their time engaging in PA *and* limit their sitting time. All teachers interviewed seemed aware of this concept conveying their belief that a sedentary school day was not only unhealthy, but also incompatible with learning. They believed that PA was vital to everyone's day, but especially the school days of their students.

According to Amy, although there is a general consensus in a mind-body connection, in practice the two are treated separately. Burkitt (1998) also argued against Cartesianism—the belief that mind and matter should be treated as two different realms. Burkitt suggested that the

Western world has "become accustomed to thinking of the body as a purely physical entity, which is separate from the mind" (p. 63). While it may seem easier to focus on the mind over the body when education is concerned, it may not be the most effective. Burkitt insisted that humans are *doers*, and work best when there is complexity to our tasks, which is often the case when *both* the body and the mind are activated.

Wright (2000) agrees with Burkitt (1998), that the Western world's school system creates a distinction of the body from the brain by separating PA from the other curricular courses (such as physical education). If we were to follow Descartes' suggestion to merely subdue and control the body, then we are losing the connection between *understanding* our bodies for a better sense of self (Wright, 2000). In other words, subduing the body during the school day is to learn to sit still. Whereas becoming self-aware, is to understand and provide the body with PA when necessary, for the brain to operate optimally. This would seem in alignment with teachers who incorporate PA, *nurturing* students' desire to move, rather than requiring them to suppress the desire. Subsequently, students can learn that PA not only helps them to feel better, but also to learn more effectively. Cothran et al. (2010) articulated that if the goal is to influence teachers to incorporate PA daily, then we must educate on "brain-body learning links and how to use that knowledge to build better classroom physical activities" (p. 1387). Educating regarding the body-brain learning link could facilitate the necessary attention and increased comprehension towards how the two can work together for interrelated benefits in the classroom.

Children learn best with physical activity. Teachers conveyed a strong belief that children require PA to optimize learning. In chapter one, I introduced the positive effect of PA on executive functioning, especially when the PA included complex motor movements or activities that required more cognitively complex tasks, such as when playing games (Best,

2010). PA has also been shown to increase the release of BDNF in both animal and human studies with improvements to cognitive functioning (Ferris et al., 2007; Vaynman et al., 2004). In chapter two (literature review), I identified eight intervention studies that showed a positive relationship between PA and academic testing in children (Bartholemew & Jowers, 2011; Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Hill et al., 2010; Hill et al., 2011; Kibbe et al., 2011; Mahar et al., 2006; Reed et al., 2010). The authors documented increased academic test results (Donnelly & Lambourne, 2011; Erwin, Fedewa, & Ahn, 2012; Hill et al., 2010; Hill, Williams, Aucott, Thomson, & Mon-Williams, 2011; Kibbe et al., 2011; Maeda & Randall, 2003; & Reed et al., 2010), improved attention levels, memory, (Ratey, 2008), and on task behaviors (Bartholemew & Jowers, 2011; Kibbe et al., 2011; Mahar et al., 2006). If teachers observe academic gains linked to PA without using controls, academic measures, or equipment such as pedometers, accelerometers, or brain scans, it represents evidence that other teachers and schools should consider adopting similar practices.

There are many reasons that PA may optimize students' learning. According to Jensen (1998), PA enriches the environment possibly by challenging, stimulating (Jensen, 2006), and enlisting more of the senses (Wolfe, 2001). Engaging in PA may offer an avenue for behavioural exploration—an indicator of curiosity and a motivator in "learning and task persistence" (Raine, Reynolds, Venables, & Mednick, 2002, p. 671). Lucy endorsed PA for enjoyment. Jensen (2008) linked emotions to affecting learning, stating that, "emotions give us a more activated and chemically stimulated brain, which helps us to recall things better" (p. 90). Arends (1991) contended that, "experienced teachers know the importance of motivation…[as guiding] students' actions" (p. 108). Hence, inserting PA into the classroom may enrich the environment, promote stimulation, curiosity, enjoyment, and increase motivation towards learning.

Brown (2010) advocated the benefits of play for learning in children, and recommended PA to kick-start play. Brown asserted that when we play, we let go of our inhibitions and feel happy. Play can be the foundation of feelings of anticipation, pleasure, empowerment, and mastery (Brown, 2010). Children's play brings novelty, fun, and innovation, and is necessary for the developing brain (Brown, 2010). Novelty is an "innate attention-getter" (Wolfe, 2001, p. 82), and PA can provide new activities or new ways of looking at things. Combining play with curriculum brings great possibilities to the school day, or at the very least, breaks up the day with anticipation and pleasure.

In addition to enriching the environment and engaging students, Lucy, Helen, and Lisa spoke of strategizing for students' different learning styles, most widely referred to as visual, auditory, and kinesthetic (McCabe, 1985). Some students learn best when listening to directions, others prefer visualizing material (Brace, Gordon, & Schumaker, n.d.). Kinesthetic learners require physicality, and understand best when they can interact with the subject matter (Werner & Burton, 1979). Dunn, Griggs, Olson, Beasley, and Gorman (1995) stated that children achieve significantly higher test scores when teachers use strategies consistent with students' preferred learning-styles. However, Lisa felt that while some students had preferred learning styles, all students learned a second language best if physicality was employed. In support of Lisa's assertions is Asher's (1969) researched approach to teaching second languages that associate physical actions to sounds, found similar in first language acquisition. Hence, while teachers need to implement strategies to meet the needs of all students' learning styles, PA may be useful for all students if used in certain curriculum areas.

Ratey (2008) referenced a senior high school in Chicago, that experimented with PA and learning. Students wishing to increase their reading comprehension scores joined "Zero Hour PE

[physical education]" (p. 10), where they ran before school started with the purpose of increasing their heart rates (Ratey, 2008). One student commented that participating before classes helped to improve her mood and wake her up (Ratey, 2008). The participants "show a 17% improvement in reading and comprehension, compared with a 10.7% improvement among the other literacy students who opted to sleep in and take standard physed" (Ratey, 2008, p. 11). The school experimented with pairing fitness with academics and recommended that, "all students schedule their hardest subjects immediately after physical education, to capitalize on the beneficial effects of exercise" (Ratey, 2008, p. 12). The physical education teacher also changed the focus of physical education from skill development to targeting heart rates. Although this school is senior high, children of all ages may learn best when the body is challenged along with the brain.

Reflections, Implications and Recommendations

Reflection.

As this study nears completion, I want to reflect on my research experience. I began this process with a desire to help increase students' opportunities for PA. Through my personal experiences of discovering confidence in sport and a sense of calm and exhilaration through all activity, I have experienced that PA profoundly affects our bodies and our brains. As a Public Health Nurse having worked with children, teachers, and parents, I feel privileged for the opportunity to have taken a health concern through the research process. Nurses and teachers working together to influence the health and learning potential of school age children is an important partnership, and provides an opportunity that exists five days a week in the school environment. I found working with teachers extremely rewarding, and an opportunity that holds the potential for an abundance of research that could directly affect students.

Limitations, Strengths, and Future Research

Limitations.

I will discuss the limitations from two aspects, those involving the research methods, and those involving the researcher. First, interviewing only seven teachers may be a limitation. There was little ethnic diversity amongst the teachers, however they did speak of awareness of how their students' families with different cultural identities viewed PA and academics. Second, research for this study occurred from January through May 2015, to abide by the stipulations set by the CBE and complete my research within the school year. In being true to the constructivist grounded theory methods, I could have used more time between interviews for reflection and memoing, but I do not feel that it affected the theory that emerged. Working within the confines of the given timeline, it was difficult scheduling interviews, working around teachers' schedules, holidays, and hours, transcribing, and allowing enough time for constant comparison and reflection between interviews. This was my first research study, and as such, I am not practiced in constructivist grounded theory interviewing. Hence, I was learning through the process, in collaboration with my supervisor.

Strengths.

I feel my study has a number of strengths. Of the seven teachers interviewed, one was a male. There is a larger ratio of female to male teachers in grades 1-6, so I felt this was appropriate. Additionally, the study included teachers from ages 23-50. Teachers came from schools representing all grades, and all quadrants of the city.

Another strength was that teachers appreciated the insights they gained from participating in the study. Jennifer commented, "When I emailed you back and said that I don't incorporate regular, structured PA breaks; I now realize how often I actually do incorporate them, and how

important they are for the students." To hear the impact of an interview on a teacher was rewarding.

Future research.

While there are many directions that future research could take, I feel it would beneficial to target school culture to influence all teachers to use PA. I think that engaging a school in a pilot participatory action research study to build a culture of movement would be a worthwhile project. While I don't believe that a *cookie cutter* approach is the answer, there are strategies that are working in schools from which others could learn.

Other directions for future research may involve exploring teachers capitalizing on PA outdoors. Some students may receive greater benefits from PA occurring outdoors because of the space, ability for increased noise, and other perceived benefits, such as interacting with nature. I would also suggest researching teachers participating with their students. Additionally, researching teachers' perceptions after participating in intervention research contrasting students receiving moderate to vigorous PA compared to five minutes of less heart rate inducing activities.

Implications

Implications for teachers. An important aspect of my study is that all the teachers were implementing classroom PA of their own volition. They were not part of a program or an intervention requiring the teacher to provide the PA. These teachers, through various factors identified in my theoretical model, *Teachers Prioritizing Physical Activity,* attributed PA as a useful teaching strategy.

In chapter one, I outlined Alberta Education's use of the internationally recognized Comprehensive School Health framework, "supporting improvements in students' educational

outcomes while addressing school health in a planned, integrated, and holistic way" (Pan-Canadian Joint Consortium for School Health, n.d., p. 1). Obesity and physical inactivity are growing concerns in children (ParticipACTION, 2015; Roberts et al., 2012; Shields, 2006; WHO, 2010), and the school represents the ideal environment to include increased opportunities for PA because of the benefits to students' developing brains (Khan & Hillman, 2014; Report, 2013; Sibley & Etnier, 2003). Using the Comprehensive School Health framework, health should be incorporated throughout all aspects of the school day (Pan-Canadian Joint Consortium for School Health, n.d.). Hence, PA should not only be provided in physical education classes, but be implemented at times when students are no longer focusing on their work, or at planned intervals to prime their brains for learning to occur (Ratey, 2008). This would also follow the mandated policy, stipulating teachers should provide at least 30 minutes of daily PA (Alberta Education, 2008).

PA has been shown to increase the release of BDNF, a protein responsible for increasing cognitive functioning (Ferris et al., 2007) through its effect on neuron survival (Binder & Scharfman, 2004; Hillman et al., 2008), and neuroplasticity (Binder & Scharfman, 2004; Vaynman et al., 2004). In addition, PA positively effects executive functioning, especially when combined with complex motor movements or games requiring thinking (Best, 2010). Hence, teachers should adopt evidence-based practice, integrating research based strategies that will affect their ability to teach and their students' ability to learn. Teachers could take the example of using PAAC (Gibson et al., 2008; Donnelly & Lambourne, 2011), and implement PA with pertinent curriculum, or they could use PA as a purposeful transition to prime the brain for the next session of learning (Ratey, 2008).

Schools and health resource groups need to be creative in their approaches to instigating healthy environments for students. My theoretical model can help to widen the perspective in helping teachers include PA. My model may provide different entry points to influence teachers, such as helping promote a *Comfort with activity* by targeting teachers' activity levels; and for teachers who are already active, helping them identify how PA can be valuable in the classroom setting. Another entry point to increasing the use of PA in the classroom is to help build teacher efficacy by promoting self-reflection, peer mentorship, and opportunities for observation to enhance innovation and decreasing teaching in isolation. Third, promoting an *Active school culture* could enhance the support that teachers feel amongst their peers in following a common course. Finally, my research offers examples and quotations from the teachers about the academic benefits of classroom PA for students, which may resonate with other teachers and help them to self-identify what assistance they may require.

Implications for nurses. In my experience, people value the role of nurses in their schools and communities. Nurses in all fields of practice, are advocates for the health promotion of the public. Nurses need to find creative ways to impact the health of children, and find ways that meet the needs of all parties involved. Nurses work directly with students, teachers, and parents, and can lend support by emphasizing the importance of PA during the school day (Naylor & McKay, 2009). Through conversations with direct contacts, nurses must join stakeholder health plans and advocate for children. Nurses can initiate participatory action research projects with schools to highlight strategies that are working and build group capacity (Whitehead, 2006). Whitehead (2006) argued that, "school nurses [should] seriously consider action research as an appropriate collaborative, participative, and change orientated method for programme implementation and evaluation" (p. 268). Although nurses may not be directly

linked with PA in schools, they are indirectly important to supporting, communicating, and advocating for the health of all, and should work towards increasing their visibility and impact.

Summary

In my study, "Health Promotion Through Physical Activity in the Classroom: Exploring Teacher's Perceptions," I used the constructivist approach to grounded theory and interviewed seven teachers known to use PA in their classrooms. I was interested in exploring the teachers' multiple viewpoints, their processes, and decisions surrounding their experiences instigating and sustaining the PA in their classrooms. Through constant comparisons at all levels of analysis, consulting with the literature, and creating memos, the theoretical model: *Teachers Prioritizing Physical Activity in the Classroom* emerged from the data.

The model features a pair of hands holding binoculars with the words "brain" and "body" written boldly across the lenses. There is a body and brain connection that cannot be ignored by the teacher looking through the binoculars. In using the binoculars to view their students, the teachers observe and interpret their students with the body and brain connection at the forefront of their vision. The teachers see a bullseye, with *Student Focus* as the target. When students are in the target zone, they are attentive, calm, and optimized learning is occurring. When students are not in this zone, they may be in the outer areas of the bullseye, indicating that the students' bodies are requiring PA. PA is a strategy implemented by teachers that helps students to get back into the targeted zone, one that is conducive to learning.

The words written across the teachers' hands represent influencing factors that promote teachers to use the binoculars—or to use and interpret their students as requiring PA to promote optimized learning. There are four factors, briefly described. Factor 1: *Culture of movement*, which may be the most influential to teachers of all the factors. Teachers were found to either

have an *Active school culture* where the school as a whole directed activities for teachers and students to be more physically active, or *Developing communities of practice,* where teachers created informal partnerships, joined social media, or observed their peers for support and ideas about using PA within their classrooms. Factor 2: *Comfort with activity,* captures two concepts: *Active lifestyle* and *Background experience*. Teachers routinely incorporating classroom PA, spoke of active backgrounds and felt comfortable leading and participating in activities with their students. Many teachers also spoke of feeling comfortable because of previous experience using PA with children. They had an internal bank of ideas that were readily recalled and used during curricular transitions. Factor 3: *Sense of responsibility for students*. Though I was not measuring self-efficacy, it was a concept that emerged from the data, that teachers using PA in their classrooms had characteristics consistent with high levels of self-efficacy. Teachers showed three elements: *Personal responsibility for student learning, Nurturing self-regulation,* and *Non-traditional teaching style*. These teachers may be highly attuned to the needs of their students, and foster an environment that is more tolerant to understanding and nurturing those needs and assisting with self-regulation. They also find *Non-traditional teaching s*tyles more suited to their practices allowing more movement within their classrooms. Factor 4: *Teaching philosophy incorporating activity* addressed the mentality that the addition of PA not only vitalizes the body and brain, but is necessary for children to learn.

Concluding Remarks

The *Theoretical Model of Teachers Prioritizing Physical Activity* is the result of theorizing the processes of instigating and sustaining factors of teachers using PA in their classrooms. Teachers prioritizing PA may view their students through a lens that captures the essence of a body-brain connection, whereby their teaching philosophies, idealized school

environments, comfort levels, and confidence levels embrace PA and education together. Through a lens that is supported by their peers and administration, through modeling, active discussions, lifestyle habits, and past experiences, teachers view their students' learning as optimized through awareness and activation of the body. To benefit our children who do not receive enough PA during the day, every effort should be made to help students build awareness in recognizing how PA makes them feel. Teachers should use PA as a strategy to help focus their students during the school day. Children can receive the health benefits from receiving PA daily, and the academic benefits from activating their bodies and their brains.

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APPENDIX A: TEACHERS' PERCEPTIONS

Reference	Aims	Participants	Location	Methods	Results	Strengths/ Limitations	Key Findings	Conclusions
(Cothran et al., 2010)	Assessing teachers' perceptions of a one year long curricular change initiative integrating PA into the classroom 1. What presses operate to encourage a teacher to voluntarily engage in a program involving PA? 2. What presses act as inhibitors to those efforts?	23 – grades 1-12 teachers (14 female, 9 male) From 10 different schools	Schools in Native American communities in the Southwest U.S.A.	Qualitative 2 interviews at the beginning and end of the year long project Data analysis via constant comparison	Teachers' willingness to engage in the project was due to: Stakeholder level – desire to meet needs of whole student Personal – PA was a match for the teachers' pre-existing personal wellness interest Negative presses: Scheduling and academic pressures Also – perception whether program was increased work or in support of work	Strengths: Qualitative Interviewing of Teachers Limitation: Structured interview guide with choices of specific answers Grades 7-12 teachers included, but spend less time with their students in a day Schools had small populations of 14-107 students total, therefore decreased applicability	The decision to engage in a school change is ultimately a personal decision based on individual experiences such as caring about the students' lives outside of school Self efficacy may be a factor as teachers' willingness to use PA was based on prior positive experiences Scheduling and standardized testing are negative presses	Efforts to inspire change in teachers may need to be individually tailored and focus on self-efficacy and wellness, with support measures for scheduling and standardized testing pressures.

						Study is based on a minority group		
(Gately et al., 2013	Add the teachers' viewpoint to the TAKE 10! Research	8 grades 3-6 teachers 2 schools 4 male 4 female	Yorkshire region in UK	Qualitative Semi-structured interviews 3 times in one year	2 themes identified: 1. Barriers to TAKE 10! implementation 2. Benefits of implementing TAKE 10!	Strengths: Focus on grades 3-6 teachers Limitations: Interviews only took 10-15 minutes	1. Barriers to implementation: curriculum constraints, school trips / other events, novel approach needs to become routine, small classrooms 2. Benefits of implementation: enjoyment & engagement of students, improved focus, concentration, attention, alertness, stimulation	Teachers felt TAKE 10! was worthy in theory, but not practice. Teachers did not fully engage in the training. Hence, further strategies may need to be devised to value PA as much as education
(Gibson et al., 2008)	To monitor the delivery of services and evaluate the implementation of a PA program that is linked to the	24 schools (14 intervention and 10 control) Grades 2-5 students and teachers 4905 children	Midwest region of U.S.A.	Mixed Methods Cluster-Randomized Controlled Study Observation	Teacher training attendance exceptional. Teachers incorporated active lessons on most days, resulting in greater student PA levels than in controls.	Strengths: Mixed Methods approach captured teacher perceptions	Integrating PA with curriculum can be viewed positively by both teachers and students. Teacher flexibility with program	Students and teachers can view increased PA during the school day positively, and not feel that PA is depleting curriculum time.

	curriculum in 10 minute sessions Tracking of teacher training issues, challenges and barriers to effective implementation of PAAC lessons, initial and continual use of program specified activities, potential competing factors to the program	79 teachers out of 149 participated in focus groups		Online Questionnaire Focus Groups	Students enjoyed lessons more than controls. Minimal competing factors.		implementation is key. Teacher training is important.	
(Maeda & Murata, 2004)	Demonstrate PE teachers sharing strategies with classroom teachers on infusing PA in short bouts	24 teachers from 3 schools from Preschool to grade 2 Class sizes ranged from 8-24 students	Hawaii, U.S.A.	Descriptive article Anecdotal teacher comments, no methods reported	All teachers reported using the sessions more than once a week	Limitation: Inclusion of Preschool & elementary students No method reported for teacher	With some training and the goal of 5 minute sessions, teachers may be willing to add PA into their students' days	Classroom teachers can be valuable in promoting PA, and can be willing to include short sessions of PA into their day

	throughout the day Demonstrate the effects of the above – Getting Energized & Recharged (GEAR)					interviews or measurements taken		
McMullen et al., 2014	Explore teachers' perceptions of integrating PA into their classroom setting & determine key activity features	12 teachers: 3 grades 4-6 1 K-6 counsellor 8 grades 7-12	1 Indiginous school district U.S.A. 4 elementary schools 8 high schools	Qualitative Semi-structured interviews Reflective Journaling 1-2 interviews per participant Interviews between Nov.-April & lasted 40-60 mins	3 teachers themes of classroom PA identified: 1. PA threatens classroom control 2. PA is preferred if it links to academic content 3. PA is preferred if it is seen as easy to implement and fun for the students	Strengths: Focus on teachers' perceptions Limitations: 8 high schools Interview results not separated by grade	Even though willing to try, teachers believe allowing PA threatens classroom control Some teachers found success in using PA as a reward	Teachers view academic content as their priority, hence PA that links curriculum may be the most successful strategy to obtain teacher buy-in
(Kibbe et al., 2011)	See Appendix C							

APPENDIX B: PHYSICAL ACTIVITY BREAKS

Reference	Aims	Participants	Location	Methods	Results	Strengths/ Limitations	Key Findings	Conclusions
(Ahamed et al., 2007)	1. Evaluate a PA program (AS! BC) effect & academic performance 2. Determine effect based on gender	287 children, grades 4-5 143 boys, 144 girls 10 schools	Canada	16 month cluster RCT 10 schools randomized to INT or control 15 min PA breaks, 5 times/week for 16 months Measures: BMI PA questionnaire for children Canadian Achievement Test (CAT-3)	Students in INT schools received 47 more minutes/week of PA $p < 0.001$ No significant different in CAT-3 scores between INT & control groups & between genders	Strengths: Use of a control group 16 month intervention PA was provided by teachers Limitation: Self reporting of PA	Despite using approx. 10 minutes/day for PA, academic performance was not compromised	The AS! BC program used can increase student PA while maintaining academic performance
(Hill et al., 2010)	To determine if increased PA during school effected cognitive performance	1224 children in grades 4-7 6 schools	Scotland	Randomized crossover design trial 30 minutes after lunch, students received 15 min PA/day for 1 week, and no	PA caused positive cognitive performance $p < 0.001$	Strengths: Consistent timing of PA provision & academic testing Limitation:	Student performance on cognitive tests requiring attention were most improved PA benefits confined to	PA even if only increased over a week can effect academic test results

	PA in the one week Measure: 5 psychometric tests at the end of the day (paced serial addition, size ordering, listening span, digit-span backwards, digit-symbol encoding)	Some difficulties understanding academic testing instructions	second week of the study

(Hill et al., 2011)	Examining the reproducibility of the previous results (Hill et al., 2010) of improved cognitive performance following classroom PA	552 children in grades 4-7	Scotland	Randomized crossover design trial 2 week duration 1 group received 15 min PA/day, 30 minutes after lunch for one week, and none the next 1 group received no PA and then PA in the next week Measure: one part per day cognitive test battery	PA caused positive cognitive performance, not moderated by gender, ADHD, or BMI $p < 0.001$	Strengths: Replicated study	The results of this study indicate that the initial Hill et al., 2010 study were robust & could be replicated, even in a school with a more diverse socio-economic population Benefits of PA are similar for all children, despite BMI measurements PA benefits confined to second week of the study	PA interventions positively effect cognitive performance

APPENDIX C: PHYSICAL ACTIVITY INTEGRATION

Reference	Aims	Participants	Location	Methods	Results	Strengths/ Limitations	Key Findings	Conclusions
(Bartholemew & Jowers, 2011)	Review of evaluation studies to determine the impact of Texas I-CAN lessons integrating PA with curriculum Evaluating: 1. PA levels 2. Teacher implementation rates 3. Time on task 4. Academic performance	Varies amongst studies 1. K-5 grades from 1 school 2. 25 teachers over 6 months of the intervention 3. Not specified 4. 6 Grade 4 classes	U.S.A.	Descriptive intervention Active lessons for 4 weeks Then 1 week following, pedometer for 2 days with active lessons & 2 days without – randomly assigned Measures: 1. Step count 2. Self report & spot checks by research staff 2 x / month 3. Observation of time on task 4. Retention of spelling	1. Average increase of 1,000 steps for all grades 2. Correlations between teachers a) rating high lesson quality, b) self-efficacy, c) perceived barriers 3. Enhanced time on task – 58% following a sedentary lesson, 93% following an active lesson 4. Enhanced 2 week retention of spelling $p < 0.05$	Strengths: Study included predominantly low SES children Limitation: Unclear differentiation between studies	Lessons increase the step count of students Neither teacher BMI nor personal PA levels were associated with lesson implementation Students' time on task and spelling retention is improved following PA	The Texas I-CAN lessons may be beneficial for other teachers to integrate physically active lessons in elementary grades

(Donnelly & Lambourne, 2011)	Describe the impact of classroom based PA on: 1. BMI & 2. Academic achievement	1342 children began in grades 2-3; 24 elementary schools 665 boys 677 girls	U.S.A.	3 year longitudinal cluster RCT 10 minutes active lessons with a goal of 90 min/week Measure: 1.Accelerometer Observation 2. Weschler Individual Achievement Test—2nd edition. Assessed reading, writing, math, spelling, & oral language skills	1. Less increase of BMI over 3 years (1.8 BMI in intervention group, 2.4 increase in BMI in controls) 2. Enhanced test results on a standardized test (6% increase on intervention group & 1% increase on controls) $p < 0.02$	Strengths: Use of a control group Sustained use of program measured PA occurred in the classroom or alternate locations such as hallway Limitation:	Teachers actively participating was directly related to the students' PA levels 9 months following intervention, only 55% of teachers were using PAAC 2-4 days/week	Physically active lessons result in improved academic achievement scores. Future research examining effects of more vigorous intensity PA may produce larger benefits to BMI & academic achievement
(Erwin et al., 2012)	Pilot study to determine the effect of a classroom PA intervention on: Whether curriculum based measures	29 children in grades 3 Intervention: 16 students Control: 13 students 2 classrooms	South Eastern U.S.A.	Quasi-experimental design 20 weeks of 20 min PA breaks / day Measure: Pedometers	PA had a positive effect on students' CBM reading & math scores Reading: $p < 0.01$ Math: $p < 0.01$ Intervention groups had higher reading fluency,	Strengths: Control group Limitations: Only 1 class for intervention	Likely CBMs are more sensitive to smaller incremental gains on academic achievement than standardized testing scores	Short PA sessions can impact math & reading fluency scores Teachers should be encouraged to include PA during academic learning

	(CBM) are useful as a tool for measurement when compared to standardized testing (traditional measures)			Reading, Mathematics, Grades, Standardized test scores	math scores, & higher grades		PA may be more beneficial for mathematics improvements	
(Kibbe et al., 2011)	Ten year review of 14 TAKE 10!® studies	Grade K-6	U.S.A.	Review of 14 studies – methods varied 10 min PA lessons Measure: Pedometers BP BMI Accelerometers Observations Florida Comprehensive Achievement Test	Student experience higher PA levels, higher rates of moderate to vigorous levels of PA, and higher caloric expenditures Improved reading, math, spelling, & composite scores $p < 0.01$ Reduced time off task following PA	Strengths: Review of over 14 studies	Teacher modeling of PA lessons resulted in increased student levels *Although teachers do implement the TAKE 10!® activities into their classrooms, the characteristics of those teachers are not clear	Classroom PA is a feasible way to increase student PA levels and can be integrated with academic lessons Further research is needed to explore teachers who sustain their use of PA
(Mahar et al., 2006)	Evaluation of classroom based PA (Energizers) program on	1. PA assessed in 15 classes at 1 public school	North Carolina, U.S.A.	RCT 10 min/day of PA lessons for 12 weeks	1. Intervention group took 782 more steps than control group	Strengths: Use of a control group Limitation:	The average daily in-school steps for all grades improved from 8-10%	This classroom based PA program was effective for increasing PA levels of students and their time on ask

	students' in-school: 1. PA levels 2. On-task behaviour	2. On task behavior assessed in 2 randomly selected grade 3 & 2 randomly selected grade 4 classes 243 children in grade 3-4 Intervention group: 135 Control group: 108		Measure: Pedometers Observation	2. On task behavior statistically significant $p < 0.017$	Teachers were told which week their students would be assessed for PA Observers knew if the students had received the PA		behaviour during academic instruction An increase in 782 steps/day per school year can have important health implications
(Reed et al., 2010)	Examine impact of PA integration on student fluid intelligence & academic achievement	155 students in grade 3 6 classrooms INT group: 80 Control group: 75	U.S.A.	RCT 30 min/day of PA within lessons 3 days/week for 4 months Measure: Pedometers BMI Non-invasive fluid intelligence testing	1. 1200 more steps with integrated PA 2. Significantly better fluid intelligence test results $p < 0.05$	Strengths: Use of control group Limitations: Not having a pre-test Fluid Intelligence score for comparison	Students with higher BMI scored lower on the Fluid Intelligence tests	Evidence provided that PA can influence fluid intelligence and should be considered as a way to promote cognitive development in elementary aged children Children can learn through activity with content, hence integrating PA with curriculum may provide more student

	involvement with learning

APPENDIX D: SYSTEMATIC REVIEW

Reference	Aims	Participants	Location	Methods	Results	Strengths/ Limitations	Key Findings	Conclusions
(Singh et al., 2012)	To describe the relationship between PA & academic performance	Systematic Review of the Literature 14 studies were identified 2 studies were scored as high quality	12 U.S.A. studies 1 Canadian study 1 South African study	10 observational & 4 intervention studies were identified	14 studies were reviewed and rated for methodological quality	Limitation: Self-reporting of PA by parents & students Academic results were self reported rather than tested following a session of PA	PA is positively related to academic achievements	Few studies of high methodological quality. There is a need for more high-quality studies on the does-relationship between PA and academic testing

APPENDIX E: ACCESS TO PARTICIPANTS

UNIVERSITY OF CALGARY

June 26, 2014

Dear [redacted]

I am a graduate student within the Faculty of Nursing at the University of Calgary. From my past experience as a school nurse and my interest in health promotion, I am seeking ethics approval to conduct interviews of teachers on the research question "What are the factors and processes that instigate and sustain teachers' use of Physical Activity in the classroom?"

It is the expectation of the Calgary Conjoint Research Ethics Board that upon submission of my Research Proposal, I will also provide a letter indicating that I will have "access to participants." My focus is on elementary school teachers of grades 1-6 classes who currently use physical activity within their classroom strategies (not including physical education).

I am requesting your signature on this letter signifying that the Calgary Board of Education is willing to provide the contact information of this researcher (Christine Foran) to appropriate teachers or principals for the purposes of recruitment and conducting of interviews on teachers' perceptions of their use of physical activity in their classrooms.

This is a letter of documentation to initiate access to teachers only. Ethics approval by both the Calgary Conjoint Research Ethics Board and the Calgary Board of Education is still to be gained.

Please sign and date if this letter is in accordance with your understanding.

June 30, 2014

Date signed

APPENDIX F: LETTER OF INITIAL CONTACT

September 11, 2014

TEACHERS WHO USE PHYSICAL ACTIVITY WITHIN YOUR CLASSROOMS:

My name is Christine Foran, and I am a Public Health Nurse, working as a masters graduate student within the Faculty of Nursing. I am interested in researching teachers' use of physical activity within their classrooms. I am aware of the many challenges that exist in trying to get children active. In particular, I would like to hear what teachers' perceptions are on their experiences related to their use of physical activity.

I would like to interview teachers of grades 1-6 in the Calgary Board of Education schools who currently use physical activity in their classrooms. The interviews would take 30-60 minutes, and will be audiotaped. A time and location will be chosen that is most convenient to the teacher.

Please consider taking part in this research project to give voice to the important perceptions of teachers who currently use physical activity within your classrooms.

For more information, please contact me at:

[redacted]

Christine Foran RN, BN

APPENDIX G: INTERVIEW GUIDE

INTERVIEW GUIDE

The following questions will be used to guide the interview. The interviewer will use discretion as to how the questions are asked, and if the questions will be used. The questions and the wording chosen will depend upon the answers received. The interviewer will ask subsequent questions for elaboration on answers.

1. Please tell me how you started using physical activity in your classroom?
2. Can you describe a typical day where you would incorporate physical activity?
3. Can you describe any "supports" that are in place that you feel encourage your use of physical activity?
4. What has the response been from other teachers in your school?

Of note, after several interviews, the researcher may discover certain themes that need to be further examined, and may change or add to the questions as deemed necessary.

APPENDIX H: CONSENT FORM

Consent for Teachers
Informed Consent

TITLE: Health Promotion Through Physical Activity in the Classroom: Exploring Teachers' Perceptions

INVESTIGATORS: Gayle Rutherford, RN, PhD

Christine Foran, RN

Christine Foran contact: [redacted]

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, please ask. Take the time to read this carefully and to understand any accompanying information. You will receive a copy of this form.

BACKGROUND

Physical activity in classrooms, distinct from physical education classes has been shown to increase learning in children in grades 1-6. Using physical activity in the classroom is a teacher led initiative. We are interested in the perceptions of those teachers who are known to use physical activity routinely within their classrooms in Calgary Board of Education schools. This study invites homeroom teachers of grades 1-6 to speak about their use of physical activity within their classrooms and the perceived benefits to their students.

A qualitative grounded theory research method will be used.

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of this study is to describe and understand teachers' perceptions of the use of classroom physical activity during the school day. The study will give voice to teachers and their experiences using physical activity, with an emphasis on any perceived academic benefits to students.

WHAT WOULD I HAVE TO DO?

You will be asked to participate in one interview lasting no more than one hour. You will be asked to sign a consent form and will be provided a copy to keep.

The interview can take place at the location of your school classroom after school, on a date convenient to you. The interview will be audio-recorded on an iPad (and also an iPad mini to make sure no technology problems are encountered). The interview will then be transcribed analyzed by the researcher.

WHAT ARE THE RISKS?

There are no known risks to participating in the study.

WILL I BENEFIT IF I TAKE PART?

There are no identified direct benefits to participation in this study. Your participation would be considered helpful in understanding teachers perceptions and their use of physical activity in their classrooms. It is hoped that other teachers may benefit from learning about your experiences in using physical activity during the school day.

DO I HAVE TO PARTICIPATE?

Your participation in this study is completely voluntary. You can withdraw your participation at any time. There will be no negative outcomes should you should you change your mind or choose to stop part way through the interview. If you choose to withdraw from the study during or after the interview, you will be asked if the interview data to that point can be used for the study. Each interview informs the researcher and progresses the next interview. Therefore, if following an interview you decided that you no longer wanted your data included in the study, I would ask for you to inform me within one week following the interview.

WHAT ELSE DOES MY PARTICIPATION INVOLVE?

There are no other components to this study other than what has already been described.

WILL I BE PAID FOR PARTICIPATING, OR DO I HAVE TO PAY FOR ANYTHING?

There are no costs to participate in this study, and there is no compensation that will be paid for your participation.

WILL MY RECORDS BE KEPT PRIVATE?

Your participation in the interview process will be treated confidentially. Your name will not be attached to any audio-recording of the interview, nor to any transcriptions of the interview. You

will have the chance to choose a pseudonym for yourself, otherwise one will be chosen for you. It will be this pseudonym that will be referred to in any of the subsequent reports. The list of participant names with their corresponding pseudonyms will be kept in a locked safe within the researcher's home office safe.
Please note that all efforts will be made to provide anonymity, however anonymity cannot be guaranteed.
Recordings of interviews will be kept for five years after the completion of the study, as stipulated by the Calgary Conjoint Health Research Ethics Board.

SIGNATURES

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a participant. In no way does this waive your legal rights nor release the investigators or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. If you have further questions concerning matters related to this research, please contact:

Dr. Gayle Rutherford [redacted]

[redacted]

If you have any questions concerning your rights as a possible participant in this research, please contact the Chair, Conjoint Health Research Ethics Board, University of Calgary at 403-220-7990.

Participant's Name	Signature and Date
Investigator/Delegate's Name	Signature and Date

Witness' Name	Signature and Date

The University of Calgary Conjoint Health Research Ethics Board has approved this research study.

A signed copy of this consent form has been given to you to keep for your records and reference