Investigating How Teachers Effectively Implement Cross-Curricular DPA, and Identifying Perceived Benefits and Barriers Associated with Cross-Curricular Daily Physical Activity

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Abstract

The purpose of this study was to investigate how educators in the Greater Toronto Area (GTA) were implementing Cross-Curricular Daily Physical Activity (DPA) in their classrooms, along with highlighting perceived benefits and barriers when implementing DPA. Research has shown that obesity rates in children is on the rise, moreover the Ontario government has set out a policy that requires educators to implement 20 minutes of DPA per day. Research has also shown that physical activity has benefits on both body and mind which may contribute to improved personal wellbeing as well as academic achievement. Due to educators placing greater emphasis on core subject content, educators tend to shy away from providing students Ontario mandated DPA minutes. The data collected for this study was collected from two semi-structured interviews with teachers who have a varying degree of experience with cross-curricular DPA practices. The findings from this study are discussed and shed light on implications regarding cross-curricular DPA, from which recommendations are made for administrators and educators to better employ DPA in their practice of teaching. Suggestions for future research are provided to further our understanding of DPA as to improve the quality of current practices.

Key words: Daily Physical Activity, DPA, Cross-Curricular DPA, Integrated DPA, Physical Activity, Physical Literacy, Physical Education, Middle School, Physical Movement
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CHAPTER 1: Introduction

1.0 Research Context and Problem

In recent years, legislature has pushed for more instructional time in schools resulting in less time devoted to programs such as physical education and unstructured playtime (Burton and VanHeest, 2007; Fedewa & Ahn, 2011). These changes in elementary and middle schools have placed an enormous pressure on teachers and administrators, leaving them accountable for improving academic achievements amongst students, to the detriment of students’ physical health education (Maeda & Murata, 2004). Moreover, children are developing poor eating habits leading to sedentary lifestyles whilst further decreasing physical activity, thus, increasing the prevalence of obesity and overweight status which increases the risk for diabetes, high blood pressure, heart disease along with other negative health factors (Maeda & Murata, 2004). Though obesity is known to be a current epidemic issue amongst children, being overweight has also been identified as a marker, though not as a factor, which negatively affects academic achievement (Burton & VanHeest, 2007). Unstructured play time (i.e. recess) is an opportunity for students to not only improve their physical health, but also to release stress and energy, to develop autonomy, to practice making and applying choices, and to practice establishing and respecting rules (Burton and VanHeest, 2007). Unstructured play time and autonomy at recess can allow children to develop positive peer relationships, which can contribute to building a more engaging and collaborative learning environment (Burton and VanHeest, 2007). However, even recess time doesn’t necessarily mean children are getting adequate exercise. Boys and girls, on average only exercise twenty one to twenty eight minutes respectively during all allotted recesses in a given day (Rigres, Stratton, & Fairclough, 2005). This suggests that not all students
are meeting recommended levels of exercise, and the exercise alone may not be sufficient depending on the type and intensity. There is strong evidence to support the notion that currently children are not meeting the daily requirement of 30-60 minutes of moderate the vigorous physical activity daily (Fedewa & Ahn, 2011). Be it through structured or unstructured physical activity practices, students are deprived of adequate levels and time for physical movement.

Physical activity has been linked to numerous psychological, physiological and physical health benefits (Burton & VanHeest, 2007). These benefits include a reduction in health risks associated with obesity, overweight status, whilst improving cognitive function which may potentially lead to higher academic results (Burton & VanHeest, 2007). Fedewa and Ahn (2011) showed that small group physical education interventions may elicit better academic and physical outcomes compared to medium sized interventions. Salvy et al., (2009) concluded that smaller group interventions increased participation amongst overweight youth through peer motivation. This could prove to have significant positive effects as children who are overweight are more at risk for under achieving on standardized testing compared to their more-fit peer counterparts. Smaller group sizes, similar to those seen in today’s classrooms may therefore prove most beneficial in attaining strong academic achievements. Moreover, relatively short bouts of increased physical activity enhances arousal while minimizing fatigue and boredom (Fedewa & Ahn, 2011). These findings suggest that implementing short bouts of daily physical activity benefits students both mentally and physically. This may ultimately foster better classroom attentiveness, intrinsic motivation for distracted learners, collaboration amongst peers, inclusiveness which alleviates classroom anxiety, attenuating stressors, and increasing student participation in a positive learning environment. Maeda and Murta (2004) favour schools as an ideal place for the development of healthy habits whilst attaining optimal participation amongst
students. Whitaker et al., (1997) concluded that obesity developed early in one’s life typically carries over into adulthood. Therefore it would be wise to develop healthy habits early in life in order to develop healthy individuals who can contribute positively to society and their personal endeavors. Short yet fun structured physical activities within the classroom may alleviate the hesitation of competitive habits typically seen in regular physical education classes. This would direct the focus towards cognitive, psychological, physiological and social benefits, thus, enhancing students’ overall learning experience through a holistic approach.

Unfortunately, physical activity, be it structured or unstructured has been constantly decreasing in lieu of academic priorities. In 1991, 42% of students typically participated in physical education classes; that number had decreased to 28% by 2003 (Burton & VanHeest, 2007). Relatedly reported that while 50% of elementary schools and 15% of middle schools nation-wide required physical education at the time of their research, only 5% actually provided children with a daily physical education class. In the United States, a physical education specialist is typically scheduled once a week or less, and in the State of Hawaii, classes are scheduled only once every two weeks (Maeda & Murata, 2004). This reoccurring struggle to increase nation-wide test scores has forced students to be exposed to longer instructional time in core subject areas; neglecting the importance of health benefits derived from physical activity affecting the physiological and mental health of the student.

If stakeholders of education would like to see academic achievements, it would be wise to investigate the importance of integrating DPA within the current elementary and middle school curriculum. As mentioned above, teachers and administrators are being pressured to produce academic results by overloading students with stagnant instructional time and content which may lead to an increase in stress, anxiety and unfavourable behaviours. As such, teachers
need to constantly be creative and resort to a myriad of teaching strategies in order to attain mandated academic standards. Mathematics and literature are the two most accounted for subjects with regards to standardized testing. Burton and VanHeest (2007) suggests it may be worthwhile taking time away from instructional literature and increasing daily physical activities in order to improve on mathematics and reading scores. Given the positive effects DPA has on students’ overall performance as illustrated through research, it would therefore be relatively important to recognize effective DPA practices implemented by exemplary educators, assess practical strategies and modes of implementation, as well as address key factors which constitute effective daily physical activity practices in order to provide adequate resources for educators lacking confidence or efficacy relating to this field.

1.1 Research Purpose

The purpose of this research paper is to draw attention to the importance of daily physical activity (DPA) which as research has suggested may in fact prove beneficial in improving students’ overall performance; physiologically, personally, socially and academically. Research suggests that physical activity has positive effects on cognitive outcomes in elementary and middle school children (Burton & VanHeest, 2007). Given current administrative pressures to improve academic achievements, it may be worth-while implementing cross curricular daily physical activity within the classroom that may very well elicit better behaviours and participation amongst learners as a means to support student learning without necessarily having educators feel time lost towards instructional practices. The purpose of this study will therefore be to examine the effects of cross curricular daily physical activity imbedded within the curriculum, assess the effectiveness of current cross curricular daily physical activity practices,
gain educators perspectives of benefits observed in students as a result of providing daily physical activity and identify successful strategies practicing educators are modelling. By addressing and better understanding these fundamental ideas, this paper will look to shed light on the benefits of DPA, and provide a useful resource for educators who may feel foreign or uncertain of the benefits or modalities for implementing effective cross curricular daily physical activity practices. By learning and gaining this valuable insight through literature and semi structured interviews, this paper will hopefully be better able to provide valuable knowledge regarding the benefits of cross-curricular DPA to the teaching community and highlight effective strategies educators are implementing to deliver quality DPA instruction.

1.2 Research Questions

The main research question that guides this study is: How are educators integrating daily physical activity practices into the curriculum?

Subsidiary Questions Include:

i) What effective strategies or resources are employed by practicing educators to integrate DPA in the curriculum?

ii) What are the perceived benefits of implementing Cross-Curricular DPA for students?

iii) What barriers to integrating DPA into the curriculum are identified by educators?
1.3 Background of the Researcher / Reflexive Positioning Statement

This field of research caught my attention because I can personally relate to stressors imposed similarly by teachers and parents to excel in school. I was fortunate enough to have an outlet through various extra-curricular activities, which in my opinion provided balance regarding development and growth. My educational background relates to the importance of physical activity and the positive effects that derive from exercise. Having completed a Bachelors of Applied Science degree, majoring in Kinesiology, with a focus tailored towards exercise science, I acknowledge the importance of physical activity, academics, whilst understanding the importance of a balanced lifestyle approach for optimal growth. I feel that adopting a holistic approach to life includes: exercise, a proper diet, and personal growth (emotionally, spiritually, cognitively) may foster positive attributes which will contribute to strong personal development. Fedewa and Ahn (2011) stated that children who are more physically fit tend to have higher cognitive function which translates to improved academic achievements. This statement is rather ubiquitous across literature, but not all. Through my past research, I have learnt that childhood obesity and negative physiological factors have in some way correlated or been identified as a result of sedentary lifestyle choices. It does not surprise me to see a decrease in academic achievement scores while at the same time seeing an increase in overweight status and childhood obesity rates. As a result of physical health and education time in schools decreasing, I find it would be vital to determine the outcome of this study and be able to address the importance of imbedding daily physical activity into the curriculum in order to recover lost physical activity time during the school day with a curricular driven approach. My goal in this research will therefore be to research what attributes educators observe from their students by having implemented daily physical activity in their classroom whilst identifying most
effective strategies these educators currently practice as a means of providing an outline or guide for educators lacking the confidence, resources, efficacy and knowledge of benefits physical activity plays on student performance.
CHAPTER 2: Literature Review

2.0 Introduction

In this Chapter I will review research on the benefits of integrating physical activity into the curriculum. Through the literature review, I will define physical activity and report current exercise recommendations for youth, address common barriers which contribute to the lack of DPA implementation amongst educators, touch on academic achievement gaps amongst students who practice active living versus those who lead more sedentary lifestyles, as well as speak to the benefits of exercise on cognitive function, neural adaptations, behaviour, psychological benefits, and academic achievement as a result of exercise. Through this research, I will attempt to prove that physical activity plays an important role in improving personal, social and cognitive performance, therefore increasing students’ health and academic achievement. By addressing the aforementioned benefits of physical activity, I will attempt to provide the knowledge for educators who shy away from providing daily physical activity in the classroom and address effective DPA practices educators may adopt in order to improve their students’ behaviour, attentiveness, classroom dynamic, and academic achievement.

2.1 Exercise Recommendations

The first Canadian exercise guidelines for youth were stated in 2002, whereby recommendations were said to increase exercise by 30 minutes regardless of current exercise frequencies done by children, and over a 5 month period increase those levels to 90 minutes of exercise per day (Janssen & LeBlanc., 2015). Janssen & LeBlanc (2015) conclude that children should build up in increments in order to meet exercise recommendations of 90 minutes per day,
60 minutes of moderate exercise (such as walking, bike riding) and 30 minutes of vigorous or strenuous exercise (such as soccer or hockey) for optimal health benefits. Currently, children are not meeting the National recommended 30-60 minutes of physical activity levels (CDC, 2003; Dowda et al., 2004; Plate et al., 2003). These recommendations coincide with findings from the National Association for Sport and Physical Education (NASPE, 2002). It is stated that these minutes do not need to be completed in bulk, but rather can be accumulated throughout the day; therefore breaking up physical activity throughout the day may suffice in seeing benefits from exercise (Gaus & Simpson, 2009). The DPA program in Ontario was launched in 2005, and requires that educators provide students grades 1-8, 20 minutes of physical activity in the classroom as part of curricular expectations for all students including those of special needs (Ontario, 2005; Patton & McDougall, 2009; Ramanathan et al., 2008). Small increments of physical activity, not as strenuous as that of a typical physical education class may be sufficient enough to dissipate sedentary behaviour (Saris et al., 2003). In light of this research, it should be noted that breaking up physical activity throughout the day by means of intra-curricular daily physical activity should not be a fixed solution, but rather an implementation aid in improving overall cognitive performance and physical health. Integrating physical education into the classroom environment dissipates problems with concentrating on tasks and alleviates childhood obesity whilst augmenting academic performance (Sherman, Collins, & Donnelly, 2007; Smith & Lounsberg, 2009). Embedding physical activity into the classroom is nothing new. Educators have already been performing such practices, believing that such activities allow students to wind down and relax, ultimately shifting focus more on core subject areas (Gaus & Simpson, 2009). Unfortunately, educators struggle to balance physical activity and core curricular subject content into the school day. Priority gradually keeps shifting towards academically tested
subjects (math, English, science). As such, more and more time is taken away from physical education, depriving students of physical activity which is believed to benefit both the body and mind (Stewart et al., 2004).

### 2.2 Barriers

The belief of increasing instructional time for academic gains contradicts research which continually advocates for increased physical activity due to the positive outcomes seen on student testing (Dwyer et al., 2000; Tremblay, Inman & William 2000). As a result of limited school time, academic accountability has increased pressure on educators, shifting focus towards improving student success in core areas like math and English at the expense of ‘lower status’ subjects including physical education (Maeda & McKenzie, 2004). Because of the focus on core subject areas, there is a resistance from administrators to allocate more time to physical education in lieu of academic pursuits through greater instructional time in order to prepare students for academic testing (Sallis, et al., 1999; Shepard, 1997; Tomporowski, 2008). A study done by Dwyer et al., (2003) stated that Toronto educators had three major concerns which made DPA difficult to execute in their classroom. Teachers felt that DPA and Physical education was a low priority, and given new Ontario curriculum demand expectations in priority subjects, there was insufficient time to incorporate adequate physical activity for students. Secondly, teachers felt obligated to the government and parents to attain desired academic results. Finally, teachers reported poor infrastructure and resources, ie, space and equipment necessarily to provide effective physical activity (Dwyer et al., 2003). This report by Dwyer et al., (2003) focused on generalist teachers who taught all subjects including health and physical education, and expressed the need for educational specialists as they felt it was necessary due to their lack of
expertise. Moreover, the report suggested that students participating in physical education class were not fully participating and thus not meeting the recommended moderate to vigorous exercise levels during that time (Dwyer et al, 2003). As indicated, common reasons for the lack of DPA implemented in today’s educational system derives from a lack of time, or time management, space, resources and or educator efficacy relating to DPA.

2.3 Achievement Gaps and Fitness Levels

It is imperative to acknowledge the importance physical activity plays on a child’s physiology, psychology and cognitive development (Graham, 2008; Hillman et al., 2008). Tomporowski (2008) observed that children who are overweight or obese correlate with having lower academic success as well as impeded intellectual function. London and Castrechini (2011) suggest that the achievement gap may exist as a result of the link between physical health and learning, in that physical health plays a role in academic achievement. Thus as the overweight and obesity rates rise, so may the increase in the achievement gap between fit and unfit students. Obesity tends to carry over into adulthood (Whitaker et al., 1997), and if poor physical fitness levels do in fact hinder academic success, then the development and success of the individual should be based on more than focusing efforts towards increased instructional time. Research done by London and Castrechini (2011) identified that the academic gap for persistently fit versus persistently unfit students begins to be visible in grade four. This correlation comes from the California PFT (Physical Fitness Test) study. London and Castrechini (2011) go on to show that children who are obese, particularly girls, exhibit lower self-esteem compared to non-obese. This finding suggests that such students may disengage from physical activity, which in turn may exacerbate sedentary habits and negatively affect their health, as well as academic performance.
Similarly, London and Castrechini (2011) have identified that higher Body Mass Indexes (BMI) amongst students correlate to lower academic test scores, again, suggesting that by combating sedentary behaviour and increasing physical activity may benefit students’ overall health and academic performance.

2.4 Effects of Exercise on Cognitive Function

A meta-analytical review done by Sibley and Etnier (2003) has shown that students who participated in physical activity improved cognitive function. Positive results were observed between those who did resistance training, standard physical education, and aerobic training. Regardless of training, academic improvements were noticeable and more prevalent in middle school children as well as elementary school children. Theories which try to explain findings suggest that a child’s ability to apply knowledge and to act when it is most advantageous correlates to exposure to physical fitness which may improve effective planning, working memory, task management, whilst inhibiting negative behaviour and improving concentrating on classroom instruction. Conversely, students who are not physical active or exhibit sedentary lifestyles struggle to perform as well as physically active peers (Tomporowski, 2008). Physically active students exhibit higher capacities for imagination, empathy, creativity as well as being able to regulate their thoughts and actions according to Barkley (1996). Moreover, additional classroom time devoted to core subject areas has not proven to increase academic grades (Berg, 2010). Carlson et al., (2008) observed that including an hour of physical activity into the school day will not have a negative impact on traditional educational skills. Furthermore, other researchers concur with this finding and stipulate that physical activity will enhance learning and
increase student performance (Chomitz et al., 2009; Davis, Miller & Naglieri, 2008; Tomporowski, 2008).

Buck (2005) conducted a study with adults and children looking at low and high levels of aerobic fitness. The study was looking at working memory and attention, measured using a Fitnessgram. The study was evaluated based on tests done on a computer task, and results showed that children responded faster and more accurately post exercise bouts. Another study performed on 6000 Korean children grades 5, 8 and 11 which evaluated physical activity, including running and jumping, showed marked grade point average improvements (Oh, Kim, Jang, Won, & Kim, 2003). It has been suggested by Castelli and Hillman (2007) that motor competence has positive effects on brain functioning. Studies conducted by (Casterino & Polak, 1999; Shepard & Trudeau, 2005; Symons, Cinelli, James & Groff, 1997) suggest that it is not simply physical activity, but rather the quantity and quality of physical activity that positively affects academic achievement in children. Overall, the overlapping studies continue to show marked improvements on cognitive improvement and overall health while increasing academic performance.

Through studies performed on animals and humans, it has been shown that physical activity produces an increase of neural connections, an increase in capillaries (which increases blood flow), and neurohormonal mechanisms which affect concentration and attention (Thomas et al., 1994). These neural adaptations have positive effects on overall cognitive performance. Furthermore, performing complex movements and using critical thinking activities stimulates the frontal cortex which allows for improved problem solving and learning skills (Jensen, 1998; Shepard, 1997). Thomas, Landers, Salazar, and Etner (1994) have stated that despite not knowing the exact mechanisms at play, physical activity has improved cognitive function,
especially scores accounting for math, accuracy and reaction time. Tomporowski (2008) has also stated that physical activity has favourable effects on mental processes, especially activities rich in learning context. Therefore, performing physical activity which incorporates critical thinking, and learning alongside exercise, strengthen cognitive development whilst improving general health. Tomporowski (2008) has stated that even though physical activity has shown positive cognitive results, tests that depict specific mental processes are hard to pin point. Various measurement and tests are sensitive to a given cognitive effect, therefore, Tomporowski (2008) has made it clear that systematic data needs to be further studied in order to better understand the effects of physical activity on a child’s brain and cognitive development. The key message presented in the aforementioned studies showed that the quantity and quality of exercise students were exposed to enhance learning as does the type and intensity of exercise provided. Therefore, it may be advantageous to provide students cross-curricular daily physical activity which encourages curricular derived or linked critical thinking while exercising; all the while upholding mandated curricular expectations and physical activity requirements.

### 2.5 Brain Development

A hypothesis on cognitive function gathered through empirical data confirms the ‘executive function hypothesis’. It is said these findings may be applicable to changes in a child’s brain. The hypothesis relates to specific regions of the brain which affects cognitive performance regarding tasks. Evidence has shown that grey matter increases very quickly during infancy and childhood, this suggests that learning and cognitive development is crucial during the first few years of a child’s life. Between the age of 7 and young adulthood, grey matter decreases whereas myelination and neural connectivity increases (Giedd et al., 1999; Sowell et
al., 1999). What this means is that in the first few years there is greater development in size of the frontal cortex, and after age 7, there is more myelination and connectivity which accounts for speed and efficiency of neural information, thus, thinking and processing information more effectively and efficiently. These findings suggest that after age 7, physical activity may play a vital role in cognitive development, leading to improved brain function and capacity. More specifically, tests done on neural adaptations suggest improvements in working memory, strategy implementation, response control, speed for processing; these neural adaptations carry into adulthood (Diamond, 2002). Nelson (2000) found that physical activity augments the development of various regulating factors such as neurotrophins, which help the growth, survival and differentiation of neural growth. Hillman et al., (2005) has stated that exercise may induce positive cognitive adaptations in children, more so than what has been observed in adults. This statement then concludes that development and capacity starts to taper off in adulthood. These findings suggest that providing children quality exercise is imperative for optimal growth and development; socially, physically and cognitively.

Colcombe and Kramer (2003) conducted a meta-analysis on older adults’ cognitive function by trying to find a connection between aerobic exercise to specific types of mental process changes. They concluded that gains were made through exercise, affecting: controlled processes, visuospatial processing, and speed processing. Other researchers (Cotman & Engesser-Cesar, 2002; Neeper et al., 1996 ) have similar findings whereby they have stated physical activity stimulates cognitive development, more specifically neural development and intersynaptic connections which in other terms refer to myelination as stated in the aforementioned studies. Another study done on animals has demonstrated that exercise increases
neural development, increases capillary density which allows for greater amount of blood flow to the brain (Kramer et al., 2002; Studenski et al., 2006).

Maeda and Murata (2004) stress the importance of physical activity and its effects on the mind. More so as it focuses on stimulating the brain, favouring positive effects on academic achievements as all three domains are targeted. These domains include: cognitive, affective and psychomotor controls whereby one should not take precedence over another. This simply suggests that physical activity has positive effects on growth development and processing abilities regarding cognitive function and ability. Burton and VanHeest (2007) concluded that aerobic fitness showed positive effects on cognitive functioning as it relates to attention and working memory. Students who improve their working memory are better able to problem solve, apply concepts, communicate, critical think, story tell and ultimately score better on standardized tests.

2.6 Neural Effects as a Result of Exercise

Cotman & Engesser-Cesar (2002) and Neeper et al., (1996 ) used animal studies to determine that several days of physical activity, specifically running, increased BDNF (brain-derived neurotrophic factor). This protein as also found in the Tomporowski (2008) study, has been linked to enhancing as well as repairing neural synapses. These synapses account for speed and efficiency of moving information. Studies have shown that animals who increased their BDNF could navigate a maze much faster (Kitamura, Mishnia, & Suguyama, 2003). Exercise has been identified in playing a key role in increasing energy levels and sparking motivation as key nerve transmitters are triggered (Meeusen, Watson, Hasegawa, Roelands & Piancinti, 2006).
Though these studies have been conducted on animals, the same processes and neural factors exist in humans which would infer that these findings regarding cognitive benefits would be seen in humans and are representative as a direct result of exercise.

Exercise has also been linked to the increase of Insulin-like growth factor (IGF-I). This hormone is secreted from skeletal muscle and acts similarly to BDNF. BDNF and IGF-I typically work with one another. Both the protein and hormone act as growth enhancers, repairing damaged nerves, causing angiogenesis (development of capillaries), and development of new neurons (Gomez-Pinilla, Dao, & So, 1997). These adaptations and changes derive in part from exercise and are seen to occur in the sensory and motor cortex. Similar changes also occur in the hippocampus, which is responsible for memory and learning (Cotman & Engesser-Cesar, 2002). The greatest amount of BDNF production has been seen when animals performed more complex tasks such as balancing and climbing, which posit that physical activity that is more complex may have added benefits to cognitive development (Anderson et al., 1996; Ratey, 2008; Swain et al., 2003). Tomporowski (2008) has suggested that based on studies which showed acute exercise bouts having positive cognitive results in adults and children, conclude that exercise done before learning may enhance information processing. These aforementioned studies imply that complex exercises involving critical thinking done before a given learning objective may enhance learning in that subject matter, moreover better create neural connections which allow for better knowledge retention.

Norepinephrine and endorphins are also key hormones which play a role in reducing stress, improving mood, increasing blood blow and ultimately providing a calming effect as a result of exercise (Taras, 2005). Cognitive function relating to: perceptual skills, academic achievement, verbal skills, mathematical skills, memory and readiness have been reported to
relate to physical activity and exercise (Sibley & Etnier, 2003). These are all adaptations which would greatly enhance students’ ability and mental readiness to engage and want to learn.

### 2.7 Exercise and Behaviour

Exercise plays a role in student behaviour as well. Exercise may provide positive effects on the nucleus accumbens which is responsible for emotional states. The nucleus accumbens is located between the motor system and limbic system. The nucleus accumbens plays a crucial role on emotional states (Greenfield, 1991; Mingote, Weber, Ishiwari, Correa, & Salamone, 2005). As exercise is seen to improve this factor, it suggests that physical activity therefore promotes positive feelings and may increase the readiness and attentiveness to learn (Berg 2010). Exercise also helps build on social benefits which may improve the classroom dynamic and support a safer and more inclusive learning environment (Taras, 2005). Taras (2005) stated that when children feel safe, share, cooperate, feel connected to their school and community, they are more likely to thrive and challenge themselves in school, thus leading to a higher state of learning. Taras (2005) also noted that attentiveness and willing to participate is greater in physical active students in contrast to sedentary students. Sahy and Colleagues (2009) found that students who are overweight are more likely to participate in physical education when influenced by peers. These findings are consistent through the literature and apply more to elementary and middle school children (Beets, Vogal, Forlaw, Pitetti, & Cardinal, 2006; Bukowski, Hoza, & Boivin, 1994). Social interactions and engagement seems to have a greater impact on student involvement, which also allows for greater student interaction, cultivating a positive and safe social learning environment. Fedewa and Ahn (2009), Jago et al., (2009) and Salvyetal et al., (2009) found that mixed gender physical education produced greater participation. Fedewa and
Ahn (2009) also stated that smaller group interventions for physical activity produced greater participation. Based on resources and play, more time, attention and opportunity may have been devoted to each student for participation. As a result, smaller group interventions were found to have greater cognitive and achievement outcomes. Therefore, the study concludes that students most at risk regarding academic performance may benefit from smaller group physical activity interventions due to peer motivation, interaction and attention devoted to their participation and engagement in physical activity.

Physical activity has shown to alleviate symptoms of depression and fatigue; moreover improve students’ concentration and attentiveness (Cotman & Egesser-Cesar, 2002). Koch (2013) found that the majority of learning occurs passively with minimal movement, thus creating a sedentary or passive learning environment. This learning neither helps academic progress nor does it decrease the current childhood obesity epidemic. This modality of learning is a one dimensional learning approach and deprives students of a rich learning experience. Research has also shown that physical activity may increase intrinsic motivation when movement is paired with learning objectives, which also results in higher academic achievement (Vazou, Gavrilou, Ma-Malaki, Papanastasiou, & D’Siomala, 2012). By improving motivation, self-esteem and instilling confidence in students through interactive exercise, time devoted to instructional learning may as research suggests in fact be used more efficiently.
2.8 Current Research on Academic Achievement

It has been observed that academic achievement scores increase when physical education time increased (Sallie et al., 1999; Shephard, 1997; Shephard, Lavallee, Voue, LaBarre, & Beaucage, 1994). Many other research studies reported similar findings (Sallis et al., 1999; Shepard 1997; Shepard, Lavallee, Voue, LaBarre, Beaucage, 1994). Etnier et al., (2006) has identified physical fitness as a moderator in enhancing cognitive function and these findings are consistent with (Cox, Schofield, & Kolt, 2010; Dollmn & Lewis, 2009; Hillman, Erickson, & Kramer, 2008; Sibley & Etnier, 2003). One of the proposed reasons for the effect of physical activity is that movement has a positive effect on increasing arousal while decreasing fatigue and alleviating boredom. Furthermore, physical activity increases self-esteem as well as strengthens neurological connections which may lead to overall improvements in cognitive abilities, thus, improved academics (Hillman et al., 2004; Hillman et al., 2006; Shepard, 1996). Coe et al., (2006) have identified moderate to vigorous physical activity as the most beneficial means to attaining improved academic grades.

One of the studies incorporated SPARK (Sport, Play, and Active Recreation for Kids) as a means to recognize the impact physical fitness has on academic performance. The program was designed over the 36 week school year, 3 times a week for 30 minutes per session, and the key focus was physical fitness and skill-fitness activities (15 minutes respectively). The study found that time devoted to physical activity improved test scores (Sallis et al., 1999). Similar studies found positive associations between physical activity and test scores, particularly in math (Maynard et al., 1987; Shepard et al., 1994; Thomas et al., 1994). Sallis et al., (1999) concludes physical activity is not detrimental to students’ academic achievement, but may serve to benefit the student beyond academia (socially and personally). Tomporowski (2008) observed similarly...
that children who exceeded physical activity requirements versus those who did not, showed higher academic grades.

A Canadian study conducted in the Three Rivers Project in Quebec in the mid 70’s found that students who had 5 hours of training per week versus students who trained 40 minutes per week exhibited higher grades. This study was done on students grades 2 through 6 and girls had slightly greater improvements than boys (Tomporowski, 2008). More recently, data gathered by the California Department of Education (2005) observed fitness scores by looking at body compositions, aerobic capacity, strength and flexibility; showing improvements in language arts and mathematics when coupled with physical activity. Academic scores of children in grades 5, 7 and 9 elicited similar findings to Tomporowski (2008), whereby higher grades were found when students were physically active. Another study done by Zervas et al., (1991) showed marked improvements in response time and accuracy regarding cognitive function amongst students who performed moderate to vigorous physical activity. The belief lies in that physical activity sparks arousal levels and may mediate faster response times post exercise to information processing and information retention (Davranche & Audiffren, 2004). Despite the many studies in favour of the positive effects on academia derived from exercise, it should be highlighted that in providing time for structured exercise, academic scores did not decrease, suggesting that more or equal time devoted to instructional practices does not necessarily produce better results. However, it does deprive students of a holistic learning approach whilst further endorsing sedentary behaviour.
2.9 Literature Summary

Fedewa and Ahn (2009) states that providing more time in physical education may improve academic achievement rather than impede it as currently thought by school administrators. Maeda and McKenzie (2004) study has noticed that educators still hesitate to incorporate physical activity into the school day despite being aware of the benefits physical activity elicit. As such, educators rather allocate time towards higher priority subject areas. Sallis et al., (1999) encourages school administrators to increase physical education time as a result of the research which illustrates both the physiological and psychological benefits that come from physical activity.

Tomporowski (2008) acknowledges that not all tests are sensitive to exercise and cognitive functioning. Also, it is not truly understood the exact modality of exercise which elicits the best benefit for academic achievement. Some studies lack substantial differences in children participating in studies and exercise interventions may be relatively different depending on the age and developmental level of the child. Given these concerns, it would suggest further research may be needed to better understand the relationship between exercise and cognitive benefits which may advocate for more physical education time as a means to a holistic student approach.

However, as acknowledged through reviewed literature, there’s a breadth of research which continually advocate for implementing DPA due to the myriad of benefits which stem from exercise. As discussed, these benefits include: improved neural development which augments cognitive function, behavioural and mental health benefits which help decrease anxiety, depression, and stress. These psychological and physiological benefits work in concert as to support academic achievement which also reduces the achievement gap amongst students whilst fostering positive habits towards healthy living, development and growth.
This research does not suggest that physical activity is the solution to academic achievement alone, but rather should be incorporated as a means to enhance learning, improve academic performance, whilst decreasing obesity trends by alleviating sedentary behaviour (Castelli & Hillman, 2007). Currently, educational systems are decreasing physical education and increasing instructional time in lieu of academic pursuits, without the implementation of physical movement due to misbeliefs that time devoted to exercise may further poor academic results.

Physical activity can be integrated into the school curriculum by performing kinesthetic tasks which incorporate critical thinking with movement whereby students use their bodies and tactile materials to enhance learning. Through such means, students are more engaged and on task (Koch, 2013). Physical education programs should be fun as well as permit choice and account for student interest in order to attain the highest level of engagement such that optimal levels of learning are reached (Castelli & Hillman, 2007).

2.10 Conclusion

According to Strampel et al., (2014), disintereed in their studies that educators preferred to not incorporate physical activity into their practice due to a lack of time, limited training, limited resources, and or space. Educators hesitant to implement daily physical activity expressed the need to focus on core subject areas, found daily physical activity disruptive to other classes, as well as a lack of support by administrators and or staff (Strampel et al., 2014). These barriers only further discourage educators from implementing daily physical activity whilst depriving students of a richer learning experience. As such, effective strategies need to be voiced and
recognized by effective teachers who advocate for physical activity in order to synthesize a beneficial resource for educators who still hesitate to adopt these practices as to augment academic achievement and enhance student potential. Limited research is however present in addressing the most effective and beneficial means of executing cross curricular daily physical activity, as well as the resources and knowledge to educate teachers the benefits of doings so effectively both for their interests and that of students. Despite the notion that more class time should be directed towards instructional practices amidst the abundance of research in favour of exercise for student development and growth, this research paper will therefore seek to better understand successful DPA practices currently in place by practicing teachers. As well as better understand teacher perspectives regarding DPA, identify examples of implemented strategies, and demystify barriers and concerns amongst hesitant educators who shy away from such practices which may inevitably enrich pedagogy within the educational community.
Chapter 3: Methodology

3.0 Introduction

The purpose of this chapter serves to provide an overview of the research methodology used, the sampling of and recruiting of participants, the instruments used to gather information as well as the process used to analyze data. This chapter will explain the ethical procedures that were followed in order to gather authentic and valid data by participants. Then, given my choice of methodological approach to conducting my research, I explain the strengths and limitations of a qualitative study. Finally I elaborate on core principles relevant to my methodological approach and justify the reason why I chose to follow such methodologies given my research purpose as well as what I hoped to gain through my choice of questions.

3.1 Procedures

The foundation of this research study is grounded in a qualitative research approach whereby I looked at literature, relevant to my topic, and conducted semi-structured interviews with teachers who practice integrated DPA. The benefits of qualitative research are that it ascribes to a social or human problem, the collection of data derives from a natural setting with individuals within the study parameters (Creswell, 2007). Finally, qualitative research uses inductive and deductive reasoning to interpret gathered information whilst establishing themes or commonalities, as well as allowing for reflexivity, thus, my interpretation and understanding of what was found relative to the research (Creswell, 2007). In order to collect valid data from participants, a series of interview questions were created (see Appendix B) targeting key elements pertinent to the research question. The Interview questions were specifically designed
to elicit answers from teachers who have expertise relating to daily physical activity in the classroom, moreover, those who integrate DPA amongst various subject areas. As outlined through the literature in chapter two, a greater amount of pressure is placed on teachers to produce strong academic results and this is commonly to the detriment of students’ physical health and well-being. However, the literature also shows that daily physical activity has many benefits, more specifically, the ability to increase working memory, processing and applying information. This study looks to better understand teachers’ perspectives, what they observe through the use of integrating DPA with the curriculum, as well as identifying associated strengths and barriers teachers face with this practice. The advantages to semi-structured interviews will allow me to gain better practical knowledge from experienced teachers in this field. I hope to gain a better understanding on the consensus of the culture amongst teachers as it relates to this practice, and hone in on what barriers exist or existed when first implementing this approach in order to produce strategies and general information for teachers who feel less comfortable or competent integrating DPA in their everyday schedule.

3.2 Instruments of Data Collection

The instruments for data collection used were semi-structured interviews. The protocol outlines that participants volunteered, gave full consent, and were aware of their rights to withdraw from the interview at any time. This allows for participants to feel at ease, alleviating any pressures or obligations towards the study. Each interview will last 45-60 minutes, and follow a pre-set series of questions (See Appendix B). Participants will be encouraged to elaborate on their answers. This will provide for in-depth data collection that may better the quality of the research. The data was recorded using a recorder, in order to later transcribe and
code as to uncover themes and valuable information pertinent to the research question. To ensure none-biased pre-conceived answers to questions, questions were not forwarded to participants in advance. This allowed for spontaneity and validity, again, limiting favourable or pre-conceived responses. This source of data provides for current and practical information pertaining to the research question and thus may further provide for a better understanding in what and how teachers perform and perceive the strengths or challenges/barriers as well as any unknown variables associated with integrating DPA into the curriculum.

3.3 Participants

The sampling criteria used to recruit participant candidates include the amount of experience with performing integrated DPA, the location in which they gained their respective experience, and the grades in which they taught and conducted their practices. The location in which teachers need to have had experience integrating DPA in the past or presently are limited to both the Catholic and Public elementary school boards within the greater Toronto area (GTA). The grades in which participants of the study need to have gained their experience would ideally be grades four through eight.

3.4 Sampling Criteria

Teachers recruited for this study met the aforementioned criteria of five years with regards to integrating cross-curricular DPA in their teaching experience. The reason for the chosen criteria was that it allowed participants to gain enough experience integrating DPA in the curriculum, thus, being able to better elaborate on demands teachers need to overcome, both
from administrators and stakeholders of education. This also allowed me to gain a better understanding of how teachers cope with upholding academic requirements whilst finding ways to implement daily physical activity into their schedule. It will also be interesting to find out what reasons drove these teachers to stay motivated and committed in providing DPA. The location in which teachers gained expertise in the field will be limited to the greater Toronto area, as my focus will be to better understand what type of methods teachers use locally and better understand what barriers teachers face with providing integrated DPA in the area I hope to soon teach in. The grades in which recruited teachers will have performed DPA will be restricted to grades four through eight. The reason is that lower grades typically have more hands on tasks in learning whereas grades four through eight begin to learn more theoretical concepts and students are commonly given fewer opportunities to be mobile or active within the classroom. Most importantly, I will be looking for participants who demonstrate leadership, commitment, and expertise in the field of DPA, more specifically those participants who feel strongly and passionate about integrating DPA through a cross-curricular approach.

3.5 Sampling Procedures, Recruitment

I am applying convenience sampling in my study. The reason for this is that given the limited time allotted for the research, this approach will allow me to save time and effort in recruiting my participants. The drawback to convenience sampling is that it may hinder credibility and or provide a lack information to work with (Creswell, 2007). In order to find ideal participants, I will be contacting former schools that I have worked with as well as former administrators and associate teachers. I plan on also consulting with Physical Education instructors at OISE (Ontario Institute for Studies in Education) in order to request participant
referrals. Moreover I will contact OPHEA (Ontario Physical and health Education Association) and provide an outline of my research topic, as well as the sampling criteria I am looking for. I will be asking that former teacher associates, administrators and organizations distribute my research topic along with my sampling criteria for participants in order to seek out qualifying, willing and able candidates.

3.6 Participant Bios

The participants which contributed greatly to my research paper both work in the Toronto District School Board TDSB. A brief description of the participants will be mentioned in this chapter, however, the identity of the participants is left anonymous and their names have been replaced with pseudonyms.

The first participant “Alyssa” has extensive experience in the TDSB. Alyssa has been teaching for 15 years, most of which was teaching grade 6 core-gifted students. Alyssa has also taught grades 7/8 rotary, grades 7/8 French, as well as grade 10 English. At the time of this study, Alyssa accepted an administrative position down south. However, while working in the TDSB the past few years, her more prominent experience came from teaching a grade 6 core gifted class. The school is based on rotary so Alyssa also taught grade 7 and 8 students as well. Each period was 55 minutes, and there were 6 periods in a day, not including the scheduled lunch break. The core class often has double periods, which was ideal for incorporating DPA. When Alyssa provided DPA instruction, it was typically during a double period and for a duration of 20 minutes.
The second participant “Lisa” is an occasional teacher in the TDSB. Lisa has been given ample teaching opportunities within the TDSB, more commonly within one specific school. Lisa’s teaching opportunities typically centers around teaching the junior and intermediate grades 6-8. Recently Lisa graduated from a 2 year Teaching program in Ontario where she was fortunate enough to gain teaching experience through 4 teaching practicums. When Lisa works in the aforementioned school as an occasional teacher, she is typically provided lesson plans ahead of time as to what grade and content she will be teaching on a given day. This allows Lisa to think and prepare DPA best fit for her upcoming teaching schedule.

3.7 Data Analysis

Upon completion of the interview process, I will first be analyzing the data recorded. This will be done by transcribing the data and referring to the research question as a guiding tool. Once the data has been collected, I will be coding by identifying categories of data and themes within these. Themes or categories may include the type or mode of DPA, the space, restrictions or barriers, perhaps the culture surrounding DPA in the school, time and or constraints. I will also be looking at null data, what teachers did not say. This is important in figuring out what is unknown and needs to be further investigated in order to get a better sense relating to the issues so that the research can provide a clearer resolve. Once I have collected the data and coded it, I will begin to make meaning or sense of the information by drawing on the literature reviewed as an interpretive tool. The importance of doing so will be to gain insight into what commonalities and differences exist between teachers’ approaches to DPA, beliefs about it, and supports and barriers to implementing DPA.
3.8 Ethical Review Procedures

In order to ensure that the research meets the highest standards regarding, credibility, validity, and authenticity, participants will be made fully aware of the research purpose. Furthermore, participants will sign consent letter which inform them of their rights to withdraw from the study at any time, withhold from answering any question should they choose to do so, and that all information will be kept confidential, including: anonymity of their identity (through the use of pseudonyms), and information provided for the study as well as the location of their respective experience. The information will be kept on my password protected laptop, and any data or profile information will be only seen by myself and research supervisor. Data and profile information will be held confidential and discarded within five years of study completion. This study will therefore, and should not affect participants in any foreseeable way regarding their personal or professional life. There are no known risks to participation. Questions pertaining to the study will be clear, straight forward and none leading as to ensure honest answers that will govern the research purpose. Before the data is analyzed so that they may confirm what has been written as a final approval of data authenticity.

3.9 Methodology Limits and Strengths

The strengths of conducting a qualitative study and interviewing teachers include the opportunity to engage their personal and practical experience and perspectives in the field of study which may be compared to that of the theoretical data derived from literature. This enhances the validity and is an opportunity for participants to reflect on DPA pedagogy, moreover the reasons, motives and purpose for choosing to do so. By conducting semi-structured
interviews, teachers can elaborate on their responses and I can probe further as necessary. Teachers will be able to speak to their experience and touch on the more relevant aspects that relate directly to the research purpose. Moreover, I will be able to identify driving forces behind what theoretical, practical and or other strategies teachers have researched or adopted in order to successfully practice integrated DPA. One of the limitations to the study is the sample size as I will only be able to interview a small sample of teachers; approximately three. The downside to this is that given the limited number of participants I will be unable to generalize the findings. Also the study is only limited to interviewing teachers. This limits other perspectives, such as those of: students, parents, personal observation, surveys, and any other trustees or affiliates who may have knowledge or experience relating to this topic.

3.10 Conclusion

In summary, this qualitative research study will involve semi-structured interviews with participants who meet the aforementioned criteria. The participants will be teachers with at least five years of experience gained within the greater Toronto area as it relates to curricular integrated DPA. Participants will be made fully aware of the research purpose, their rights to withdraw and complete confidentiality of information provided, as well as anonymity of their identity in order to avoid any unfavourable personal or professional complications. The strength of this study allow for in-depth data collection by posing questions which target and relate directly to the research purpose. However the limitations to this method lies in the lack of time and sample size. In the next chapter, I will be reporting the research findings.
Chapter 4: Findings

4.0 Introduction

This chapter presents findings gathered from the semi structured interviews which were conducted in the fall and winter of 2015. The two participants selected for this study demonstrated a breadth of knowledge in relation to structuring and executing cross-curricular daily physical activities within their respective classroom. The participants were educators whose experience comes from the Toronto District School Board, having taught in both the junior and intermediate level classrooms. By conducting semi-structured interviews with these participants, I was able to gain valuable information of commonly seen cross-curricular daily physical activity practices amongst educators and the school culture along with perceptions educators have towards DPA. More importantly, I was able to gather information as to what effective strategies or resources the participants of this study employed to integrate DPA in the curriculum, as well as identify common challenges that educators encounter in the process of incorporating DPA into their teaching practice such as: lack of time, space, resources and teacher efficacy.

After coding and analyzing the data derived from the interviews, there appeared to be three common reoccurring themes which reflect the challenges and current practices that reflect current cross-curricular DPA practices in the educational setting. The first theme elaborates on cross-curricular DPA practices. Sub themes that reflect these practices include:

i) Cross-curricular connections with curriculum

ii) Space alternatives to perform cross-curricular DPA

iii) Technology and Resources

iv) Participants increased efficacy towards cross-curricular DPA through practice
v) Advice by participants given experience with DPAs

The second theme describes perceived benefits of DPA as observed by educators. Sub themes which emerged include:

i) DPA: “They love it:” Alleviating student stress and enhancing focus

ii) Increased collaboration amongst peers

iii) Inclusivity amongst peers

The final theme discusses the barriers which deter educators from implementing cross-curricular DPA. Sub themes within barriers include:

i) Competing subject priorities limit time availability for DPA

ii) Subject priority due to academic pursuits

iii) Lack of space to provide DPA safely

iv) Low teacher efficacy towards implementing quality DPA

4.1 Cross-Curricular DPA Practices

Below are examples and strategies employed by both participants regarding integrating DPA with curricular subject content as a means to enrich students’ learning experience while providing Ontario mandated physical activity requirements. For optimal health benefits, physical activity minutes do not need to be accumulated in bulk, they can be dispersed throughout the day to achieve similar benefits (Gaus & Simpson, 2009). As such, lesser amounts of DPA are adequate as long as they are accumulated at one time of the day or another.
Integrating subject content with DPA allowed Alyssa and Lisa to explore alternative pedagogy that met curricular expectations as well as physical activity expectations.

4.1.1 Cross Curricular Connections with Curriculum

Cross-curricular DPA connections explore how the curriculum can be integrated with physical movement; with a focus on cognitive and physical development. As emphasized by Maeda and Murta (2004), schools are an ideal setting for children to develop healthy habits, and as elucidated through the aforementioned research in chapter 2. More importantly, physical activity has been seen to benefit students both psychologically and physiologically whilst improving students’ academic achievement (Fedewa & Ahn, 2009). However, Maeda and McKenzie (2004) acknowledge that due to administrative pressures, educators are still reluctant to incorporate DPA in lieu of placing greater emphasis on traditional subject areas. This study aims to show that educators can in fact teach to traditional content subject areas and concurrently providing DPA. This section will provide insight from participants regarding implemented cross-curricular DPA practices along with examples that illustrate the execution of DPA merged with traditional curricular subject content.

When discussing cross-curricular connections, this study explores the various examples participants have voiced regarding curricular subjects they have incorporated with DPA. Math and Literacy are the two most accounted for subjects regarding standardized testing (Burton & VanHeest, 2007). Both Alyssa and Lisa used math and literature in their cross-curricular approach to DPA. Integrated DPA in these subjects is important since these subjects often take precedence over all others in terms of time commitment (Burton & VanHeest, 2007). One of the benefits as
stated by Lisa is that integrating DPA “gets the students thinking about the subject while accumulating physical activity minutes. Hence, integrating a lesson plan with DPA allows for an ideal start relating to what students should expect to learn next”. Lisa integrated DPA as “a great hook for introducing the topic or subject I was working with”. Lisa goes on to say she has integrated “math and the arts” as well as “a bit of geography” and also “touched on literacy” when lesson planning with a cross-curricular intentions. Performing DPA in the library was an ideal space to effectively provide students DPA minutes. Alyssa strove to provide 10–15 minutes of DPA per day which is near the required amount of 20 minutes as required by the Ontario policy set in 2005 (Ontario, 2005)

Alyssa on the other hand has experience with cross-curricular DPA by integrating physical activity with subjects such as “Math, French, Social Studies, and Language”. Alyssa having much more teaching experience and experimenting with physical movement has practiced cross-curricular DPA more often, usually with the advantage of having a homeroom class that was situated in the library. Alyssa integrated DPA in her math lesson on rotations and relative positions of objects by incorporating “disco music – I call out rotations, reflections, translations – slide to the left – and they follow (Simon says style) and dance in between”. This strategy extended into “rotation geometry or measurement, running and timing or spinning and jumping.”

Lisa also integrated DPA to support learning in her math class. She described a lesson on sequences and patterning:

I explained to the students that we would be playing basketball, shooting hoops. The lesson was based around patterning where students were asked to make up 3 different patterns using any 4 of the conditions (additions, subtraction, multiplication, division).
The points counted based on the observing teams patterning design. As the one pair would get a basket in, the opposing team would say the first value, say it was 3, then the next time a shot was made, the opposing team would say 6, and the one after 9.

The objective of the game was to figure out the incremental or decrementing sequence based on students’ pre-designed scoring rubric. Though this could be a low intensity based game, Lisa made the point to say “to not just have students sit around, if the one pair made a basket, the other team had to do a certain exercise, like 5 jumping jacks.” In doing so, the game involved physical exertion as well as critical thinking. Therefore, integrating DPA serves to not only promote physical activity, but to support academic learning.

Another math example given by Lisa was the use of cards with single numbers on each card.

I would throw the cards up, and students would run to collect the cards. Each student would get two cards, and this was their problem. Having to do multiplication, one they solved their problem between partners, and I should clarify that each student had their own pair of cards, they would trade one card (creating a new problem), run to a station (in sequence) and perform a given task ex. Sprinting in one spot, shuffling left to right, jumping jacks, lunges, squats.

This game as explained by Lisa allowed students to move around while practicing to solve constantly changing multiplication problems. Lisa then went to say this game “led into an algebra lesson where students were multiplying into brackets”. The benefit of this game was that instead of having student’s access prior knowledge of their multiplication skills, Lisa arrived at the idea of having students practice their multiplication skills while performing physical activity.
Lisa also creatively integrated DPA into her geography lesson by facilitating an “around the world tour.” She selected specific music that was representative of a given region or country. Lisa said “as a class, we would jog slowly around the class in a line, I would play a tune, and as we would jog, I would ask which continent this may be from”. This game made connections between culture, country or continent and locations around the world while increasing DPA.

Although Math appeared to lend itself to integrating DPA, participants demonstrated that DPA may be integrated into a variety of subjects. Lisa has shown to incorporate DPA into Geography as well as the arts, stating that in art “I would use famous poses seen in art, and mimic those poses through physical activity movement”. Alyssa, though not explicitly explained through examples, alluded to the fact that she has integrated DPA with “French, social studies, and language”.

Regardless of subject area, the aforementioned examples are but some that demonstrate the implementation of physical movement with subject content is possible, manageable, as well as practical. Moreover, integrating DPA may support academic learning and achievement.

4.1.2 Space Alternatives to Perform Cross-Curricular DPA

As eluded to through the voices of both participants as well as research, space is always a challenge in providing adequate, subject specific and safe DPA practices. The current suggestions have been provided as per the experience of both participants which may benefit educators which struggle to find a feasible or practice means to find alternatives.

Dwyer et al., (2003) had stated that educators feel as though there is an insufficient amount of space and or lack of equipment to perform DPA. This statement is generalized for the
average teacher, as not all have the luxury of utilizing library space, moreover, other teachers are placed in portables. Furthermore, Alyssa has suggested alternative means of using space, these include “the library, hall, or out of doors”. The idea rests on the premise that educators should not feel confined to the walls in which they teach. Rather, educators should be proactive and utilize space that meets the needs for a safe space which can support a given DPA lesson. To that extent, educators need to be resourceful and plan in advance regarding what space in the school is available, as well as check weather forecasts due to the unpredictable weather experienced in Canada.

Lisa has shown to be very resourceful in accessing free space. Lisa has mentioned that “depending on the activity, I use the classroom in some cases, I go outside when the weather is good, and as mentioned previously, I use the gym when the Phys-Ed teacher has planning time”. Educators could benefit greatly by arranging time to utilize free gym space, or use the outdoors if the conditions allow for it.

4.1.3 Technology and Resources

Given the demand for 21st century skills, it would be advantageous to embed technology into DPA lessons to accompany curricular and physical activity expectations. The addition of technology, be it music, videos or alternative technology would be beneficial in supporting the range of possibilities in which DPA may be utilized across curricular expectations. As mentioned earlier, Alyssa has incorporated the use of “books, manipulatives, equipment, videos, music, podcasts” into her DPA’s. Similarly, Lisa used music when teaching Geography and would
utilize Google or ‘YouTube’ as technology supports for DPA and draw ideas to creatively instill lesson that would yield student interest and participation.

4.1.4 Participants Increased Efficacy towards Cross-Curricular DPA through Practice

The benefit of cross-curricular DPA allows for the integration of physical activity and learning. Educators’ efficacy typically increases when taking risks, going outside your comfort zone, being creative and synthesizing prior knowledge with new ideas. Lisa mentioned that she “Googled and found ideas or Youtube, but nothing really applied directly to what I have done. However, those ideas typically would Segway into something I did”. Also stating that “I would just try and think of something clever that would relate or tie into the lesson I was doing”. Lisa resorted to thinking outside her scope of practice, more so making an effort to being creative so that she could synthesize DPA with curricular expectations. One of the contributing factors which provided Alyssa the ability to feel confident in exercising cross-curricular instruction came from being resourceful and finding avenues that may elicit optimal participation. Alyssa stated that “we have loads of resources”. A few examples Alyssa used in her practice of teaching cross-curricular DPA include “books, manipulatives, equipment, videos, music, podcasts”. By making an effort to be resourceful and seek out DPA exemplars, Alyssa felt more confident in providing cross-curricular DPA that was relevant and fun for students. When speaking to Alyssa regarding the prevalence of classroom DPA and colleague practices, Alyssa said “I’d say DPA is under achieved. There is sporadic commitment among a few teachers. Too often – ‘go outside and play’ substitutes for DPA”. Alyssa’s belief is that “physical fitness permeates life – it’s not something reserved for the gym – it’s about everything we do”.

Moreover, Alyssa states that “physical exercise helps me to focus and I feel well and I draw on
that awareness when offering these opportunities to students”. It is clear that Alyssa’s values and beliefs towards physical fitness and associated benefits are deeply rooted and therefore evident in her daily practice as an experienced educator who advocates for DPA due to the many benefits that stem from exercise. Alyssa’s primary teachable is not physical education, though she makes a concerted effort to provide cross-curricular or regular DPA to students by simply exploring relevant resources which may be useful in her pedagogical practice.

Similarities between Alyssa and Lisa regarding DPA efficacy, stems from personal beliefs and enthusiasm towards physical activity, as well as being either resourceful or creative in lesson planning. Between Alyssa and Lisa, there exists a distinguished breadth of experience, subject specific knowledge and efficacy relating to given subject expertise. Regardless of subject expertise, educators should not avoid or dilute the quality of instruction in subject matter with which they may feel less familiar. Rather, as professional educators, an acceptable effort should be made throughout all avenues of education as to provide students a myriad of opportunities for optimal growth and development; psychologically, physiologically, and academically. Through a holistic pedagogical approach to teaching, educators themselves become students, thus, improving their efficacy in a range of teachable subjects; such as, but not limited to, cross-curricular DPA.

4.1.5 Advice by Participants Given Experience with DPA

The participants of this study were asked to provide their insight and advice for educators who shy away from providing students DPA. When asked what advice Alyssa had for educators regarding DPA given the barriers most commonly voiced, Alyssa simply said “you just have to
make time and do it, otherwise it won’t be done. Learn how to best manage your class time, gather resources on DPA and just go with it and try DPA”. As for advice that reaches beyond educators control but rather can be aimed towards administrators, Alyssa suggests to “schedule some break between classes, or establish the expectation that a recess break take place during a class”. This otherwise stated by Alyssa as a “timetabled break between class”. These ideas as simple enough, however, the opinions expressed are meant to encourage non-practicing educators of DPA to simply reach beyond their comfort and try DPA, to seek out resources and attempt DPA.

Lisa share similar views as Alyssa in saying “maybe setting specific time blocks in the day for teachers to work with”. Lisa also suggested the possibility of providing novice as well as not practicing educators “a seminar or tutorial, or to partner up with another teacher who does do DPA – so learning from a colleague”. Also Lisa mentioned that administrators should support their staff with resources. Moreover, Lisa also made the point of saying that educators could “co-construct activities and share these ideas to all staff, so that they have access to it as well”. This idea of a shared community of knowledge is nothing new in the educational system as educators who share grades typically communicate lesson plans in order to stay on track and in tune with colleagues with curricular expectations. This concept could be extended into DPA planning practices as well, and shared through all grades for teachers seeking “a kick start for doing DPA” as Lisa advocated, for educators who feel inexperienced, skeptical or unsure how to integrate DPA practices.
4.2 Perceived Benefits of DPA Observed by Educators

Drawing on the semi-structured interviews, participants from the study noticed various benefits after performing cross-curricular DPA with their students. These benefits attribute to stronger classroom cohesion, collaboration, inclusivity, peer relations as well as intrinsic benefits as observed and perceived by educators through students’ behaviour post DPA.

4.2.1 DPA: “They love it:” Alleviating student stress and enhancing student focus

Moderate to vigorous exercise yields psychological, physiological, cognitive and emotional benefits (Cotman & Egesser-Cesar, 2002). When looking to support and improve on student development, exercise has shown to alleviate symptoms relating to depression which is becoming more prevalent in society today (Cotman & Egesser-Cesar, 2002). Moreover, exercise reduces fatigue which allows for greater concentration and attentiveness on given tasks as stated by Cotman and Egesser-Cesar (2002). As stated in chapter 2, Barkley (2010) noted that exercise fosters higher capacities for empathy and students are better able to control their thoughts and actions. This in turn allows students who tend to deviate from acceptable behaviours in the classroom to better cope with classroom expectations and etiquette.

When speaking to Alyssa, she noticed that cross-curricular DPA “helped students to focus, become more mindful” as well as “release tension and stress”. Koch (2013) mentioned that for the most part learning is done passively in schools with limited movement. This may contribute to disengaging students who will disengage from participating and learning at optimal levels. Alyssa noted that exercise allows students to dissipate built up energy and regain focus. When asked how students respond to cross-curricular DPA, Alyssa said “they love it, and it
helps them to release tension and work better when they come back”. This suggests as Alyssa has observed, that once students finish their DPA exercise, they are more engaged and ready to learn with greater focus and interest.

Lisa observed similar benefits from her students after providing cross-curricular DPA. She mentioned that students “all get involved and feed off each other very well,” also students are “willing to focus on the lesson”. This statement seems to suggest that students enjoy exercise and fully participate in such activities. As seen through literature, small group interventions increased student participation regarding exercise, more so for students who are higher at risk for obesity due to peer motivation Salvy et al., (2009). Moreover, Rigres, Stratton and Fairclough (2005), found that boys and girls are not necessarily meeting daily physical activity requirements during recess. This would imply that structured DPA activities such as cross-curricular DPA helps students to meet DPA requirements. As opposed to instructing students to “play freely” outside as Lisa mentioned which mimics recess time activity levels which typically do not increase student physical activity minutes. Lisa also mentioned that she would “typically see students disengage from lessons”, however, “after DPA, they are more alive and in tune with what’s happening”. Similarly to Alyssa’s observation, Lisa stated that “students love DPA”.

As reported through literature and the semi-structured interviews by both participants, noticeable benefits have been observed after providing students cross-curricular DPA. Furthermore, students enjoy DPA and are more inclined to participate. The overall benefit is that students are given opportunities to let off some steam, de-stress, and enhances their willingness to participate in the learning process.
4.2.2 Increased Collaboration Amongst Students

A key attribute to enhancing student learning is through guided inquiry learning whereby students collaborate and seek to find and understand knowledge. Collaboration encourages peer to peer learning and knowledge sharing, as in some cases students learn better from themselves. Burton and VanHeest (2007) eluded to the fact that exercise can contribute to a more engaging and collaborative learning environment.

Alyssa used cross-curricular DPA to “build confidence and classroom cohesion.” When students perform fun activities such as those seen through exercise, they are more inclined to work cooperatively as everyone is having fun. Competition, often seen in traditional physical education classes does not play a role in classroom DPA, rather, students are enjoying themselves whilst building on curricular expectations through fun, non-competitive engaging ways.

On that note Lisa mentioned that cross-curricular DPA “builds students’ confidence because they are having fun with each other in the same space.” Lisa noted that when students finish their DPA lesson, they are already engaged in the material and have already begun to collaborate with peers throughout the activity process. Moreover, the transition from exercise to seated work seems seamless amongst students and the level of involvement and participation is observed to be greater compared to regular collaborative instructional practices.

Pedagogy which employs collaborative practices seems to yield an inclusive classroom culture which enhances students’ willingness to take risks as they feel safe and a part of the learning process (Taras, 2005). Both participants have acknowledged that physical exercise has the potential to increase collaboration amongst students through fun and engaging activities.
4.2.3 Inclusivity Amongst Peers

Similar to collaboration, inclusivity is another valuable factor which encourages students to work together with all students, cultivating a safe and respectful learning environment. The Greater Toronto Area (GTA) prides itself in being diverse. Many people come from different cultural backgrounds, with varying personal character traits and identities unique to each individual. However, adversity is still seen to be somewhat a challenge in society and amongst the educational system. As such, pedagogical practices which foster collaboration and inclusivity beginning at younger ages better prepare students for the future where they will need to collaborate with a diverse population in the workforce.

As already touched upon earlier, Alyssa observed that by providing exercise with objectives seemed to “develop social skills, build confidence and class cohesion.” It may sound intuitive, however, when students are engaged in stimulating yet fun activities, it dissipates differences between students; yielding inclusion and teamwork to solve problems. The more inclusivity is endorsed and acted upon, it seems that it becomes less of a burden to do so beyond exercise based activities; it permeates into classroom expectations. Furthermore, Lisa added that DPA was “a great way to build relations between students and myself”. Inclusivity is not merely exclusive or limited to peer to peer relations, but also peer and teacher relations. This is an important concept because if students are to learn at optimal levels, they need to feel as though they can relate as well as respect their teacher. Lisa also made the point of saying that DPA “provided opportunities to build a good class community because students would all enjoy the same task and interact, laugh and just be themselves for a few minutes”.

Inclusivity and collaboration work in tandem to produce desired effects. As mentioned in chapter two, exercise has the potential to yield improved classroom dynamics, supportive of a
safer and inclusive learning environment (Taras, 2005). Taras (2005) also observed that when students feel safe, connected to their school community, and included in their learning environment, they tend to thrive academically; thus reaching a higher academic potential. For these reasons, it is essential to create a safe and cohesive learning environment in which students are provided an ideal learning environment, one that elicits fin activities, is interactive, and has curricular focused DPA practices.

In summary, participants observed that DPA benefitted students by enhancing their capacity to relax, be alert, engage, focus, maintain interest in subject matter, and do so while supporting a more inclusive classroom community. These findings converge with research regarding benefits that exercise has on behaviour, one’s psychological state and well-being which positively correlates to participation and willingness to exert effort towards a task. These benefits should be endorsed, encouraged and advertised as positive contributors to student learning. If educators and stakeholders of education have the best interest of students and their respective academic success, then cross-curricular DPA practices should be revered and as such become common practice.

4.3 Barriers which Deter Educators from Implementing Cross-Curricular DPA

After analyzing the data, a few reoccurring challenges seem to present themselves. These challenges deter teachers from implementing cross-curricular DPA. The barriers are found to be fairly consistent between interviewees. In light of both participants experiences, and the literature on the topic, the issues raised here need to be addressed in order to take the next steps in increasing mandated expectations of DPA minutes in schools.
4.3.1 Competing Subject Priorities Limit Time Available for DPA

Time is a precious commodity for educators when taking into account managing mandated curricular demands enforced by administrators while balancing or structuring daily lesson plans. Due to instructional focus geared to core subject demands, teachers are more hesitant to pursue alternative avenues relating to their pedagogy and subject preferences (Sallis et al., 1999; Shepard, 1997; Tomporowski, 2008). Both participants alluded to the fact that in their experience they found that most educators are unwilling to incorporate DPA into their teaching practice. Alyssa and Lisa endorse DPA practices and believe students should be given opportunities as it provides students a holistic approach to learning; teaching more than just content. However, this is still a challenge as expressed by participants because a conscious effort must be made and acted upon in order to ensure they are providing students mandated DPA minutes.

Alyssa’s school operates on a rotary system, whereby students move from class to class each period to learn different subject content. Alyssa primarily teaches grade 6 core as her homeroom classroom, and teaches grades 6-8 at other times of the day. Her home room class sees her for 2-3 times a day depending on the day of the week. The challenge expressed by Alyssa stems from having a lack of time with her students, and even more so with visiting students from other grades. Each period is 55 minutes, and Alyssa mentioned as teachers “we need TIME.” Point being, it’s hard to incorporate DPA practices while upholding to curricular expectations. Despite this challenge, Alyssa still makes a concerted effort to implement DPA wherever possible.

The school in which Lisa teaches also runs on a rotary system. Similar to Alyssa’s voiced concern, Lisa made the point of saying “teachers are always behind and rushing to complete
curricular expectations.” In saying so, Lisa is referring to the fact that time is selectively distributed amongst core subjects, and if time permits, other activities such as DPA may fill the void. Lisa also stated that there is “a loss of time due to students moving between classes. By the time students come into the classroom and are ready, it takes some time”. It appears the transition of students moving between classes takes up valuable time. Students often have to go to their lockers, change books, and make their way to the next class. By the time students arrive and are ready to begin, time has elapsed and this takes away from instructional time, moreover, time that could be utilized towards DPA. Alyssa has also made a similar point that “rotary only allows us short time blocks”. Again, this suggests that the transition time cuts into valuable time that could be used more effectively.

Time is certainly a precious commodity for educators as there is a great amount of content to cover, especially with schools which operate on rotary systems, not to mention various interruptions such as: assemblies, announcements, school trips. The pressures placed on educators by administrators and stakeholders of education make it that much more difficult to incorporate DPA practices, unfortunately to the detriment of a holistic student focused pedagogical approach. However, as research has shown, physical activity can play a key role in enhancing student learning. By integrating lessons with core subject matter, time would be used more efficiently, ultimately improving academic achievement and student development (Coe et al., 2006; Sallie et al., 1999). The challenge continues to be, how to best embed DPA practices as to be efficient with time management.
4.3.2 Subject Priority Due to Academic Pursuits

Time limits constrain teachers’ capacity to provide a higher quality of education for students. This results in the choices made by educators as to what form of pedagogy and subject content should take precedence in order to please stakeholders of education regarding students’ academic success. One of the concerns as stated by Dwyer et al., (2003), mentioned that educators sense of obligation towards parents and the government regarding academic achievement lead to lowering their priority in providing sufficient DPA. In lieu of these imposed values, core subjects are seen to be given greater instructional time. Burton and VanHeest (2007) stated that math and literature are the two most taught subjects due to standardized testing. As such, a greater emphasis is placed on ensuring students cover core content in hopes of increasing test results, to the detriment of students’ physical health. However, these authors suggest that it would be beneficial to include DPA practices in order to improve math and reading scores.

Alyssa stated the current educational system emphasizes “excessive focus on meeting all curricular expectations rather than teaching the whole child”. The idea of teaching the student as a whole refers to a holistic pedagogical approach whereby the student is exposed to a variety of subject content as well as the style in which it is taught. By providing a breadth of instructional practices, we increase the interest level and engagement of the student which in turn would provide a greater capacity for learning and understanding (Barkley, 1996). Despite the struggle to use time effectively, Alyssa stated that there needs to be a “less institutional focus on strands and achievement categories and more on teaching the child”, suggesting that pedagogy should encompass more than just subject content instruction, but incorporate other valuable practices which will benefit the student, student engagement and overall learning.
Lisa also made a similar comment in that “teachers focus more on core subjects, especially at grade levels geared towards standardized testing”. This again reflects the need to ensure students are meeting adequate test levels. Once again, this focus towards more instructional time for core subjects takes away from mandated physical activity time, which, as made clear through research, could potentially augment current test results.

Berg (2010) stated that exposing students to greater classroom time tailored towards teaching core subject content has not proven to increase academic grades. Moreover, incorporating physical activity time into the school day has proven to have no negative effect toward students’ academic performance (Carlson et al., 2008). Therefore, it may be beneficial to use time more efficiently and increase the prevalence of cross-curricular DPA practices in order to attain mandated physical activity requirements for students whilst improving on both student growth and academic achievement.

4.3.3 Lack of Space to Provide DPA Safely

Given the Canadian climate, and school taking place during the fall/winter/spring months, weather may play a vital role in determining whether outdoor activities are feasible and safe. More often indoor physical activities, especially those structured around cross-curricular initiatives are preferably done indoors. As such, space becomes a concern depending on the classroom size, student population and classroom layout. When performing physical activity in the classroom or on school property, like any other activity, teachers should always ensure students are performing required tasks safely and under supervision.
When performing physical activities in the classroom, there needs to be an adequate amount of space to ensure students’ safety. Lisa has made the point on several occasions that “space is probably another factor which deters teachers from doing DPA in the class”. Moreover, Lisa mentioned that “depending on how much space you have in the classroom and number of students, you need to be mindful of student safety.” For student care as well as liability, anything taught or required of students should be designed in the best interest of the student, more importantly planned with safety in mind.

In Alyssa’s situation, having a library as her home room, space was less of a concern, and therefore she was able to better utilize the space safely for DPA. Alyssa also mentioned that cross-curricular DPA was done in “the library, hall or out of doors”. In Alyssa’s situation, space was not as big of a concern given having a Library as a home room, therefore she was able to make use of that space. When asked what barriers other teachers may have for not performing DPA in the classroom, “space” was one as well as “inclement weather and the mess and fuss attendant on that”. Though Alyssa was fortunate enough to have sufficient space, she made it clear that other teachers were not as fortunate and so performing DPA practices for them may not have been as feasible in the classroom. Furthermore, if the weather was not favourable, outdoor DPA may not have been an option.

Maeda and Murta (2004) have elucidated that schools are an ideal place to provide and instil healthy habits. Space is certainly a barrier for certain educators given their classroom layout and the number of students in that given space. This warrants concern for student safety. However, in such situations, Lisa suggested that alternatives could be arranged, such as utilizing outdoor space, arranging gymnasium time, or rearranging the classroom layout to suit given DPA needs.
4.3.4 Low Teacher Efficacy Towards Implementing Quality DPA

When accounting for space, time, and the quality of physical activity practices, often these factors may have educators feeling incapable or inexperienced in providing students quality DPA. Dwyer et al., (2003) point out that educators feel as though they lack the expertise to provide effective daily physical activity instructions, and express the need for educational specialists to provide such services to students. Educators typically have one strong teachable subject, and general knowledge regarding other subject content. As such, teachers who do not have a physical education background typically feel unsure and therefore uneasy in providing physical education classes or DPA for that matter. Efforts are made, however the quality of instruction usually lacks depth. Dwyer et al., (2003) found that students were not fully participating in physical activity due to low teacher efficacy and ineffective physical literacy instruction. As a result students are not meeting Ontario recommended physical activity levels.

In the interview process, when asked about teacher efficacy and the frequency of DPA performed by other teachers, Lisa said that “I haven’t seen many classes do DPA. I’ve seen a few teachers take their students outside to play”, also that “I feel DPA in school isn’t done as much as it needs to be”. More specific to classroom cross-curricular DPA, Lisa said that “it’s not all that prevalent to see teachers do DPA in the classroom”, and there is “nothing structured or related to any kind of curricular material”. The inexperience most commonly seen amongst educators may also contribute to them shying away from provide structured DPA. On that note, Lisa stated that “I don’t know how many teachers would really care to think of ways to integrate lesson plans if they themselves do not have much physical literacy skills”. For educators lacking experience in DPA lesson planning, as Lisa noted, they too often “allow their students to go
outside and play freely. Unfortunately, unstructured playtime rarely engages all students in physical activity.

### 4.4 Conclusion

In summary, despite the argued barriers against providing students the opportunity for DPA which include the lack of time, space, subject hierarchy or priority, teacher efficacy and the lack of resources for cross-curricular resources, educators should look beyond current pedagogical practices and adopt practices which proposed by participants of this study and supported in the literature. This chapter demonstrates that despite the challenges, DPAs can be effectively integrated into a variety of subject areas and benefit both student development and academic achievement. As discussed through the semi-structured interviews, DPA is seen to be rather scarce, however, very practical and feasible in achieving preferred student behaviour, student participation and engagement with curricular content, whilst building on class cohesion and peer interaction. As Taras (2005) alluded to, exercise elicits social benefits as well as improves classroom dynamics which build on creating a safe space, cooperative learning, students feeling connected to peers and school community. These attributes foster a higher state of learning while enriching the learning experience. The next chapter will discuss and elaborate on this studies findings, furthermore provide limitations and future directions regarding cross-curricular DPA in the educational community.
CHAPTER 5: Discussion

5.0 Introduction

This qualitative research study was designed to learn more about the effectiveness of cross-curricular daily physical activity (DPA) and methods implemented by practicing educators. The findings were consistent with the literature which address current DPA strategies employed by practicing educators and perceived benefits observed by participants. Additionally, participants identified barriers which make it harder to implement DPA in the classroom. The purpose of researching this topic was to shed light on how experienced educators were implementing DPA in their classroom, speak to the benefits they observed by doing so, identify barriers to DPA in the course of implementing DPA routinely.

This chapter provides an overview of key findings derived from the semi-structured interviews conducted in the fall and winter of 2015, as well as discuss the significance of the data collected. In order to assert a clear understanding and relevance of implementing cross-curricular DPA in the classroom, I will discuss the implications of implementing cross-curricular DPA in the classroom for practicing educators as well as beginning educators. I will then provide recommendations for practicing educators, beginning educators, administrators, stakeholders of education and parents. Finally, I will suggest future areas of research. This chapter will conclude with a summary of implications regarding daily physical activity.
5.1 Overview of key findings and their significance

An analysis of interviews conducted with two experienced educators revealed the following three themes: (1) cross-curricular DPA practices, (2) perceived benefits of DPA observed by educators, (3) barriers to cross-curricular DPA. The first theme speaks to the connections participants made with various subject content, strategies to use space efficiently, technologies utilized to aid in implementing DPA, as well as suggestions participants felt may increase the prevalence of DPA in schools. Theme two is grounded in the perceived benefits observed by educators regarding DPA which include the mitigating effects on anxiety and stress, as well as enhanced collaboration and inclusivity as a result of physical activity implementation. The third theme discusses barriers which may prevent educators from providing effective DPA or DPA in general. The barriers most commonly found related to a lack of time, a priority on traditional subject content, space in the classroom and limited teacher efficacy relating to DPA practices. The challenges identified in this research are important to note since students are not meeting the daily requirement of 30-60 minutes of moderate to vigorous physical activity as enormous pressures are placed on administrators and educators to dedicating more time on traditional subject content (Fedewa & Ahn, 2011; Maeda & Murata, 2004). The importance of overcoming these barriers is especially important when one considers that more time dedicated to core subject content has not improved academic achievement (Berg, 2010). The many benefits identified by the participants in this study suggest that this is an area worthy of further research. As such this research study looks to provide information on the benefits of providing students government mandated daily physical activity through effective and feasible pedagogy.
5.1.1 Overview of Cross Curricular Practices

Cross curricular DPA provides the opportunity for physical activity with a curricular learning focus. Being able to integrate a learning goal with physical activity allows students to improve on their physical literacy whilst improving and strengthening their cognitive capacity; all the while saving precious time during the school day which educators strive to manage effectively. Strampel et al., (2014) found that educators avoid DPA practices as a result of a lack of time, space and resources. The participants of this study, Alyssa and Lisa, both agree that the aforementioned challenges are manageable given appropriate time management, resourcefulness and willingness to attempt DPA practices. Alyssa and Lisa have demonstrated the ability to integrate physical activity with subjects including math, literature, music, geography, social studies and French. Participants highlighted that incorporating DPA with subject content was a great strategy to introduce a topic or overarching theme, gain student interest while keeping to DPA standards and curricular expectations. When implementing DPA in the classroom, both participants made it clear that space can sometimes be an issue depending on what that activity entails. Given that student safety is priority under any circumstance, educators need to plan for how much space they require, and plan to either do activities outside or in the gym if possible. Research suggested that educators expressed a lack of training or physical literacy as well as resources in order to provide effective DPA practices (Dwyer et al., 2003). Participants also acknowledged that colleagues in the school shared the same concerns. Both participants identified a few strategies as well as the use of technology to aid in planning effective cross-curricular DPA. One general strategy was to use available technology to support DPA. For instance, participants suggested using iPhone (for apps or music), Youtube, Google or web-based sites that provide activity-based instructions. Collaboration was also emphasized as an important
overall strategy to support DPA. Specifically participants underscored the importance of collaboration with physical educators and colleagues in order to develop creative activity based lessons while enhancing efficacy towards cross-curricular DPA. Additional advice voiced by participants was the need to create time blocks in the school day to assist educators who need a structured schedule to implement DPA, providing seminars or partnering up with colleagues who are more comfortable in providing DPA instruction.

5.1.2 Perceived Benefits of DPA by Educators

Both participants voiced common observed benefits when providing students DPA in the classroom. Alyssa and Lisa noticed that when students are given structured physical activities, they become more alert, more attentive, more engaged and participate to a greater degree compared to typical classroom lessons. Students interact more with peers, which leads to a more cohesive and collaborative classroom environment. Participants also observed that because students were given opportunities to dissipate built up energy, they seemed less stressed and less anxious compared to previously observed situations when dealing with challenging content. Moreover, students were willing to take risks and attempt problems more concretely which may have been as a result of a more inclusive classroom setting due to DPA activities which encouraged students to interact through fun engaging activities. Taras (2005) confirms the notion that daily physical activity in the classroom does in fact foster a positive classroom community as children learn to work cooperatively, feel safe and create stronger ties to their school community. Students’ concentration, attentiveness and alleviated symptoms of fatigue and depression have also been correlated to physical activity as suggested by Cotman and Egesser-
Cesar (2002). These findings align with observed behaviour of students who were exposed to DPA by the participants of this study.

5.1.3 Barriers to Cross-Curricular DPA

As alluded to through research, barriers continue to pervade educators’ misconceptions pertaining to the ineffectiveness and needlessness to endorse and provide student’s exposure to DPA within the school day. As a consequence of limited time allotted to teaching, an educator’s obligation shifts focus to improving students’ academic performance in traditional subject content like math and literacy at the expense of lower status subject content like physical activity and educations (Maeda & McKenzie, 2004). Alyssa and Lisa have confirmed that pressures from administrators are common as a result of the need to push for academic performance. Participants have expressed the concern that space can sometimes be an obstacle for desired DPA activities, however being able to plan ahead had always provided opportunity to combat these challenges. Both Alyssa and Lisa have spoken to their experience in observing a lack of DPA in their respective school community, suggesting that poor time management and or poor teacher efficacy relating to this style of pedagogy may contribute to ineffective DPA or the absence there of. Despite these barriers, participants have countered with measures educators could resort to in order build their comfort and efficacy towards instructing cross-curricular DPA.
5.2 Implications of Implementing DPA

The present study elicits important implications for educational pedagogy. In broad strokes, this study serves to remind educators and administrators the importance of physical activity as well as associated benefits; both for personal and academic development. These findings are important to consider given that physical activity reduces health risks associated with obesity, and overweight status (Fedewa & Ahn, 2011). Moreover, it can have positive effects on cognitive and behavioural development which correlate to improved academic performance (Taras, 2005). Despite being aware of the benefits physical activity has on the body and mind, educators still feel hesitant in incorporating DPA into their practice using the argument that they lack time, instructional efficacy, resources and space; moreover feel pressure from administrators to shift focus more on traditional subject content (Maeda & McKenzie, 2004; Strampel et al., 2014). The data collected from the participants of this study, along with the research which supports their field experience, serves to demystify misconceptions (e.g. the insurmountability of time constraints). In addition, the data provides novel insights which help to better understand the benefit and importance of incorporating cross-curricular DPA for administrators and educators.

5.2.1 Broad Scope: Implications for Administrators, Educators and Students

This research study suggests that the provision of cross-curricular DPA may benefit the entire educational community. Administrators and educators continually push to improve student success in core subject areas like math and literacy to the detriment of lesser status subject areas such as physical education (Maeda & McKenzie, 2004). With Ontario curriculum expectations,
administrators and educators feel an obligation to the government and parents in fulfilling academic success (Dwyer et al., 2003). Moreover, with a lack of time, resources, teacher efficacy regarding DPA and adequate space, educators continue to focus on academic driven courses (Strampel et al., 2014). However, research found that physical activity can enhance academic performance, improve student efficacy and class behaviour, increase participation and student involvement, improves attentiveness as well as concentration (Cotman & Egesser-Cesar, 2002; Taras, 2005). Increased instructional time has not proven to benefit academic performance (Berg, 2010). Whereas, academic achievement scores have improved when physical activity time increased (Sallie et al., 1999; Shephard, 1997; Lavallee, Voue, LaBarre, & Beaucage, 1994). Furthermore, Tomporowski (2008) stated that when children are exposed physical activities rich in learning contexts elicit favourable effects on cognitive processes. Therefore, providing students opportunities such as cross-curricular DPA enhances cognitive and physiological development, and elicits social benefits whilst utilizing class time efficiently. As mentioned through research and observations made by participants, cross-curricular DPA allows students the opportunity to develop social skills, enriches students’ learning capacity and learning experience, which highly benefits their overall development. The benefit for educators and administers include improved class management, opportunities for educators to diversify their teaching practice and expose students to a myriad of learning experiences; increasing student participation, intrinsic motivation, cooperation, collaboration, and fostering a positive classroom culture while potentially improving on students’ academic achievement. These research findings, which are supported by both participants, should encourage educators to employ DPA strategies into their classrooms.
5.2.2 Narrow Scope: Implications for Myself as an Educator

To date, my experience in this field was limited to physical education practices with minimal in class daily physical activity experience. As a result of my research study and knowledge acquired from both my participants, I am more aware of cross-curricular DPA practices, strategies, and benefits for students as well as educators. In my future practice, I will modify my DPA strategies to be reflective of those mentioned above, whereby I will employ strategies that provide students opportunities to learn while being active, advocate for DPA throughout my school community, and encourage educators to collaborate and build their repertoire of DPA pedagogy. From experience, I always believed that physical activity had positive effects on learning, behaviour, as well as physiological benefits which improve one’s health. This research study reaffirms those beliefs which is why I feel more confident about incorporating DPA practices into my pedagogy as part of my holistic approach to teaching. As a researcher, I found that through investigating innovative or current research, I can learn, reflect and apply relevant or creative pedagogy to my own as to enrich my style of teaching. Such practices benefit my personal development and pedagogy, but more importantly carries over to enhance the learning of my future students.

5.3 Recommendations

Based on the implications gathered from this research I provide recommendations which may aid educators and administrators in being better attuned and receptive to implementing cross-curricular strategies. These recommendations are outlined below:

1) Scheduling designed time blocks within the school day
2) Preparing effective cross-curricular DPA for pre-service and in-service educators

3) Collaboration with physical education specialists to build a DPA repertoire of lessons

The aforementioned recommendations serve to benefit the educational community in finding solutions to better employ and instruct cross-curricular practices.

5.3.1 Scheduling Designed Time Blocks within the School Day

The first recommendation targets educators, administrators and policy makers to ensure DPA practices are upheld as per Ontario mandated expectations regarding the required 20 minutes of DPA in the classroom (Ontario, 2005; Patton & McDougall, 2009; Ramanathan et al., 2008). As alluded to by Strampel et al., (2014) as well as both participants in this study, time is a scarce commodity and as such selectively prioritized by educators, most often in favour of traditional subject content areas. Policy makers or curriculum planners should consider the idea of creating scheduled time blocks within the school day which allows educators time to properly implement DPA consistently. Should policy makers not be able to accommodate such requests board wide, Administrators within each school should consider designing a schedule which best fits their educational agenda. At the educator level, if implemented time blocks are not feasible, educators could potentially time manage effectively and create their own schedule that suits their teaching and planning.

5.3.2 Educating Effective Cross-Curricular DPA for Pre-Service and In-Service Educators

The second recommendation targets educators who would be responsible in incorporating DPA in their classroom. Strampel et al., (2014) also expressed one reason which deters educators
from providing students DPA practices as a result of a lack of efficacy pertaining to their physical literacy. Alyssa and Lisa have also mentioned this being a concern amongst colleagues in their respective school community which resulted in the absence of DPA, or DPA being substituted with a “just go outside and play” mentality. Despite knowing the benefits of physical activity, teachers still feel hesitant in incorporating DPA (Maeda & McKenzie, 2004). For this reason, providing both pre-service and in-service effective cross-curricular education experience may alleviate practicing educators’ sense of inability by provide quality DPA instruction. As educators become familiar with a myriad of DPA pedagogy exemplars, their sense of efficacy in this area can improve as will their practice.

5.3.3 Collaboration with physical education specialists to build a DPA repertoire of lessons

The third recommendation follows with the previous in that building on teacher efficacy may come from collaborating with physical education specialists who are more in-tune with DPA practices. By collaborating and building a repertoire of DPA lesson plans, educators may become more adept and comfortable with DPA practices. Collaborating with physical educators may also extend to having such specialists perform cross-curricular DPA as substitute teachers in place of the homeroom teacher. Separate from the physical education program, physical educators may be outsourced to other classrooms within appropriate time blocks to accommodate or aid in DPA practices in standard classrooms.
5.4 Areas for Further Research

Inasmuch as the present study was able to elaborate on current research and highlight practical experience voiced by both participants, the study has underlined the need for further study. In future research endeavors, it may be beneficial to identify how many educators actually implement Ontario’s mandated 20 minutes of DPA requirement. As observed by both participants, there were several colleagues they found to have omitted implementing DPA into their practice. Further, it may be helpful to hone in on how often DPA is omitted in order to better implement strategies or policies that enforce the 2005 Ontario DPA policy. Also, it would be interesting to research school infrastructures and identify possibilities to better utilize space effectively. When performing DPA, safety should always be the highest priority to ensure appropriate and safe use of space. Therefore it may be valuable to identify most effective solutions that yield accommodating and effective use of space.

5.5 Concluding Comments

The present qualitative study is important because it highlights key findings which support the notion that cross-curricular DPA may enhance students’ academic achievement while having positive effects on their social, psychological and physiological states. The study investigated cross-curricular strategies employed by practicing educators and highlights the benefits and challenges of implementing DPA’s observed as a result. Enormous pressures have been placed on educators leaving them accountable for improving students’ achievement to the detriment of physical activity time which may negatively affect one’s health (Maeda & Murata, 2004). Because school have been identified as an ideal places to instill healthy habits for
students, implementing cross-curricular DPA during class time may be important to enriching students’ learning experience whilst yielding a positive and holistic effect on individual development. This research is important because currently a fair amount of educators are shying away from providing their students Ontario DPA requirements essential for optimal growth and development. By shedding light on the research and investigating current DPA practices, this research study highlighted some of the benefits of DPA as well as effective strategies employed by the participants of this study. It also makes several recommendations aimed at supporting effective DPA incorporation into teachers’ practices. This study underscores the importance of implementing DPA in the classroom. The strategies and challenges highlighted by the participants of this study alert us to what we may yet achieve in our practice as educators. By incorporating DPA’s into our practice as teachers, we can better support the academic success and well-being of all of our students.
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http://search.proquest.com.myaccess.library.utoronto.ca/docview/218497589?accountid=14771


Appendix A – Consent Letter

Date: ___________________

My Name is Martin Wysocki and I am a student in the Master of Teaching program at the Ontario Institute for Studies in Education at the University of Toronto (OISE/UT). A component of this degree program involves conducting a small-scale qualitative research study. My research will focus on how teachers integrate daily physical activity (DPA) through a cross-curricular approach. I am interested in interviewing teachers who have at least five years of experience in this field of study. I think that your knowledge and experience will provide insights into this topic.

Your participation in this research will involve one 45-60 minute interview, which will be transcribed and audio-recorded. I would be grateful if you would allow me to interview you at a place and time convenient for you, outside of school time. The contents of this interview will be used for my research project, which will include a final paper, as well as informal presentations to my classmates and/or potentially at a research conference or publication. You will be assigned a pseudonym to maintain your anonymity and I will not use your name or any other content that might identify you in my written work, oral presentations, or publications. This information will remain confidential. This data will be stored on my password-protected computer and the only people who will have access to the research data will be my course instructor. You are free to change your mind about your participation at any time, and to withdraw even after you have
consented to participate. You may also choose to decline to answer any specific question. I will
destroy the audio recording after the paper has been presented and/or published, which may take
up to a maximum of five years after the data has been collected. There are no known risks or
benefits to participation, and I will share with you a copy of the transcript to ensure accuracy.

Please sign this consent form, if you agree to be interviewed. The second copy is for your
records. I am very grateful for your participation.

Sincerely,

Martin Wysocki

martin.wysocki@mail.utoronto.ca
Appendix B – Consent Form

Course Instructor’s Name: _________________________

Contact Info: ________________________________

Consent Form

I acknowledge that the topic of this interview has been explained to me and that any questions that I have asked have been answered to my satisfaction. I understand that I can withdraw from this research study at any time without penalty.

I have read the letter provided to me by Martin Wysocki and agree to participate in an interview for the purposes described. I agree to have the interview audio-recorded.

Signature: __________________________________________

Name: (printed) ______________________________________

Date: ____________________________________________
Appendix C – Interview Protocol

I would like to take this opportunity in thanking you for participating in my study. The aim of my study is to better understand the strategies implemented regarding integrating DPA with the curriculum by practicing professionals, and to better understand the barriers teachers experience and perceptions relating to integrating cross-curricular DPA. The interview should take anywhere from 45 minutes to an hour. During this time, I will ask a series of questions pertaining to my research focus, I would like to remind you that if you do not feel comfortable answering any question, you may exercise that right. Do you have any questions before we begin?

Participant Background Bio

1. Can you please tell me a bit about your teaching experience:
   a. What grades and courses do you teach? Which have you previously taught?
   b. How long have you been teaching?
   c. Where have taught if different than your current school.
   d. Where do you currently teach? Can you tell me more about the school you currently work in? (e.g. size, demographics, program priorities)
   e. What is the school culture as it relates to doing DPA and integrating DPA with the curriculum? Do you have a whole school approach? To the best of your knowledge, do colleagues perform similar practices?
   f. To the best of your knowledge, are other forms of DPA being done in the school? If so, what grade levels?
2. As you know, I am interested in how teachers integrate DPA as cross-curricular practice. Can you tell me more about what experiences contributed to developing your interest, commitment, and confidence in this area? *probe re: personal, professional, educational

Beliefs about DPA

3. In your view, what is the value of daily physical activity for students? What are the benefits?

4. What do you believe are some key characteristics of a cross-curricular approach to DPA?
   a. What does “cross-curricular approach to DPA integration” mean to you?
   b. Why do you believe it is important to approach DPA through a cross-curricular approach? What are the benefits on integrating DPA across the curriculum?
   c. What reason or barriers do you feel a teacher may have for not adopting a cross-curricular approach to DPA integration?

5. In your experience, to what extent do you believe that the DPA requirement is being implemented in schools?

6. What do you think are reasons why some teachers do not implement the requirement?
   What do you believe would help support them to do so?

7. In your experience, how do students respond to DPA? What outcomes have you observed from them?

Practices

1. How often do you integrate DPA per week, and for how long per session in a day?

2. What type of DPA exercises or activities do you do and why?
3. In what subject areas do you most commonly integrate DPA and why? Which subjects do you find challenging to incorporate DPA?

4. Can you please give me some examples of how you have integrated DPA into a range of subject areas?

5. If you can now choose one example, I would love to hear more specifically how you designed the lesson and how your students responded:
   a. What grade/subject were you teaching?
   b. What were the learning goals and how did DPA integration contribute to your students being able to meet them?
   c. What DPA activity did you do with them, and how did it connect to the curriculum?
   d. What outcomes did you observe from your students? How, if at all, did DPA factor into your assessment of student learning?
   e. What resources did you draw on in this lesson?

6. What resources do you typically draw on to support you in your DPA integration practice? (books, manipulatives, equipment, videos, music, podcasts etc.)

7. Do you find that the resources you need are available? If there is a lack of resources, what strategies do you use in order to nevertheless perform the various forms of DPA activities?

8. Where do you typically do DPA with students? Do you have designated space, and or how do you manage to utilize the space in the classroom given to you?
Challenges and Next Steps

1. What challenges do you encounter with this work? How do you respond to these challenges? How might the education system and its various stakeholders further support you in meeting these challenges?

2. What advice, if any, do you have for beginning teachers who are committed to integrating DPA through a cross-curricular approach?

3. What advice, if any, do you have for in-service teachers who are unsure how to implement DPA through a cross-curricular approach?

Thank you for your time and participation.