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CLASSROOM MOVEMENT ACTIVITIES FOR K-12 TEACHERS
TARGETING IMPROVED STUDENT PERFORMANCE

by

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A capstone project submitted in partial fulfillment of the requirements for the degree of

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CHAPTER ONE

Introduction

This capstone project explores the situations many teachers and students experience, too much electronic device time and not enough physical fitness time. Excessive screen-time with video games and the internet, poor diets, and progressively more sedentary lifestyles have all contributed to students' struggles with weight and physical condition (Nelson & Gordon-Larsen, 2006). Movement activities have shown to increase students' alertness and memory (Donnelly et al., 2016). Yet, Physical Education programming continues to suffer cuts from student schedules. (Corbin, 2012; Fedewa & Ahn, 2011). Research suggests that teachers need curricular tools that integrate movement with their classroom experience (Racette, Cade, & Beckmann, 2010).

This project explores how the body-mind connections are being harnessed for better academic performance, improved self-esteem, and greater overall health. It investigates how movement activities are being incorporated into classrooms and suggests tools that can be used with K-12 curricula. This Capstone asks, *Can teachers use part of their teaching time in movement activities to improve individual student performance?*

Project Prompt

We are facing student populations who spend less time in physical activity than previous generations with the proliferation of screen-time combined with our less active lifestyles and cuts to Physical Education requirements (Corbin, 2012). When I was a kid, there were five or six television stations, public television and the major networks. Video games had just become widely available but were designed with limited complexity. It would not take too long before sitting with these activities, before they became boring and unchallenging so we would go outside and play. Today there are countless televised media on the actual television-set as well as voluminous video offerings between big-media production and society-wide YouTube videos. The variety of platforms and diversity of themes in the video game industry have proliferated with viral, fungal, and cancerous natures and growth. Kids of all ages can end up spending many hours in a single day sitting on these sedentary activities (Bornstein & Pate, 2014).

Our culture has shifted with these influences towards a more sedentary lifestyle resulting in rising rates of obesity and diabetes (Ahmed et al., 2017). These situations encumber our school systems and health care systems in multitudinous and ever more revealing ways all the time. “Video Gaming Disorder” has recently been inducted into the myriad of ailments being recognized in our hyper-diagnostic culture of body/mind conditions. Research has found that reducing screen time may play a role in promoting physical activity in children (Block & Russell, 2012).

As educators we struggle to create learning experiences that will engage and endure with our students. We have been in competition with the likes of Steven Spielberg

for a long time and now face abominable and formidable adversaries such as Sony, Nintendo and Netflix.

My interest in this topic wells up from how we fulfill our roles and responsibilities as educators creating the best learning experience we can with the time we have with our students. These programs vary widely from public to private, alternative to outdoor, Montessori to home-schooling. With this project, I will create a toolkit containing movement activities teachers can use to enhance the classroom experience and improve learning across the spectrum of educational environments. With this project I hope to learn how programs have formed around these ideas and how individual teachers have successfully implemented these active teaching and learning experiences.

Project Rationale

Our nation, and in fact, the world, is facing rising rates of obesity and diabetes. Kids with weight issues generally struggle with building a positive self-esteem. These factors combine into a downward spiraling cycle of weight-gain and social withdrawal (Tremblay, Colley, Saunders, Healy, & Owen, 2010). Poor academic performance and negative social experiences are often the byproducts of these conditions that make up the perfect storm of depression and despondence. Fitness routines can interrupt these cause-and-effect situations, but the implementation of sports and fitness into the diverse lives of students is an enormous challenge for school systems and individual teachers (Corbin & McKenzie, 2008).

Schools face budget pressures that make facilities, equipment and staffing difficult elements to orchestrate into the rest of the school day. Especially considering the pressures of the testocracy that make it difficult for teachers to get “outside the box” of lessons not directly related to what they know will be found in the standardized tests their students will face (Corbin, 2012). Many small and alternative school programs are housed in buildings with minimal or no space for indoor and/or outdoor physical activity. Teachers need ways to incorporate movement into the classroom experience. Students learn better when they are alert and calm. Movement can help get the monkeys out and the focus in (Fedewa & Ahn, 2011; Smith & Lounsbery, 2009).

The context of this study is a result of my own personal and professional development from my experience as a student, and then a teacher, and subsequently as a program developer. I also draw from my experience as a coach of young athletes. Jack Lalaane and Richard Simmons were among the first public figures to stress physical fitness as an underpinning of a healthy life. As a young kid without physical fitness, I found these media figures to have a message unfamiliar to my experience. It took participation in athletics for me to recognize the values to my physical condition, social experience and overall health.

Many programs simply lack the infrastructure to support physical education and activity. Most of the alternative school programs I worked for in Minneapolis were housed in small buildings without the physical space for physical education. Programs and teachers improvise and innovate in order to accomplish some measure of physical activity. For example, we would take our students on walks around the block as part of an

active lesson plan but there were always potential adverse elements. Kids need shoes proper for walking, a jacket proper for rain or cold, and socks can often be an issue for kids without clothes-security. Sometimes there were threats to safety from gang activity just walking outside. Implementing programming for physical education and activity can be an enormous challenge for teachers in many school systems (Corbin & Mckenzie, 2008).

Project Scope

My observations and the sources cited above suggest the light at the end of the tunnel looks something like getting students more alert, with better concentration and reading abilities. My burning question is: *Can teachers use part of their teaching time in movement activities to improve individual student performance?*

In Chapter Two of this study, I explore what is being done to answer this question. The literature review includes a diagram of issues from obesity and self-esteem to video gaming and depression. This diagram composes a picture of overall health. This study will focus on the factors surrounding the need to support more physical movement activities for students targeted specifically at learning capacities which will improve individual student performance.

Chapter Three consists of a project description of classroom movement activities for teachers to use to improve student performance. The other aspects in Chapter Three are the theoretical frameworks supporting the movement activities, timelines, settings and audiences, and potential contributions to public scholarship. Chapter Four will reflect on the process of developing classroom movement activities for teachers.

CHAPTER TWO

Literature Review

Chapter Two first describes the purpose and scope of this project with an examination of contemporary students and the effects of sedentary behaviors. The following sections discuss how physical activity impacts the learning process including the biochemical effects. The final sections contain some historical perspectives on Physical Education, some of the mixed results in the existing research, and finally a look at the gaps in existing research. With this information, I begin to answer the question:

Can teachers use part of their teaching time in movement activities to improve individual student performance?

Purpose & Scope

The purpose of this project is to explore movement activities and their impact on the learning process. After examining the research regarding how students spend most of their time outside of class, this literature review will examine how physical activity has been found to impact learning outcomes. The project, which is described in the following chapter, is the creation of a toolkit for teachers containing a series of specific movement

activities for use in their classrooms targeted at specific learning capacities. The scope of this project is looking at lifestyle on a continuum in the lives of our students from kindergarten through high-school. While the toolkit is intended for use with students, adults may benefit in all the same ways from incorporating these movement activities into their classrooms (Castelli & Ward, 2012). This project will seek to discover how teachers can incorporate a variety of movement and stretching activities to engage students deeper into the learning process in targeted ways.

Contemporary Students

Looking at the student, we find kids who sit too much and walk too little. Compared with students of 30 years ago, kids are 40% less active today. Only 42% of U.S. students get the recommended 60 minutes of daily moderate physical activity (Konijnenberg & Fredriksen, 2018). We are facing a generation of young people whose time spent in sedentary activity is spiking and physical activity is diminishing. The nature of that sedentary time is also changing with the market saturation of the smartphone in 2012 and the concurrent rise of the social media (Twenge, Joiner, Rogers, & Martin, 2018). We have barely begun to surmise the impact of so much digitally connected time and communication on the emotional framework of children. There is data to show that the emotional framework of young people is developing differently with increased digital interactions compared with historical in-person, face-to-face association (Twenge et al., 2018).

Sedentary Behaviors

One of the more substantial research efforts began with an examination of 232 studies involving 983,840 participants over a 51-year period originating from 39 different countries. (Tremblay et al., 2010). In this in-depth look at sedentary behavior in children and youth, the researchers pointed at a dearth of research specific to sedentary time amongst young people, citing 14 out of the 232 that focussed specifically on sedentary activity in student populations (Tremblay et al., 2010).

While there were some conflicting results among that preponderance of research, Tremblay et al. (2010) found that sedentary behavior was associated with unfavorable body composition, decreased fitness, lower scores for self-esteem and pro-social behavior as well as decreased academic achievement in children 5 to 17 years among “all study designs, across all countries, using both direct and indirect measurements, and regardless of participant sample size” (p. 14). Sedentary behavior has become an issue critical enough for the World Health Organization to assemble studies, and the research community has implemented new nomenclature, sedentary physiology as opposed to exercise physiology (Tremblay et al., 2010). The authors concluded the resultant issues of unfavorable body composition, decreased fitness, lower self-esteem and less social inclination are all results of students’ increased screen time.

Sedentary behavior poses serious threats to students’ health. Television viewing is identified as the majority of sedentary time measured by researchers, then trending towards internet and smartphone use as children age. By 2013 about half of Americans were using smartphones, and by 2015 92% of teens were as well (Twenge et al., 2018).

Evidence has shown that “sedentary behavior has a direct influence on metabolism, bone mineral count, and vascular health” (Tremblay et al., 2010, p. 729). This phenomenon of sedentary behavior exists on a scale far greater than when this researcher was a child in the 1970’s. Tremblay et al. cited a Zimmerman et al. 2007 study that found children in 1971 began watching television at an average age of four years old. Tremblay et al. went on to cite a Christakis et al. 2004 study that found 90% of children began watching television at two years old. Yet another study, Zimmerman and Christakis (2005) found that television viewing before age three was associated with detrimental effects on reading comprehension and memory as well as an increase in bullying behaviors at age four (Tremblay, et al., 2010). Tremblay’s 2011 article found that from their analysis of longitudinal studies children that watched more television went on to have greater difficulties with attention in their teen years, progressed more slowly with reading, and did not perform as well on cognitive tests as those watching less than one hour of television per day (Tremblay et al., 2011). These researchers discussed the harmful effects of various forms of screen time as existing on a spectrum from despondence to depression to suicide.

Increased screen time corresponds with decreased social interactions. Twenge et al., (2018) suggested these combined factors lead to increases in mental health issues: “Adolescents low in in-person social interaction and high in social media use reported the highest levels of depressive symptoms, suggesting this group is the most in need of intervention” (p. 14). In-person social interaction has historically formed the neurological construction of our social and emotional selves. Replacing that personal interaction with

electronic communication removes the emotional closeness and threatens to destabilize the emotional system (Twenge et al., 2018). Facebook has, of course become the preeminent host of this disturbing trend. Twenge et al. cited a Tromholt, 2016 study which found increased Facebook use may lead to higher rates of bad moods in teens. Also, participants in the study found that those who gave up Facebook use for one week reported fewer depressive symptoms. After covering these disturbing trends of increased sedentary behavior and digital communications, the next section examines how physical activity affects the learning process.

Physical Activity & The Learning Process

This section of the chapter explores research regarding physical activity and its effects on learning, as well as where the voids of research exists within the area. First will be a brief discussion of how various qualities of methodologies have produced mixed results. Second is a look at the biological basis of physical activity positively affecting learning. Third is a look at some programs that have implemented physical activities into their curricula. The fourth part of this section examines some historical perspectives on Physical Education and its' diminishing role over the past decades. The fifth and final part of this section will isolate some of the gaps in the research into physical activity and the learning process.

While there are some contrary and inconclusive studies, most current and historical research reflects positive correlations between physical fitness and social, academic, psychological, physiological and emotional well-being. Kids' decisions and habits regarding fitness are formed at early ages and often succeed well into adulthood

(Hsin-Chung, 2016; Ignico, Richhart & Wayda, 1999; Ratey, 2008). Thus, this project seeks to add to the alarms sounding about the critical nature and gravity of the situation we face with so much of kids' time spent with screens containing excessive amounts of teen communication, engineered video gaming or just watching television and random YouTube videos. The downside to this situation is steep and kids can end up slipping down it quickly. It has been stated that "depressive symptoms, suicide-related outcomes, and suicide deaths among adolescents all rose during the 2010s. These increases follow a period when mental health issues were declining or stable" (Twenge et al., 2018, p. 8). Supplanting electronic media use with physical activity could be a way to combat these disturbing trends in society and education. Teaching various subjects with strategies that involve movement and physical activity could be a way to galvanize the learning process in a way that research shows to improve student performance and learning.

Mixed Research Results

Several studies considered in this literature review seemed to suffer from small sample sizes and or short periods of time under examination. Howie & Pate (2012) cited numerous works that sought clarity into the links between physical activity and positive academic and cognitive outcomes. Their findings concluded that "...many studies used weak methodology" (Howie & Pate, 2012, p. 161). Howie and Pate (2012) also touched on the subject of reporting bias. After their examination of the literature they suspected an emphasis on positive results. They reported that while the quality of research in this area has grown substantially there remains "inconsistencies in exposures and outcomes (which) make it difficult to draw strong conclusions" (Howie & Pate, 2012, p. 166). In a

more recent study, Bidzan-Bluma and Lipowska (2018) criticized the body of research referring to the few available articles, small numbers of participants, a lack of cultural diversity among participants, and problems with the quality of reporting. In another recent article a group of researchers took on an eight-month examination of how a “whole-of-school” transformation initiative impacted students’ overall academic performance (Centeio, Somers, Moore, Kulik, Garn, Martin, & Mccaughtry, 2018). The study by Centeio et al., (2018) is a good example of a sound methodology and execution. Taking place over a longer period of time, this study seems to be reliable in measuring the impact of fitness on learning while controlling for age, sex, and school socio-economic status. The study correlated fruit and vegetable intake with math and reading and found positive relationships between healthy school interventions, increased physical activity, and the academic success of urban students (Centeio et al., 2018, p. 414). Even with a comprehensive study such as this one, the authors recognized some of the limitations of their study that may have interfered with the clarity and precision of their derived results. One among those limitations was the analysis of physical activity only during the school-day rather than on a 24-hour period. Another criticism of their own review was the lack of accounting over the *quality* of physical education and activity being administered as parts of the program.

In another prominent study, Fedewa & Ahn (2011) offer a complex and detailed critique of the most frequently cited works in this area and the limitations that are endemic to many studies in physical activity and cognitive performance. Despite the majority of studies reflecting significant cognitive and academic benefits from physical

activity, there remains accuracy and consistency issues with the instruments of measure. For instance, in their review of existing literature, Fedewa and Ahn (2011) examined Etnier and colleagues (1997) and Sibley and Etnier (2003) studies finding several limitations. Primarily, the statistical analyses that Sibley and Etnier used in their meta-analysis were relatively simple. For instance, the authors did not apply random-effects or mixed-effects models (Raudenbush, 2009) when effect sizes showed significantly large variances (i.e., when the overall homogeneity test of ESs was statistically significant). Second, the results from Etnier et al. (1997) were not based on an accurate test statistic. Also, no further mean comparisons using post hoc tests (Hedges, 1994) were conducted in the Sibley and Etnier (2003) meta-analysis (p. 522). These limitations were found within the analytic framework of Etnier et al. Both the Fedewa & Ahn (2011) and the Etnier (2003) studies were very substantial works with high levels of scholarly bibliographies with more than fifty references. This goes to show what a difficult task it is to isolate the measurement of physical activity and consequential impacts on learning.

A smaller teacher-initiated action research project was full of insightful observations which drove thoughtful interventions and revealing results. Camahalan & Ipock (2015) saw dwindling participation over the course of the school-day. They asked what would happen when "...the classroom teacher uses instructional time to build a classroom community where exercise and movement is integral to the educational experience." (Camahalan & Ipock, 2015, p. 291). While the authors were able to make numerous observations of positive effects from "activity breaks" during their study of

math progress, the duration of their analysis was one week and the number of participants numbered only ten. They found solidly positive results with their kids diagnosed with attention-deficit and hyperactivity syndromes. As fitness routines have been shown to help these students, research shows the importance of establishing these habits at a young age. Ignico, Richhart, and Wayda (1999) refer to both the President's Council on Physical Fitness and Sport and the U.S. Department of Health and Human Services' recognition that "...exercise initiated during childhood may carry over into adulthood, and regular physical activity may improve overall levels of both physical and mental health throughout life." (p. 31) In their findings, Camahalan & Ipock (2015) showed that when students are provided with adequate activity breaks they are less fidgety and more on task. In a 2005 article published in the *Journal of School Health*, Howard Taras made clear explanations of why children may learn more effectively when academic rigors are mixed with physical activity.

Taras (2005) reviewed 14 articles since 1984 that examined the relationships between physical activity and school performance. In his background section on physical activities in academic settings he explained the biochemical basis of effects of physical activity on learning. These well-known relationships were expressed in numerous other publications under examination in this capstone such as the Bidzan-Bluma and Lipowska, 2018 study, as well as the Konijnenberg and Fredriksen article also from 2018.

Biochemical Effects of Physical Activity

The discussion so far suggests that the studies summarized above agree on the generally accepted science that physical activity improves metabolic rhythms and blood

circulation throughout the body and to the brain which raises levels of norepinephrine and endorphins which may reduce stress, improve mood, and “...induce a calming effect after exercise, and perhaps as a result improve achievement” (Taras, 2005). These are conditions favorable to learning. No matter how convoluted some of the results may be from various studies as results of diverse levels of quality in methodology, the overwhelming scientific knowledge and the growing body of research literature lead us to know that better levels of fitness will likely afford better levels of academic and social wellness (Chomitz et al., 2009; Corbin, 2012; Fedewa & Ahn, 2011; Howie & Pate, 2012; Ignico et al., 1999; Taras, 2005). Despite this knowledge, school systems have yet to successfully challenge the testocracy or win the budget battles as physical education and activity programs have seen cuts and eliminations in recent decades (Metzler, McKenzie, Van, Barrett-Williams, & Ellis, 2013).

Historical Perspectives

In his exhaustive review of advancements in fitness and activity research over the past fifty years, Charles Corbin (2012) stated in no uncertain terms, with the resonance of an old soldier:

The advent of “high stakes” academic testing associated with the “No Child Left Behind” legislation in 2004 had a considerable effect on physical activity in schools. Like Sputnik in the 1950s, high stakes testing resulted in more attention to the so-called “core courses” and led to cuts in physical education programs. This occurred in spite of research showing that fitness and activity actually promote academic achievement (Corbin, 2012, p. 7).

Almost every article that found positive results in the relationships between physical activity and academic performance talked about the need for lobbying of administrators, district school boards, and state legislatures for the overarching values of physical education to schools and society. In his McCloy Lecture, Corbin acknowledged that physical education practices from when he began his career would not be considered acceptable today. He did so in recognition of how “knowledge of the past helps us as we meet the future.” (p. 7). Corbin’s humility submits and mandates us as educators to be the lobbyists of our administrators, our districts, and our legislatures in advocacy of our students. Anyone within eye-shot of this reading or any other in this subject area places themselves among those that would find it incumbent upon themselves to at least write a letter to the editor of a local paper and a local state legislative representative. Corbin’s article expresses with methodical passion the need for innovation in our profession that is teaching. Into the headwinds of social media, video gaming, and old-fashioned television viewing drives this force that is movement activity; face-to-face and physically engaging from head to toes. In a commentary section, Corbin speaks to a crucial symptom of what he sees as an unchanging, and in fact changing in the wrong way, system of schools.

His specific criticism is of “the current era of specialization” (p. 7) in which a career in the way he was able to experience it would not be possible today. He was able to conduct research on a variety of subjects which were important to him but not necessarily or apparently related. While recognizing the benefits of having developed a deep disciplinary base in the profession of physical education, Corbin recognizes that specialization does not favor changing course, nor does it lend itself to cooperative efforts

in other areas. He speaks of physical education as potentially becoming the renaissance field of the twenty-first century (Corbin, 2012). In order to accomplish this advancement in the field of education he contends we, as educators need to be able to change course if necessary and study pressing and currently relevant topics (Corbin, 2012).

The renaissance in education is going beyond the call for what has historically been known as “physical education”. Among the emerging literature both Howie and Pate, (2012) and Ignico, Richhart, and Wayda, (1999) speak to a gap in the research that is a call for specifics beyond recommendations of “physical activity” that entail “dosage and type” and “frequency”.

Program Implementation Results

Higher cognitive functioning and achievement scores have been positively associated with increased time spent in physical activity for elementary and middle school-age children (Fedewa & Ahn, 2011). Those are our goals as educators: strong cognition and good scores on tests. We want our students to learn and be able to perform knowledge and mastery of information and ideas. The Centers for Disease Control and Prevention (2010) showed that fitness and activity actually promote academic achievement. Fitness and learning exist on a daily continuum that makes up lifelong health, well-being, and achievement (Ignico, Richhart & Wayda, 1999).

School programs that have embraced the mind/body connections often reference the term “embodied cognition” derived from recent evidence from neuroscience and psychology (McClelland, Pitt, & Stein, 2015). McClelland et al. claim their embodied cognition approach yielded a 20% improvement over a three-year period for students

achieving academic standards. This program was based on the idea that bodily awareness roots our systems of understanding. Specifically, this new neuroscientific and psychological evidence explains “that experience gained from learning accurate muscle control in order to achieve physical tasks allows the child to better understand how to achieve other, more abstract goals” (McClelland et al., 2015, p. 84). Based on embodied cognition, the authors sought to demonstrate how improved attention and self-control through the incorporation of physical activities, movement and auditory tasks could yield enhanced academic achievement. The authors point out that cognitive science has some advocates who contend that “all cognition is based on knowledge that comes from the body” (McClelland et al., 2015, p. 85). This article was one of very few that deals directly with dose and type; the majority of attention has been paid to the dose and type of physical activity as well as the consequent type of effect. For example, Mcllelland et al. (2015) found that short bursts of activity can benefit concentration levels. They found that children’s phonological awareness and reading may improve with rhythmic exercises. Reading comprehension improved throughout their program. Practices of mindfulness and relaxation also positively influenced academic outcomes (p. 86). One of the strongest achievements in the results of the program was a three-fold improvement for kids achieving their targets in KS2 SAT tests.

The movement activities developed in this capstone project grow from the theoretical frameworks established in this Mcllelland et al. (2015) article. Connecting movement activities to the various academic subjects is part of the mentally stimulative process of physical education and has taken on the nomenclature of “interdisciplinary

education”. The teacher’s toolkit created within this capstone project demonstrates how to engage interdisciplinary teaching ideas together with the movement activities. For example, there are mathematical and geometric concepts in the angles generated while bending at the knee. A variety of foreign language vocabulary could be used for body parts. There are also identified biological and chemical processes as we exert our muscles, especially for any period of time. There is vocabulary in the actions and feelings of joints and muscles and so on. Interdisciplinary teaching and learning tap on the capacities of our imaginations to make more connections between subjects and areas of knowledge. The movement activities developed in this capstone project give teachers opportunities to connect ideas and information from their subject with movement activity. The term interdisciplinary can be simply defined as the involvement of two or more subjects or areas, usually academic. The description of interdisciplinary learning is “a knowledge view and curriculum approach that consciously applies methodology and language from more than one discipline to examine a central theme, issue, problem, topic, or experience” (Kaittani, Kouli, Derri & Kioumourtzoglou, 2017, p. 95). The authors talk about this learning paradigm as helping learners recognize their own learning styles, thus accelerating the learning process. Their contention is that through this learning process young people develop connections between school and life (p. 96). That is ultimately our goal as educators, to help our students get along in life. In whatever subject we teach, we hope to help them gain lifelong skills as they go from our classrooms. Programs that integrated more comprehensive physical education into their curricula have shown positive results. One of the most substantial studies to demonstrate

those positive correlations between physical activity and academic performance was the Chomitz et al., 2009 study.

Chomitz et al., (2009) showed that passing scores in both Mathematics and English increased with the number of fitness tests students passed. This study had a large number of students and there was a wide diversity in the student population. The final analytic was made up of 1841 fourth through eighth grade students. The study found 38% and 24% increased odds of passing math and reading tests, respectively, with each unit of fitness tests passed (Chomitz et al., 2009).

Gaps in The Literature

Issues left unaddressed in the research surrounding the subjects of fitness and learning include the type, dosage and frequency of physical activity. It is easy to establish the value of physical activity and education. It is difficult to set forth fitness routines specific to optimal learning. Within the confines of existing buildings, school schedules, daily diets, and available resources, establishing combinations of physical activities appropriate to students of differing physical dispositions and desires is a very complex task. To do so in measurable ways is even more complex. It is no surprise that research studies have only begun to scrape the surface of combining specific types of fitness activities that support specific types of learning capacities.

Conclusion

Too often, our students go away from our classroom with their face in a screen. They may spend from two to six hours with electronic screens. A vast majority of research makes it abundantly clear that less screen time and more time with movement

and physical activity can only benefit students in school and in their lives. Despite mixed results from various qualities of methodology, the discussion in the previous pages indicates that there is a groundswell of evidence emerging specifying the benefits from involving movement and physical activity into school programs and curricula. Chapter three of this capstone delivers a series of movement and stretching activities specifically calibrated to achieve specific results in areas of alertness, concentration, and reading. After completing the presentation that results from Chapter three, teachers will have a toolbox full of movement and stretching activities they will be prepared to lead in their classrooms for the purposes of improving students' alertness, concentration, and reading skills.

CHAPTER THREE

Classroom Movement Activity Project

Chapter Three consists of a project description of classroom movement activities for teachers in order to improve student performance. The other aspects in Chapter Three are the theoretical frameworks supporting the movement activities, timelines, settings and audiences, and potential contributions to public scholarship.

Introduction

The research question explored in this capstone is: *how can teachers use part of their instructional time in movement activities in order to improve student performance?* Related to this question and based on the literature summary in Chapter Two, an educational toolkit has been developed for K-12 teachers with activities specific to learning process goals. This chapter consists of three sections following this introduction. First is a full description of the project, with activities targeting specific learning capacities. Second is an explanation of the curricular framework that underpins the presentation. Third is a description of the audience and settings the presentation is designed for. And finally, the last section will forecast the contribution of this project to public scholarship, summarize this third chapter and introduce the fourth and final chapter of this capstone.

Project Description

As previously mentioned, the series of movement activities for this capstone project were developed with a K-12 audience in mind, but could be adapted to all ages. The style of presentation will differ. The intensity of the movements will differ. The duration of the activities will differ. But the core movements and general progressions will remain the same and appropriate to all ages from ambulatory to geriatric.

Contents. The toolkit will consist of a series of three sets of three movement activities. Each with three different aspects of learning in mind. Teachers will be able to utilize these different movement activities targeting specific learning process goals. As discussed in Chapter Two, if five to ten minutes out of a teaching hour were spent in movement activity designed to enhance the learning capability necessary for that subject, teachers could expect a higher rate of return on the remaining time invested during that teaching hour (Racette, Cade, & Beckmann, 2010). The learning capacities targeted with specific movement activities are alertness, concentration, and reading performance.

The first movement series consists of three activities. The first activity is the entry level activity and targets alertness. It will give participants a basic foundation of balance, flexibility, and strength. It introduces the concepts of “flexion” and “center of mass”. Teachers and students will stand with their feet shoulder width apart and toes pointing forward. The teacher will seek to describe to students the location of their center of mass as somewhere between their stomach and chest, and in front of their spine. With that mental focal point, participants will concentrate on lowering and raising that center of mass directly down and up as if on a vertical string by flexing evenly at the hips, knees, and ankles. This is basically a mild squatting movement, it is executed at levels

appropriate to the age and ability of the group as determined by the presenter. According to McClelland et al., (2015) “Focussed awareness and mindfulness of physical actions may be more important than aerobic impact” (p. 18). The project presentation for this capstone include coaching for teachers to train the focus of each individual participant on their individual body mechanics, balance, motion fluidity, and mental presence in the moment.

The second activity builds on the first, and introduces balance transfer movement from side-to-side. The idea is to expand from the first movement activity with the addition of rhythmic movements from one foot to the other keeping both feet on or very near the floor. The targeted learning capacity with this movement exercise is reading. Mclelland, et al., (2015) found rhythmic exercises to improve students’ reading comprehension and phonological awareness (p. 18). It is up to individual teachers how they choose to introduce rhythm in their classrooms, whether it is up to students in their own minds or with some ambient music for the room.

The third movement activity builds on the first two and should only be introduced after students have achieved some familiarity, comfort, and efficiency with the first two activities. The third movement activity targets concentration as a learning capacity. With some confidence in their stance, balance, and movement students can approach an activity that will require a short burst of activity. Short bursts of activity have shown to improve students’ concentration (Mclelland et al., 2015). This movement activity asks participants to combine the first two activities in a motion that transfers their weight from one foot to the other and back. This is a smooth and consistent transfer keeping 100% of

their weight on one foot, focused on the center of mass directly over the one foot, with hands positioned in-front of the body for balance. The presenter will coach the mental focus of the participants on their fore-and-aft balance while noticing all of the minute balancing motions of the body at the ankles, knees, and hips which are flexed evenly.

The second series of activities are stretching movements. This series of stretches is designed similarly to the movement activities; participants are able to use variable degrees of flexion and and extension as they apply mild pressure to the stretching motions. Two different stretching formats are presented; differing classroom environments and groups of participants will help to determine which may be most appropriate. Teachers/presenters may choose from: stretches on the floor, or freestanding stretches with balance assists.

The third series of activities combines the skills, understandings, flexibility, balance, and endurance developed during the previous movement and stretching activities. This series of activities builds upon the basic flexion motion adding the balance and strength challenge of one-legged movements. They include three movements that continue to build strength and balance. Engaging the quadricep and calf muscles will quickly approach an activity level that would qualify as a “short burst” of energy targeting concentration skills on the parts of students. This series of activities include: advanced flexion, introductory stance and balance, conditioning movements in a seated position, and an interdisciplinary movement activity.

Curricular Frameworks - Adult Learning Principles

Conveying the value of movement activity time in the context of learning environments may involve some persuasion with teachers that might resist such a diversion from the academic routine. Knowles (1992) stresses two things most salient to the context of these movement activities: the importance of active participation on the parts of participants in adult learning presentations, and the need for the content to be a solution to a problem they are faced with in their experience with students. Additionally, these movement and stretching activities can be of immediate value in their personal as well as professional lives. Whether we are competitive athletes in our free time, or just like to stay fit, movement and stretching throughout the day can improve the quality of life at work if approached in mindful and strategic ways.

The preparation for presenting will address Knowles' second principle of adult learning, engaging and building "...on the backgrounds, needs, interests, problems, and concerns of the participants." This is the crux of introducing and engaging participants into the process of using movement activity to enhance learning experiences. Students with better alertness, concentration, and reading will perform better overall in school (McClelland et al., 2015). According to Koch (2013) there are benefits to the learning process from "movement breaks" throughout the school day. This strategy enables students to refocus their attention on academic concepts and to experience the neurological and physiological benefits, while unconsciously using it to their advantage in an academic setting. Students have shown better on-task behavior during academic instruction through the incorporation of physical activity breaks (p. 42). If a teacher has quality curricula and thoughtful administration and classroom management, better

on-task behavior will most likely lead to better overall performance in school and that is a goal every teacher shares with regard to their students. That is the subscription to Knowles (1992) second principle addressing the needs, interests, problems, and concerns of the presenters.

The series of movement activities included in the toolkit for this capstone project follow established principles of physical education. Most importantly, building on what students already know (Manners & Carroll, 1995). With regard to the movement activities developed in this capstone, they all derive from the basic human movement of walking, kneeling, standing tall and crouching down. The activities have been developed with K-12 students in mind. While the presentation and execution styles may differ, the core body movements remain the same.

This toolkit for teachers include guided introductions into movement activities which will engage students both physically and mentally for a purpose determined and designed by the individual teacher administering the movement activities. If a teacher is not physically disposed to demonstrate and participate in the movement activity, verbal explanation and visual response guidance will be easily adapted by those individual teachers.

Audience & Setting

The presentation developed in this capstone project is designed for up to a half-day of training and small group discussion amongst K-12 teachers. After completing the presentation, teachers can expect to have numerous movement and stretching activities with which to target specific learning capacities such as alertness,

concentration, and reading skills. Together with progressions of movement and stretching activities, teachers can expect a higher rate-of-return on the instructional time they have invested. With rehearsals among friends and/or family, teachers will gain understandings of some of the particularities in the process of guiding others in mind/body awareness and movement.

The notes provided with the presentation will provide teachers with detailed coaching for movement and stretching activities to be performed safely, and in a progression that allows for teachers and students to advance their proficiency and comfort with each individual movement and stretch. Also included are copies of recent media articles discussing the dangers of screen time, and the values of quality fitness and sleep to childhood and adolescent development and cognition. The presentation itself has photos and videos demonstrating the movement and stretching activities.

Contribution to Public Scholarship

This series of movement and stretching activities gives K-12 teachers an easy-to-use toolkit with which to respond to the abundant evidence that the body and mind are integrally connected in responsive relationship to one another (Arwari, Quirola, Perry, & Mantilla, 2014; Donnelly et al., 2016; Hillman, Buck, Themanson, Pontifex, & Castelli, 2009; Howie & Pate, 2012). With the consistent incorporation of these movement and stretching activities, teachers who embrace the mind/body connection and share that embrace with their students could reap rewards personally and professionally. Those rewards would represent results. With those results, political will, administrative

and curricular responsiveness, the breadth and depth of the research base will continue to grow and consequential institutional change may occur.

Conclusion

Ten minutes out of every learning hour could be dedicated to these and other movement activities and in a matter of time, students in the United States would be getting the recommended daily allowances of physical activity. General levels of happiness could go up. Incidents of cardiovascular and respiratory health problems could go down. The quality and durability of the learning that takes place in the classroom would go up. This could be part of the renaissance our school systems need.

The fourth chapter of my capstone project reflects on how the capstone process challenged and improved my skills as a teacher, a learner, a writer, and a researcher. It isolates the publications from my literature review that were most salient to my subject, as well as sharing the implications of this research which are beginning to saturate the news. Chapter Four concludes with considerations to the limitations unique as well as common to other areas of research in education. Future policy innovations will certainly take place in the wake of that research, as matters of time and the determination of improvement to the educational experience in our schools.

CHAPTER FOUR

Reflections and Conclusions

A Search for Meaning and Value

I began my journey at Hamline with the intention of becoming a better teacher and learner. I finish my journey at Hamline with the creation of a toolbox for teachers in order for them to more fully engage with their students during the time they have together. These tools, movement and stretching activities are calibrated based on research that shows physical activity can improve student performance. In this fourth chapter of my capstone project I will reflect on how the capstone process challenged and improved my skills as a teacher, a learner, a writer, and a researcher. I will isolate the publications from my literature review that were most salient to my subject. The implications of this research are beginning to saturate the news. While there are limitations unique as well as common to other areas of research in education, future policy innovations will certainly take place, it is just a matter of time.

Watershed moment. During the course of this capstone project, I have felt like the old guy on his porch shaking his finger at “kids these days” who sit around playing video games and chatting on their phones instead of being outside playing games and sports. While at the same time seeing articles in The New York Times and the BBC News about the highly addictive natures of screen-time and the concurrent adverse

effects. The process of this literature review made me feel as if there is about to be a watershed moment about the ways we have brought technology into the hourly experience of our students. The connections between these various digital addictions, sedentary behavior, and the associated detrimental effects are becoming more commonly evident as the research stacks up. Rather than being the old guy shaking his finger, I chose to take on this project. I am asking *how can teachers use part of their instructional time in movement activities in order to improve student performance?*

Lessons as a researcher. The capstone process has taught me some hard lessons about the institution of education, the political forces that improve and/or impair good education, and the brick wall that is incremental change. As a researcher, I have taken the beating of lessons in how difficult it is to conceive, strategize, organize, and execute a critical inquiry in a timely fashion. Research seems riddled with flaws that threaten the very findings that so much work went into gathering. For example, in the context of measuring physical fitness and education programming so many articles were constricted either by the sample size or by the duration of evaluation, the quality of the activities and/or the inclusion of out-of-school time. I am sure the scarce funding together with the pressures of teaching and publishing are at least some of the causes of this difficulty with the research base.

Lessons as a learner. As a learner, I have been no less than shocked and dismayed by the cuts to education budgets and curricula. The loss of Physical Education as a required subject area is causing such a strain on our society. Most of us are overweight to some extent and many of us are losing our sense of recreation, especially

recreating outside. The word recreate is important to consider; to re-create something that is ourselves by increasing the oxygen we breathe and making our heart beat faster...this is to recreate our bodies and minds. We have, to large extents, lost these functions to our device time.

Electronic devices have come to control huge amounts of our young people's time and we are only beginning to know the consequences. The loss of Civics Class from required curricula adds to the deficit students experience at the hands of budget and political pressures; we are failing to properly notify students about the roles and responsibilities we will expect from them as they become tax-paying workers in our economy, effectively paying for the education they just received. Writing about the connections between excessive screen-time, sedentary behaviors, and their combined effects on the costs to our social, political, and physical well-being could constitute some future focus for me.

Lessons as a writer. As a writer, I have been made to remember how much writing is just like any other practice. It is no different from physical fitness, musical performance, or any other discipline that requires daily practice. You may not forget how to ride a bike, but you can't ride very far or in difficult terrain if you haven't been riding your bicycle regularly. Writing is a discipline which requires strength, flexibility, balance and focus just as any other. Technically, as a writer I have also refined my skill of extracting my voice from my work, it has been hard won.

I have also been made to remember how much I like writing and how it makes everyday feel more real for the words that lay on a page at the end of the day. Throughout

this capstone project I was made to remember a professor I had in college who said something to the effect that it is of no consequence until it is written down. I like that; it is a call to action. In as much as research is a call to action, there were two articles that drove the answers to my research question the most, Tremblay, et al., and Mclelland, et al.

Influential literature. Tremblay's study revealed the myriad of difficulties we face as results of sedentary behaviors largely resultant from too much screen-time. Mclelland's article began to address one of the voids in the literature, what physical activity helps what specific learning capacity. The implications of this mounting evidence cannot go without chipping away at the brick wall of incremental change in how our students experience institutional education. Additionally, Corbin's article served as a comprehensive historical perspective on how Physical Education has evolved and suffered in recent decades.

Implications. It is difficult to expect any real change in the face of this research, considering it was almost twenty years ago that former Secretary of State, Condoleezza Rice first talked about our high-school students' physical and mental fitness being inadequate for the workforce and/or the military. Corbin's article also served as a call-to-action for advocacy of Physical Education. The implications for this research must strengthen, broaden, and rise in volume for the political and budgetary ramifications to take effect. If politics and budgets aren't enough headwinds, the attitudes of and time pressures on teachers are limitations in the face of trying to be more active during the school day.

As teachers, we all feel that our subject is really important if not most important is some ways and we don't want to sacrifice one minute of instructional time we have with our students. There is so much to cover in most curricula and teachers have to be miserly with how teaching time is spent. The idea that ten out of fifty minutes may make the other forty minutes more valuable is a hefty wager to make. It is the contention of this graduate student that if they make that wager, they will reap rewards beyond what they may have expected or hoped for. As a ski racing coach I am made to challenge my own conceptions that may limit the growth and development of my kids simply because I don't think they could or would do something, or that it would benefit their skills. I am often made to be wrong in that situation.

Future research. Future related research for myself and/or others is quickly becoming alarmingly clear. The preponderance of screen-time on the parts of young people today is having profoundly deleterious effects on brain and social development that are only beginning to reach the conversations from the ranks of educators up through administrators and to policy makers. My content expert who works as a Physical Education and Math teacher in Missoula, Montana reacted to some points in my writing which reflected students today without the ability to look you in the eye when talking, especially under any sort of criticism. Digital texting and messaging is replacing our ability to interact personally. Future research has to connect these dots between screen-time, sedentary behaviors, and a digitized socialization. It seems to be messing up our brains; impeding the healthy development of the neurological connections between the hemispheres in our developing brains. My recommendation is for the education

research establishment to begin looking at screen-time and physical fitness as factors determining social and academic development from infancy. My role in this process would be to advocate movement activities for classroom teachers.

My path forward with this. In order for me to advance classroom movement activities, I see three essential avenues: my local education community, the state and national legislative and organizational levels, and the institutional research establishment in education. Essentially, I may act as a subcontractor with school districts or individual schools administering this and subsequent presentation trainings with teachers.

It is my greatest hope that this project is able to find legs and traction in the classrooms of teachers who embrace the mind/body connection and share that embrace with their students. With that embrace, they are moving as well. Improved health and a more enjoyable experience at work would be the highest and best achievements for me, if teachers were able to apply these movement activities in their classrooms for their students' benefit as well as their own. Movement can be meditative and cathartic, while presenters are leading the activities and not necessarily able to focus their minds on themselves, the movement activity could still make the workday pass with more good feelings and less fatigue.

Conclusion. In conclusion, I am happy to have achieved my goals of becoming a better teacher and a better learner. Very current research reflects untapped potentials for incorporating physical activities throughout the school day as a means of achieving experiences in education that accomplish better results in student performance and learning. There is much work to do in order for the education establishment to loosen the

grip of the testocracy and allow teachers to teach and to some extent, let kids be kids.

Kids need to move, they need physical movement throughout the school day in order to be at their best. As do all of us. The workforce as well as the education establishment is slowly recognizing that sitting is the enemy and movement is our friend. We, as the innovators in our fields must lead this charge toward a more science-based approach to achieving the ideal conditions for student cognition and development.

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