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Movement For Learners: Physical Activity Impacting The Academic Performance Of Elementary Students

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MOVEMENT BASED LEARNING:

PHYSICAL ACTIVITY IMPACTING THE ACADEMIC PERFORMANCE OF ELEMENTARY STUDENTS

By

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Introduction

Doctors will tell developing youth that physical activity is important, yet our school systems allow for only limited amounts of physical activity in the average school day. We all know that physical activity is important for the health of all human beings. At the same time, teachers are trying to improve learning while also finding new ways to grasp the attention and focus of all students. Yet, I have seen the trend of sedentary classrooms time and time again. It is time to take our knowledge of health and incorporate it into our classrooms.

If students are sitting all day, they are likely not to participate as actively as they could if they had movement throughout their day. In my experience, when students take movement breaks during the school day, it has significantly helped their focus as they move on to the next subject. A correlation seems to exist between the activities that students do inside and outside of their school day that also improves overall academic achievement.

I plan to investigate to find what the correlation between physical activity and academic achievement is. I believe that we will see an impressive amount of academic achievement reached if we only added more physical activity into students' lives. My research question will be: *How does physical activity impact the academic performance of elementary students?*

Chapter One Overview

This chapter will address the rationale for studying how physical activity impacts the academic achievement of elementary students. First, personal experiences and what I have noticed from students of my own will be addressed. Physical activity is an important study because of the positive impact I have personally witnessed. I will then address the impact of the study. When we notice the positive impact of physical activity, it will make a difference for teachers, parents, and students. Lastly, the themes used throughout my research will be stated. The three themes are physical activity, understanding the brain, and assessment. Chapter one will end with a summary and explanation for what is to come in chapter two of the thesis.

Personal Experience

Elementary school is a great time to explore many curricular and extracurricular activities because various activities are available to students. It is the perfect time for getting exposure to find many different interests. As an elementary student, I was involved in numerous extracurricular activities: soccer, studio dance, piano, and Girl Scouts. These activities kept me very busy and active. I was a high achieving student, but I believe it was because I had proper exposure to physical activity outside of my school day.

A family member, which will be referred to as Matt, is another example of how I have watched physical activity impact schooling and academic achievement. Currently, he is a ten-year-old. Matt has a learning disability and qualifies for an Individualized Education Plan through his school. When he was in Kindergarten and first grade, he significantly struggled with both reading and math. There was talk of him being held back a grade level to help match the grade reading level. The school decided not to hold him back a grade and agreed he should continue into second grade.

In second grade everything changed for Matt. He suddenly advanced two reading levels and no longer needed an IEP in math specific subjects. While learning still was not easy for him, he had made a great amount of achievement. Everyone from teachers to family members wondered what had changed. What changed? He joined soccer in the fall, basketball in the winter, and baseball in the summer.

As Matt has continued through elementary school, he has also kept up with sports. Any downtime throughout sport seasons, there is always a slight drop in his academics. Physical activity has proven to help his schooling. As he enters fourth grade soon, he is officially off his IEP in mathematics. While Matt remains on an IEP for reading, he has now reached grade level and is not far behind the rest of his class. The improvements physical activity has made for him has been crucial for his academic success. Knowing this, I became fascinated with how much physical activity could impact a student's achievement within school.

My student teaching experience also influenced me to look further into how physical activity impacts academics. One elementary school was particularly sedentary and I could see the desire these students had to move because of their constant wiggly bodies during learning. The students had no physical education and recess was led by their teacher. Because I was in a specialist's classroom I observed a variety of ages and classroom structures. Teachers often complained of having difficult days with their students. Near the end of my student teaching experience, timing allowed us to bring them outside to play kickball and other yard games. The teachers raved about this experience for the kids. By the time the students came back to class, they were ready to learn and had a much higher attention span.

I have watched my students time and time again improve academically because of physical activity. Students have a better attention span and are more likely to achieve at the work they do within the classroom. My students have inspired me to look further into this topic. There has to be a correlation between physical activity and academic success. I plan to look further into this research and find more concrete information for how the two are related to one another.

The Impact of the Study

By knowing there is a correlation between physical activity and academic achievement, teachers can make changes within their classroom. If we know that movement will make a difference on the work in the classroom, we can begin to add more movement into the lesson plans. Many students love hands-on experiences and I believe we often do not give them enough kinesthetic activities within the classroom. Students could have a higher amount of academic success simply by moving while learning. By understanding these changes of physical activity, improvements could be seen in classrooms and overall academic success. If there was a significant impact on academic success, the Department of Education may even begin to regulate and require more movement throughout the school day.

Parents and guardians may also see the impact of physical activity from their learners. While some may argue students are involved in too many activities if they understand the benefits of physical activities they may encourage their students to participate inside and outside of school. Parents and guardians are a big influence on their children, so their involvement is very important too.

Most importantly, all students will benefit from this study. Students love to move. Having all of the important adults in their life encouraging and regulating the amount of physical activity

they are exposed to will aid students. If there are confirmed improvements in their academic success as well, then students will be achieving and understanding more by simply adding more physical activity into their life.

Capstone Themes

I believe movement can have a significant impact on students because they are releasing built up energy and receiving more oxygen in their brains. This helps their overall health, attention span, and focus. I want to gather the specifics on how it directly impacts the classroom. I will look into the improvements seen in the classroom because of physical activity and look at the percentage of kids involved in physical activity. From the research, we will be able to answer if there is enough evidence for physical activity needed in the average day of an elementary student.

In order to organize this research, there will be three different themes. The three themes will be physical activity, understanding the brain, and assessment. These themes will be significant because we need to understand each of the themes on their own, before connecting them to see the impact of each.

The first theme is physical activity. The first investigation is the impact of physical activity and how it affects the bodies of elementary students. It is important to address what kind of physical activities students are involved in because it may have an impact on their academic achievement. Different schools and classrooms use different amounts of movement. The investigation of how often physical activity is incorporated into the classroom will be determined to decide how it could be altered to add more movement.

The second theme is understanding the brain. Observations of how the brain develops will happen first, then consider how the brain develops as a result of physical activity. By understanding the brain, we can determine exactly how physical activity is making an impact on the success of the students.

The third theme will then be assessment. I will first address the different forms of assessment to understand which may be the best form for collecting data. In order to understand if students are showing improvements, there needs to be an understanding of the type of assessment. Properly assessing students in a variety of ways can prove the benefits of physical activity. The variables of assessment form must be equal for all students involved in the study, but we need a before and after of similar assessments in order to see if there was an improvement made.

By studying the improvements that are caused by physical activity, we will be able to explore if there is a correlation to academic achievement. If students are getting better grades when they are physically active, it is likely a result of the movement in their life. The variables must be equal for all students involved in the study, but we need a before and after of similar assessments in order to see if there was an improvement made.

Chapter One Summary

Physical activity is important for the overall health of developing elementary students. Through my personal experience and my observations of students, I have realized that movement is important for academic learning. Adding movement into the daily life of students may significantly impact students' academic achievement.

Through data collection and analysis, I will answer the question: *How does physical activity impact the academic performance of elementary students?* and address three different themes: physical activity, understanding the brain, and assessment. Each theme will be studied on its own, then the connection between all three will be studied. By looking at all three themes and their connections, how physical activity impacts the academic performance of elementary students will be discovered.

Chapter Two Preview

Throughout chapter two of my research, a combination of sources will be used. The sources will be used to compare and contrast physical activity and how it is used in the classroom. Different teachers and researchers have led their own studies on physical activities within the classroom setting. They have also used their classrooms or studies to discover how much physical activity is useful and beneficial for the classroom.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This research examines the question: *How does physical activity impact the academic performance of elementary students?* It will examine how physical activity is used throughout the school system currently; first by looking at a number of recommendations and implementations in schools, then determining how schools typically include this level of physical activity. Secondly, the impact of physical activity on the brain will be examined. In order to understand the benefits of physical activity, the changes throughout the anatomical brain must be understood. The third section will cover how assessment can be used in order to properly study

and collect data on the benefits of physical activity. Lastly, this research will investigate different classrooms settings that have attempted to implement more physical activity into their learning day.

Physical Activity

Before looking at how physical activity affects the classroom, the type of physical activity students are exposed to must be considered. Once it is stated what classifies as physical activity, the effect of movement can then be addressed. Along with the type of movement students need, the rigor of the activity will be discussed. Next, this section will explain how physical activity will be measured. Once the measurement is discussed, this section will explain where schools are today. Common trends and requirements of physical education will be determined. This will draw attention to the lack of movements students are being exposed to as time goes on. Finally, this section will address where schools are now and the amount of recommended exposure to physical activity. Knowing what physical activities students are involved in will help the study in understanding how physical activity directly impacts the academic success of students.

Importance of Physical Activity. Physical activity can be considered any kind of movement. For the purpose of this research, the physical activity will be classified into different categories. There are four levels of physical activity that require different amounts of effort. According to the National Academic Press (2013), the four levels are sedentary activity, light-intensity activity, moderate-intensity activity, and vigorous-intensity activity. Sedentary activity includes sleeping, lying down, sitting, and watching television, while light-intensity

activity includes standing, slow walking, making the bed, cooking, etc. As the intensity increases, moderate-intensity includes activities such as table tennis, walking, and ballroom dancing. Vigorous-intensity includes activities that are athletic such as running at various speeds, shoveling snow, and mowing the lawn. A good balance of all four types keep the body active and physically healthy, but they must have exposure to moderate and vigorous activity as well. The moderate and vigorous activity keeps the body in excellent shape.

To really understand the level of physical activity being exerted, the amount of movement is measured in metabolic equivalents known as METs. “One MET is the rate of energy expenditure while a person is at rest and is equivalent to an oxygen uptake of about 3.5 ml/kg body weight × min” (Kohl & Cook, 2013, p.39). Sedentary activity is anything less than 1.5 METs, while vigorous activity is around 6 METs. The recommended amount of METs for health benefits is 3 to 6 METs, meaning it is best to do moderate-intensity to vigorous-intensity each day.

Kohl and Cook (2013) examined the study of The Physical Activity Guidelines Advisory Committee. They looked at the number of METs elementary student-aged kids should be exposed to. While it is difficult to have a set number for all students, they averaged 60 minutes or more of moderate to vigorous activity was most helpful. They believe that 3 of those days should be vigorous activity that strengthens muscles and bones. Often elementary students are not getting that type of exposure. It is even less likely if the student does not have exposure to physical education classes.

Despite these findings, schools are decreasing the amount of movement. There could be many reasons for this, but Kohl and Cook (2013) suggest three main reasons.

> "First, the 60 minutes per day of physical activity that is health enhancing is nearly impossible to achieve through physical education, even with the highest-quality physical education curriculum. Second, quality physical education must include time for teaching activities and lessons that may not be physically active. Third, political and economic pressures on education systems to improve standardized test scores have had the unintended consequence of reducing or eliminating physical education curricula and thus students' opportunities for physical activity" (Kohl, p.1).

With these three main reasons as a focus for many schools, physical activity is often low on the priority list. Most schools believe they need to focus on the academics before thinking about the health of students. Certainly, teachers do not want to harm their students, but they strive for excellent academic achievement. Unfortunately, there is little consideration of the amount physical activity can help their academic achievement.

Physical education is one way in which schools are able to monitor that students are getting recommended moderate to vigorous movement. School Health Policies and Practices Study (Hunt, 2013) gathered that there is a trend in physical education lowering throughout the United States in elementary schools. In 2000, 78% of states were requiring physical education. The number increased to 80% by the year 2006. While the number of states of required physical education increased, the requirement did not state how often students should be exposed to physical education in a given week. In 2000, only 25% of schools were requiring 3 days of physical education in a week. The percentage dropped even lower by 2006 at only 14%. In 2000, 10% of schools were required to have physical education daily for half a year, which dropped to

5% in 2006. An astonishing 8% of schools required physical education daily year-round, dropping even lower to 5% in 2006. The numbers just keep dropping and physical activity is no longer a focus for the majority of schools and the districts to which they belong to. Physical education needs to be implemented back into schools to keep healthy students or classrooms need to find ways in which they can get their students moving. The majority of time elementary students have in a given day is spent in the classroom. They need movement within their classrooms.

***Other Important Physical Activity Benefits*.** While physical activity does improve overall health which affects the academic success of students, it holds many other benefits as well. These benefits are just as important because if students are not healthy, they will not learn as successfully. Centers for Disease Control and Prevention (2018) states that active students are less likely to develop "heart disease, cancer, type 2 diabetes, high blood pressure, osteoporosis, and obesity" (p. 1). What is even more shocking is the risks built up against students that are not active. The Center for Disease Control and Prevention (2018) also states the risk involved with non-active students. Heart disease can include hyperlipidemia, high blood pressure, and insulin resistance. These risks are likely to include type 2 diabetes and obesity. Low bone density from lack of exercise can also lead to osteoporosis. Breast cancer, colon cancer, endometrial cancer, and lung cancer are all possibilities with low rates of activity level. The most common health risk that is likely to be noticed first is an energy imbalance. Students will have bursts of energy and then they will quickly crash and tire. Schools need healthy students to have healthy learners. The two factors go hand in hand. If students are ill, they will likely not achieve up to their full

potential like they may do if they are healthy. A simple 60 minutes per day could make a significant impact on the health of students.

Lack of Physical Activity in the United States. Relying on participation in physical extracurricular activities is not a reliable source for all students. Some students lack exposure for many different reasons including financial stress, no transportation, no interest, etc. Schools cannot rely on students participating in outside activities. A study from Stanford University led by Dr. London found that only one-third of students are likely to participate in an active activity outside of school. This means that if schools know physical activity will help their students, there should be a bigger focus on including physical activity throughout the school day.

According to the Center for Disease Control and Prevention (2018), the facts are confirmed. The study concluded, "Only 21.6% of 6 to 19-year-old children and adolescents in the United States attained 60 or more minutes of moderate-to-vigorous physical activity on at least 5 days per week" (p.1). Yet, the United States has one of the highest rates of obesity. Something must be done to increase the amount of physical activity students are receiving.

Physical Activity Conclusion. Elementary students need physical activity exposure. Schools should have a focus on providing physical activity in some moderate to vigorous level of intensity. The level of physical activity students are exposed to in elementary schools plays an important part in their health and learning. The next section will dissect what exactly physical education does for the brain. If students are properly exposed to physical activity it can hold important elements for the brain.

Understanding the Brain

Understanding the brain is important in order to properly know how movement affects academic achievement. In order to accurately consider academic achievement, what is happening in the brain must be understood. First, this section will study the way the brain works on an anatomical level. It will break down the seven steps of how the brain learns new content. Then, this section will give insight into different studies of how movement has beneficially impacted the brain. An overview of how the brain is impacted by physical activity will be then discussed. Lastly, this section will touch on how physical activity through the brain could impact academic achievement if implemented into the school system.

Functioning of the Brain. The human brain is a complicated machine constantly working to help human bodies function. There are several different parts to the brain, all of which have an important role of their own. Understanding the function of the brain and how it learns is essential to understanding the improvement of learning. A few areas of the brain must be understood first.

The thalamus gives information from sensory receptors to a different part of the brain. The cortical structures are the parts of the brain that do the higher level processing. The subcortical structures are both responsible for motor and nonmotor skills. The amygdala controls the response and memory of emotions. The hippocampus processes long-term memory and emotional responses.

According to *Teaching with the Brain in Mind* (2005), the brain learns new content in seven steps:

1) Input comes from our senses or is activated by thinking or memory

2) Information is routed to the thalamus for initial processing

3) Simultaneously, the information is routed to the appropriate cortical structures for further processing (occipital, temporal lobes, etc.)

4) It is also immediately routed to subcortical areas (i.e., the amygdala)

5) If it is an emergency stimulus, the amygdala will respond ASAP and recruit other brain areas

6) Later, information is sent to the hippocampus for more subtle evaluation and is held over time

7) Over time the hippocampus will organize, distribute, and connect the memories with other appropriate areas of the cortex for long-term storage.

These seven steps make up the main process for how the brain learns new content. All outside factors play a role in brain functioning, and movement can have just as big of an impact. When students are getting proper amounts of physical activity, this process will function without error and move along quickly. The gained oxygen allows for new cell development and quick processing among the cells.

Two other important parts of the brain are the prefrontal cortex and the temporal cortex. Both parts of the brain control thinking and memory. Dr. Scott McGinnis (Godman, 2014), a neurologist at Brigham and Women's Hospital and an instructor in neurology at Harvard Medical School conducted a study of this increased productivity through physical activity. It was found that people that were active for six months had a bigger prefrontal cortex and temporal cortex. He also discovered that there was an increase in the volume of different brain regions.

Based on this study, it can be said that those who exercise their bodies are truly exercising their brains as well.

Bergland (2013), a psychologist, has done a lot of research throughout his work on the different brain hemispheres. The hemispheres can be divided into the left and right cerebral, and the left and right cerebellum. He found that even simple gesturing can strengthen the hemispheres and cause them to work in better cohesion with each other. Gesturing every day will cause all hemisphere to strengthen. He states, "engagement of all four hemispheres through gesticulation enhances our cognitive, creative, linguistic, and problem-solving abilities" (Bergland, 2013, p.1). All of these qualities are helpful to students. Another important reason to strengthen the hemispheres is the small cerebellum holds 50% of the neurons in the brain. Students must strengthen and work to build the functionality of the four hemispheres in order to increase learning.

Another study in Finland (Bergland, 2013) studied motor skills and academic skills in students between the grades of first and third. The conclusion from the study was that "children with poor motor skills also have poorer reading and arithmetic skills" (p.1). With all this knowledge, it proves that physical activity is important for the brain and learning. Teachers that are aware of this study can begin implementing motor skills as part of their lessons to improve the strength of reading and arithmetic skills.

Physical activity increases learning functionality, which is important and necessary for young learners. There are a number of benefits physical activity brings to the brain. Eric Jensen, author of Teaching with the Brain in Mind (2005), notes that the brain experiences an enhanced mood, increased brain mass, better circulation, more brain cells, and improved cognition. Heidi

Godman (2014), a neurologist, says, “The benefits of exercise come directly from its ability to reduce insulin resistance, reduce inflammation, and stimulate the release of growth factors—chemicals in the brain that affect the health of brain cells, the growth of new blood vessels in the brain, and even the abundance and survival of new brain cells” (Godman, 2014, p.1). If the brain is like a machine, movement is like the oil that keeps the machine running. Proper exposure to movement and the brain knows how to keep going and complete an efficient task.

Retention of Learning during Physical Activity. The brain is more likely to remember and retain information based on the amount of physical activity included. When lesson plans include movement, students will be about to fire more neurons in the brain. For example, if the lesson is to learn the structure of a cell, two options are possible. The class could do written work by presentation and reading, or they could stand up and form the structure as a class. One of the options certainly sounds more fun and engaging, but it will also allow students to fire more neurons. Students will be more likely to remember the structure in an exam when they think back because they can think of the role they had and others had. This allows the brain to make more connections.

Two researchers, Boyraz and Serin (2017), led a study to incorporate movement into everyday lesson planning. They wanted to see the impact of retention when students had the opportunity to move while learning about a new topic. Their conclusion proved that physical activity is important when learning. Again, students were able to fire more neurons and build stronger connections. When they were tested on their retention level, they had a better understanding of the overall topic and were more successful in remembering the facts they

needed. Physical activity while learning a new topic and lesson can help students in their final assessment.

Understanding the Brain Conclusion. With all this research on physical activity improving the brain, schools need to take an active approach to work movement back into their school day. To ensure schools are doing this correctly, it is important to properly assess their findings. The next section will break down the different forms of assessment and how they can be used to properly determine how physical activity is benefitting the students.

Assessment

Now that the different types of physical activity students are exposed to and how it affects the brain have been discussed, it is important to look at all types of assessment used in the classroom. In order to understand if students are showing improvements in academic achievement, common variables must be seen. This section will provide an overview of the different types of assessment. After discussing the different types, this section will then cover how the forms of assessment can be used to measure academic success in students. By understanding assessment, there can be sufficient information gathered to prove how academic achievement is greater because of added movement.

Forms of Assessment

There are three main types of assessment. Susan Riley (2017), founder and president of Education Closet, defines the three types. The first type is diagnostic, which is used to identify current knowledge and/or misconceptions about a topic. This type of testing is good for pre and post assessment, often using self-assessment as a way to gather this information. The second type is formative, which is used to provide feedback during the instructional process. This type of

testing is good for viewing growth over time. Tests often include reflection journals, homework, peer reviews, etc. Formative testing allows students to receive feedback throughout the time of their unit. The third type of testing is summative which is used, to sum up learning at the end of an instructional process. This testing is good for mastery and performance/production levels. The testing usually includes high-stakes testing, final projects, and/or rubrics. All three forms of testing have their own benefits and are all important in the classroom.

Dr. Karee Dunn (2009), a K-12 focused psychologist, brings to light that formative assessment is equally as important as summative assessments. They both hold a place and can help each other. If students are being assessed throughout their working progress, they will get beneficial feedback to help them succeed. It also the teacher knowledge for where students might be struggling and where the class might need some clarification. Then when they have received formative feedback throughout a unit, they are able to be fairly assessed on their summative assessment. The summative assessment is a good representation of what they have gained and learned throughout the course of a unit.

Diagnostic, formative, and summative testing all of a place when measuring the impact of physical activity. Diagnostic testing has already been done. It is important to take the information you already have such as previous tests, projects, grades, etc. All of these statistics can be compared back to once physical activity has been implemented. Formative testing is arguably the most important form of statistics to gather when testing the implementation of movement. A teacher will be able to see if students are able to focus for longer. The teacher will also notice if they are comprehending lessons better. All of the improvements should be documented to prove the importance of physical activity. Along with these findings, it is important to include what

type of physical activity students got to do and for how long. Lastly, the summative assessment will prove how much progress was made once the amount of physical activity was increased. The teacher will be able to look back and see the amount accomplished on a test or project. Properly gathering data will prove if physical activity is working for students' academic progress.

Assessment Conclusion. This next section will include examples of teachers that worked towards implementing physical activity and gathered results based on the three different types of testing. Each classroom saw the benefit of having physical activity included in the school day. Students were able to focus longer and test scores were improved. The implementation of movement will specifically focus on how each teacher worked towards adding physical activity into the classroom day.

Implementation of Movement

Implementation of movement will be a combination of multiple studies. This section will look into numerous studies of classrooms that have incorporated movement. To begin, the section will discuss the different implementations of each study. Once stated, then the studies will be used to compare and contrast how movement impacted the specific students of each study. There will then be an overview of how all of the studies make claims about the importance of physical activity in the academic day. Lastly, knowledge of physical activity, the brain, and assessment will support the claims of each study.

Classroom Experiences

One classroom looked at using an intervention of movement in the curriculum. The experiment was designed to incorporate movement throughout a ninety-minute class period.

Stefanie Wells designed three specific forms of intervention throughout the class. The three forms of intervention were: brain breaks, movement throughout the lesson, and the use of stress balls. What she discovered was that by incorporating these three forms of movement, students were more likely to succeed. She studied several different areas, but she discovered similar results in all of her classes of intervention. The number of students out of their seat lessened, off-task talking significantly decreased, and fewer heads were down.

Dr. Amy Spence (2015) took an occupational therapy approach to her study within a classroom. Her specific focus was to look at the difference in on-task behavior both before and after movement. The average amount of time students were on-task before the movement was about 28 minutes. After implementing movement into the lessons, even during work time students increased the amount of on-task behavior. The class average raised to about 58 minutes. As a class, students were able to focus about thirty minutes longer than they were able to before movement. These are important numbers because every single student in the class was able to increase their focused time. One particular student was able to increase their on-task behavior by 9 times their previous amount. If every student had exposure to movement, some students would be 9 times as likely to succeed.

Collecting even more data, Dr. Spence (2015) was able to extend her research. She also looked at what students were doing throughout their class period. Five categories were determined: staring, fidgeting, peer talking, out of their seat, or on-task. Before movement was implemented, 43% of students were staring off into the room. 14% of the students were fidgeting in their seats. 9% of students were talking with their friends and 5% were out of their seat. This means only 29% of the students were on-task and working. After implementing movement into

their day, an astonishing 55% of students were on-task. Only 20% of students were staring, meaning a 23% decrease from before. Only 10% of students were fidgeting, again a 4% decrease. The amount of peer talking went up, but only to 14%. Lastly, less than 1% of the students were up out of their seat. The movement certainly increased the amount of focus and on-task behavior throughout the learning of each day.

Melissa Nalder (2015) led a research study within a classroom also looking at how movement changed the progress of students. She used time numeracy test results to compare how movement was effective. The test consisted of 40 questions and 24 students took the test. Before movement was implemented, the test took the students an average of 7 minutes and 3 seconds. The average score of the classroom was 33.96. After implementing movement throughout their learning day, the test took 5 minutes and 18 seconds. The amount of time decreased by about 2 minutes. Almost all the students did better on the second test or stayed around the same score. The class average of their test scores after the movement was 35.22. Students' scores, on average, increased by 1.26. Her findings demonstrate that no matter what kind of learner you have, movement is beneficial for all students. It certainly does not hinder the classroom to include more movement throughout the day.

Another study was done by Shawn Larkin (2014). He used students to evaluate their own learning. Before movement and after movement, he asked them, "Are you engaged in your learning?" He measured their answers throughout the length of the day. At 9:20 A.M. only 17 students said they were engaged and 8 students said they were not engaged. At 10:05 A.M. 22 students were engaged and 3 students were not. 11:25 A.M. 17 students were engaged and 8 were not. At 11:55 A.M. 19 students were engaged and 6 were not. At 2:35 P.M. 16 students

were engaged and 9 were not. At 3:15, the numbers returned to 17 engaged and 8 not engaged. After movement brain breaks were used, there was a difference each hour for 25 students. At 9:35 A.M. 20 students were engaged and 5 were not. At 10:10 A.M. 15 students were engaged and 10 students were not. 11:25 A.M. 15 students were engaged and 10 were not. At 11:55 A.M. 19 students were engaged and 6 were not. At 2:40 P.M. 17 students were engaged and 8 were not. At 3:10, 16 students were engaged and 9 were not.

On average without brain breaks, 18 students were engaged in their learning. With brain breaks, an average of 17 students were engaged. Though the number dropped, it proves that just simple brain breaks may not be enough. Students need active, engaging movement to increase their engagement. The last question he asked at each time was, "Do you feel different than you did before the movement break?" An average, 20 students said they felt better after including the movement. This is still evidence enough to conclude that movement is important. Movement changes the way in which they learn, despite their level of engagement.

Lasty, Elizabeth Balcom (2017) used another study to decide the cost, preparation time, and effectiveness of adding movement to lesson plans. She set three categories as goals to be included in her lesson planning. The three categories included: brain breaks, reminders to move, and get the conversation going. She found that all three categories were cost-effective and cost her little to nothing. She also found that all three categories were highly effective in the learning of her students. The only variable that differed throughout her experiment was the amount of preparation time. Brain breaks took her a lot of preparation time, but reminders to move and get the conversation going did not. This is something to be considered and partly the reason for this research. Teachers need movement ideas that do not create a lot of preparation time.

Helpful Movement Resources. Many lesson plans do not currently include movement because of thoughts of the traditional classroom. The traditional classroom has a teacher up front and the students at their desks. Emily McGregor (2014) did research on what subjects areas were likely to incorporate physical activity into the lesson. She had a number of teachers report back on how often they used physical activity in each subject. What she found is not many school subjects included movement in their lesson plans. Based on her data, English was the easiest to include movement. English had 5 days of integration, Mathematics had 4 days, and Science and Social Science had 3 days. Music had 2 days of movement. Art, Geography, and History were all 1 day of physical activity. Although these teachers were not successful in incorporating movement throughout all of the subjects every day, it was just the beginning. Tools and creativity can really help teachers as they plan to include physical activity in their lesson plans.

There are many online resources that already exist to incorporate brain breaks. When using them in the classroom, a brain break is a way in which students get movement throughout a transition in their learning.

One very popular site is called GoNoodle. It was created in 1999 and has now become a popular site used in elementary schools. This website has many fun, engaging videos for elementary students. The videos are about being silly and getting bodies of students moving. The resource was designed with brain breaks in mind. Brain breaks are used to take the focus off of a hard lesson for 3 to 5 minutes or to be used in a transition period between different pieces of their academic day. The videos typically are not learning tools that could be used throughout a lesson. A few of the videos may have a fun relation to a topic such as space or the outdoors.

There are several options to explore, but most of these brain breaks are fun ways to get students moving in transition periods.

Another resource that can be used is the Colorado Initiative. This program was designed by the Colorado Education Initiative in order to create more movement opportunities and include more brain breaks. While the program was specifically designed for middle school and high school-aged students, all of the activities can be used just the way they are or slightly adapted. The resource is still helpful for elementary teachers. The resource includes breathing/stretching, yoga, brain teasers, energizers, YouTube videos, and more. Colorado Initiative was designed to reduce stress throughout the school day. This is important for elementary students too.

There are many tools online such as blogs, Pinterest ideas, theatre games, and team-building activities. All of these resources are valuable when designing lessons or planning for brain breaks. Students will love the incorporation of the movement and have fun as the building trust throughout the classroom. There are so many different resources to choose from it can sometimes be overwhelming to teachers. A lot of time is implemented in making and finding the best lesson plans as possible. Teachers have to worry about all of the different learning needs while assuring students will still learn the material at hand. Often, they do not have the allotted time necessary to find or create curriculum with the inclusion of movement. Knowing how beneficial movement is for students is motivation for teachers to try to find those materials. They often give too much of their time trying to find the best for their students. While there is an overwhelming amount of sources, they are scattered throughout different locations. A singular resource is needed to incorporate all of these classroom movement ideas into one place.

Implementation of Movement Conclusion. All of these studies have led to one important conclusion: movement is important and effective throughout the classroom and in helping students achieve academic success. Adding movement to everyday lesson plans can be effective and beneficial for all types of students, despite their learning styles.

Having enough movement in an elementary students' day is increasingly important because there are so many benefits. The health of their physical well being is increased, the development of their brains are stronger, and their improvement in academic success is shown through their studies. All of these teachers and professionals have stated significant improvements by changing one element in their classrooms: added movement. Without a doubt, elementary students are known for their time running and playing outside. All they want to do is move. Perhaps their bodies are telling important information for the future of education. Elementary students in more implementation of physical activity throughout their school day to truly benefit their academic success and overall well being.

Chapter Two Conclusion

Movement is essential for academic success. It helps students of any kind by creating engaging and fun lesson plans. Students are more likely to participate and be a part of the lesson if they are asked to engage in the material. The days of sitting at a classroom desk to learn best are far gone. With the amount of research and studies proving the benefits of movement in the classroom, it is a wonder school systems have not worked towards incorporating more. All students need activity. The place they spend most of their waking hours should be a reliable source of activity. Beyond that, learning with physical activity is fun. Adding movement makes

students feel excited about what they are learning and more likely to remember it. Physical activity in lesson planning should be as necessary as good objectives or assessments.

Summary

Chapter two addresses a number of research and studies related to movement in the classroom. As the literature review started, physical activity was explained. When discussing physical activity, the effort was broken into four categories: sedentary activity, light-intensity activity, moderate-intensity activity, and vigorous-intensity activity. The amount of activity was determined by the amount of METs exerted. It was determined that students need moderate to vigorous activity in their day to improve the well being of their overall health. A school must be a place for moderate to vigorous active hours because only one-third of students are likely to participate in an active extracurricular activity. Students spend most of their time in a classroom per day, so that classroom must be a significant part of the physical activity they receive.

The next section looked at what physical activity can do for the brain. It first covered the seven main steps of how the brain learns new content, then addressed specific parts of the brain and their importance. The four hemispheres of the brain were discussed. Working all four hemispheres will allow the brain to work together and function as a whole. Students need hemispheres that work together to properly develop their brain and increase the health of their brain development. Lastly, the research of Finland discovered that those with low amounts of motor skills were also less likely to succeed in their academics. Increased physical activity will help manage and increase motor skills in elementary students. The brain needs physical activity to function well and properly develop.

The third section discussed assessment. Breaking assessment into three different categories, it was determined that formative assessment would be best in measuring the progress of how the movement has helped the classroom. Diagnostic, formative, and summative assessment are all important factors to consider when looking at the overall success of classroom benefits from movement.

The final section explained different classroom studies that have taken place. Each study points to physical activity as an important part of the classroom. Many benefits from focus and engagement to classroom tests and scores all occurred. All of the sections prove why physical activity is an important factor in the health and success of a student.

Chapter Three Preview

As the research on movement in the classroom continues, chapter three serves as an introduction to this project. It will address the next step of the research and whom the project is intended for. Explaining the project will leave the reader with a clear understanding of what it will help teachers to do in the future as they work towards including more movement in their own classroom and lesson plans.

Chapter three will explain the website that will be designed for teachers. The website will serve as a tool for ways in which teachers will be able to get their students to a moderate level of physical activity while in the classroom. Within the chapter, the research framework will be explained and the project will be described with more depth. The chapter will also discuss the timeline for which the project will be completed. By the end of the chapter, there will be a clear understanding of the project and how it will be used by educators.

CHAPTER THREE: PROJECT DESCRIPTION

Introduction

Movement is important for most elementary aged student as they are growing and developing. As the research has progressed, the main question being addressed is: *How does physical activity impact the academic performance of elementary students?* This chapter will explain the different resources included in order to provide teachers with one essential tool to involve movement in their classroom.

First, the rationale for building a website as a resource for elementary teachers is included. All of the movement-based teaching resources that already existed are now combined into one accessible website. This section will then lead to an explanation of how the website will be developed, what is included, and how it can be used. Lastly, this section will end with a timeline for completion.

Project Overview

Movement in the classroom is beneficial for academic learning as *Teaching with the Brain in Mind* (2005) suggested. Knowing this, conscientious educators will do their best to implicate movement within lessons plans and throughout their day. As a result of the research, it is evident that teachers need one simplified website designed specifically for them to accumulate as many movement resources as possible. This section will explain the types of materials and resources that will be accessible to all elementary teachers.

The website developed includes a variety of videos, blogs, and lesson plans. Teachers will have easy access to all the sources they need related to movement in the curriculum. By including all these resources in one place, teachers will be more likely to include movement

throughout their day. To best address what teachers are in need of and how teachers like to collect information, discussion of the Research Paradigm is needed. Teachers have limited time to put together very detailed plans for their classroom. The Research Paradigm will talk about the importance of having accessible research and sources in one area.

Research Paradigm

Teachers have access to an abundant amount of resources online. Creating and sharing lesson plans have become easier than ever before because of online source sharing. Often, teachers are willing to share their works and keep blogs on what they are discovering throughout the school year. Teachers that share information with other teachers have their students' best interest in mind. If they find something that works, they want to share the information with other teachers to help other students too.

A common struggle for teachers is the lack of time to delve into new material and create thorough lesson plans. With so many resources available it is difficult to navigate because the resources are not centralized. "Teachers don't have enough time to create every lesson from scratch. Sometimes it's best to leverage the expertise of others who've perfected their lessons over time and adapt and modify them as needed" (Common Sense Education, 2017, p.1). Websites make it easy to gather information and use what works best for each classroom. Many sources are already created to guide teachers as they create lesson plans. The problem is that a lot of the materials already exist, but are not found in one central location. Often teachers have to navigate through many different sources and blogs. The research process ends up taking valuable

time away from lesson planning because they have to search and read many different sources. Teachers need a collection of all the resource in one place.

Choice of Method. Websites are an incredibly easy and resourceful way to get information out to a group of people. The website includes classroom resources and tools for teachers to easily access. When resources are put together in one central location, teachers gain quick entry to finding a resource that they need. Teachers will also become familiar with the layout of the website when they use it often. When teachers are already familiar with a website, they will be able to move through quickly and discover materials that they need in a short amount of time. In addition, they will not have to search all over the internet. Having all of their necessary resources in one central location will encourage teachers to include more movement. If they have the resources and it saves them time, the likelihood of teachers using movement will be increased. Ultimately, the more teachers that use movement in learning, the higher the academic success of students.

Audience. This website is designed specifically for teachers. Each part of the website includes resources to help teachers plan quickly, to see what works, and to encourage them to include more movement. Teachers need accessible lesson plans and ideas, especially those that have been tested and applied to a real group of students. Resources include information about how adding movement will improve the work and focus of students. Parents may also find this site to be resourceful. Understanding the direction teachers are moving and the ideas being used will motivate parents to help out with the amount of movement students are being exposed to. The intended audience for this website are teachers, but parents can benefit too.

The creation of the website was the best way to give quick and accessible movement resources to teachers. Teachers are in need of one organized website that all sorts of resources collected in one place. Planning will be a lot smoother and lessons will be more likely to include movement. The next section will explain how the website will look and what resources will be included. The Project Description is a glimpse into what the website will look like in it's completed form, and how it will serve both teachers and parents/guardians of students.

Project Description

This website designed for teachers will serve as one unifying resource for all learning tools related to movement. There is a variety of sources to choose from, while also including choices of how to implement movement into the learning day. First, an explanation of each section of the website is included. Each main topic is listed under tabs. Each of the following paragraphs will be titled the same as the tab on the website. Each tab will explain how that source will be used to implement movement to improve the academic success of students.

Lesson Plans. The first tab is a collection of different lesson plans that are movement based. There are a number of lesson plans collected from different sites and newly created lessons in one area. This section is organized by subject. Next to each title in parentheses there are suggested grade levels. All of the lessons plans are adaptable for each grade level with a little creativity. Each link underneath the description of the lesson will go directly to the source where the lesson plan was received from. If there is no direct link, that is because it is a newly created lesson plan without a source. While not all are directly lesson plans, there are some ideas on what to do and how to incorporate movement into the lesson. There are a number of great

resources for all core subjects to be used. Sometimes it is beneficial to look through another subject because it can give ideas as to how to implement movement in a different subject.

Brain Breaks. The second tab combines all of the resources collected to use as brain breaks. Again, brain breaks are typically used to refresh the brain of learner when working on a hard lesson or used in transition periods. The resources will serve as movement provided in transitions and breaks. Sometimes students will work very diligently, and then they need a movement break. This break will allow them to refresh and re-energize their brains so they are ready for the next learning moment of the day. There is a number of videos and materials that teachers can use to get their students moving in a transition of the day. There are direct links to videos or websites that have a lot of different videos to choose from. Instructions are also listed in a sub-tab to indicate how to use brain breaks without videos.

Others. The third tab includes all other resources that will be helpful to teachers as they work to include movement in their classroom. This section contains blogs that teachers are writing on about movement in their own classroom. It also includes different programs or research about movement in the classroom that will be beneficial information for teachers.

The website created will benefit teachers as they complete their lesson planning and try to include more movement in the classroom. A lot of work went into assuring the best resources are available for teachers. The next section will include the timeline and pace for creating the website.

Timeline

The timeline will break down the pace at which the website was created. The full website was up and running by the end of November 2018. The website foundation and base were the first to be created. All tabs were created within a different time frame.

Foundation. The first part of this project was creating the foundation of the website. Weebly, an online platform, was used to create a foundation for the site. The first step was constructing basic information and a home page. The website foundation also included a theme to best address the layout of the webpage. The foundation of the website was completed by the middle of September.

Lesson Plans. The second part of this project was to create information on lesson plans. I worked on the layout of the lesson plan tab first. I also worked to collect information and resources on all different types of lesson plans. Because this was the biggest section of the website, this part of the project took the longest. I wanted to have all of the resources in a neat and organized layout. To stay organized, I kept a chart that included all the sources, where they were found, and why they were useful. This was helpful in creating the lesson plans tab. I had all the resources for different subjects on the website by the middle of October.

Brain Breaks. The third part of the project was creating the Brain Breaks tab. I had to collect information and resources on brain breaks before adding them to the website. I did the research and found that the chart as previously mentioned for lesson plans was also helpful when collecting different brain breaks. The resources and the tab on the website were completed by the end of October.

Others. The fourth part of the project required the adding of all other information collected to the Others tab of the site. I searched and found any blogs about implementing

movement into the classroom. I also tried to find programs and research done by other people to suggest teachers to implement more movement into their classroom. The completed form of this thesis is also found on this page. The Others tab of the website and the collection of all resources was also completed by the end of October.

Finally, all finishing touches were completed by the beginning of November. The website was published for public use by teachers, parents, and others that choose to access information and resources on movement in the classroom by the middle of November. Teachers are now able to use this site as a reliable, central location for lesson planning ideas related to movement.

Chapter Three Conclusion

The creation of the website for teachers to use was the best source possible. Teachers have quick access to shared resources that are beneficial to helping them plan their lessons. There was a variety of movement sources, so teachers now have options as they are planning each day. By creating this website, teachers can put a focus on their students. Ensuring students are getting access to healthy movement that will improve their learning.

Summary

Teachers were in need of a central location that includes resources they need to know about movement in the classroom. Creating the website with teachers in mind that includes lesson plan ideas, brain break ideas, and other blogs or research that address movement in the classroom all serve as helpful resources. There were four major parts in creating this website. The foundation of my website was completed by the middle of September. I then worked on my first tab titled, “Lesson Plans”. This tab includes all types of lesson plans in different subject areas that teachers can quickly use. The tab, “Lesson Plans”, was completed by the middle of

October. The second tab is all about brain breaks. This tab will include ideas for teachers to get students moving during a transition in the classroom. All resources were put onto the website by the end of October. The last tab will be titled, “Others”. This tab includes information on blogs from teachers currently in the classroom and research done to prove the importance of movement in a student’s life. This tab was also completed by the end of October. The completed project website and thesis will be completed by the middle of November.

Chapter Four Preview

The final chapter will serve as a conclusion for the project. Throughout the chapter, there will be a discussion of my gained knowledge based on the study. I will state the main discoveries based on my experience with the research question: *How does physical activity impact the academic performance of elementary students?* Then the literature review from chapter two will be referenced; here the specifics in research that have led to my final claims will be discussed. Diving into the project, the examination of the implications and limitations of the website will be determined. Based on my findings of physical activity impacting academic success in a positive manner, the discovery of future research will be addressed. Finally, I will dissertate how the results of physical activity can impact the academic success and the profession of teaching.

CHAPTER FOUR: PROJECT CONCLUSION

Introduction

The research question at hand was: *How does physical activity impact the academic performance of elementary students?* After the research, it can be confirmed that physical activity positively impacts the academic success of elementary students. In chapter four, the project of developing a website will be examined. The purpose of this website will be determined through implications and limitations within the profession. By determining the implications and limitations, it will help teachers prepare movement materials to incorporate into their lesson plans. The research will also address the literature review from chapter two to better identify how statics and discoveries have impacted the teaching profession as well. Chapter four is a look into how the project will serve the field of education to benefit students in their academic success.

Gained Knowledge

Through the research of physical activity impacting academic success, it is clear that students benefit from added movement throughout their day. School settings can be a crucial part of including this amount of active movement because students spend most of their hours in the day within the classroom. All research found positive impacts on the health of students, as well as their academic success. To be healthy, growing children must get at least 60 minutes of physical activity a day. Students will then prevent illnesses, help their developing brains, and have an increased amount of academic success.

Creating a website for educators also proved how physical activity is just beginning to become an important inclusion within the classroom setting. The first suggested use of a brain break was in 2004 by Roger Anunsen. (Changing Aging, 2014). He was teaching a brain health class when he realized that students could not focus straight through the class, so he attempted to "surprise" the brain. Educators followed suite incorporating ways for their students to also find

breaks. For elementary students today, teachers often use a number of movement-based videos. This allows their students to get out of their desk, safely move within the classroom, and get their blood flowing. Their brain essentially gets a break. Elementary teachers have also noticed improvements with added movement within their lesson plans. Students begin to retain information at a better rate. The website created holds these features that will allow more ease as teachers begin to design lessons with movement in mind. Overall, taking all of the tools and putting them into one centralized location will help teachers incorporate movement leading to higher academic success.

Personal Growth

As a researcher, I learned a great deal from the collection of sources. While I had always had personal beliefs about movement being important in the classroom, this study clarified the importance and the necessity of physical activity. I always knew adding movement to lessons could make learning more engaging, but I had no idea what it would do for them in regard to their health and academic success. As an educator, I plan to always involve physical activity in my lessons and be aware of the amount of activities my students are being exposed to each day. It has also encouraged me to share my knowledge with other educators. The proof behind the studies is evident, so chances of other teachers experiencing positive results is high. I will always advocate and encourage for movement in the classroom. The simple addition could change the lives of students mentally, physically, and academically.

Addressing the Literature Review

Physical Activity. Researchers have proven that physical activity is important for all human beings, but especially those that are growing and developing. “60 minutes per day of physical activity that is health enhancing is nearly impossible to achieve through physical education [alone], even with the highest-quality physical education curriculum” (Kohl, 2013, p.1). Despite 60 minutes of physical education not being enough activity for students, the amount of required physical education is continuing to drop. Knowing that students are not getting enough physical activity to be healthy should be an alarming finding as growing rates of childhood obesity continue.

School systems must find places to encourage the amount physical activity students receive within a day. This way students remain healthy enough to be strong learners. Centers for Disease Control and Prevention (2018) notes that active students will be less likely to develop “heart disease, cancer, type 2 diabetes, high blood pressure, osteoporosis, and obesity” (p. 1). The school system can play a crucial role in ensuring students are getting active movement in their day to avoid complications of illnesses. The bodies of developing elementary students must also be in good health to have proper brain functioning.

Understanding the Brain. The brain is a constant developing part of an elementary student, so it is important to nurture the development of their brains. As noted by Dr. Scott McGinnis, people that were active for six months had a bigger prefrontal cortex and temporal cortex, while also including increased volume within different regions of the brain (Godman, 2014). There was also a correlation between the amount of physical activity and hemispheres working together. The more physical activity included in the day, the more the brain’s hemispheres are working together to increase “cognitive, creative, linguistic, and

problem-solving abilities" (Bergland, 2013, p. 1). Overall, the brain has an easier time collaborating within hemispheres to improve brain performance.

Not only is exercise important for the development of the brain, but it is also important for retention in the brain. When the brain is exposed to physical activity throughout the day, students are able to fire more neurons and retain more information (Boyraz, 2017). Brains have better functioning when exposed to physical activity overall. The purpose of this research is to benefit people and nurture the brain the best way known. Only with proper assessment can the results of brain functioning and retention be seen.

Assessments. To properly acquire information about the results, proper testing must be in place. The best way to determine the difference that movement creates in the learning is to institute a pre-test and post-test. The two other ways teachers can collect information is through the formative and summative assessment (Riley, 2017). The formative assessment creates noticeable differences as they are progressing through the lesson, while the summative assessment will be the final cumulation of the knowledge gained. Keeping a record of the changing results will prove the importance of physical activity held within lesson plans. As teachers use the sources included in the website, it is important for them to keep track of assessments to ensure the improvements of their students.

Project Implications & Limitations

Project Implications. By creating a website, all educators will have access to one unified tool, so teachers will not need to waste time planning the best lesson because all movement resources are now centered in one location. There is such limited time for teachers to plan lessons that are thorough and best for the students. The website allows them to diminish their

search time since they only have to go through one site. Once they are familiar with it, they can easily access the materials they need by subject or movement needed.

The website also explains the importance of movement throughout the school day. By describing the impact and how the movement will benefit students, teachers will be inspired to incorporate movement. Once they notice the improvements in students' academic success, they will add more movement into future lessons as well.

Lesson Plans. The first tab created on the website is lesson plans. Each core content area includes lesson plan ideas that can be incorporated specifically to that subject. Dividing it by subject will help teachers in finding the material they need quickly. The lesson plans also state the most appropriate grade level in parentheses. Short summaries of the lesson plans will also help teachers search through with ease and not eliminate valuable time reading pages of text. The design of the lesson plans keep the typical structure of a classroom plan but educate teachers on how to include movement. Once teachers use selected lesson plans from the website, they will also feel more comfortable in creating their own lessons with the inclusion of movement. Lesson plans are often set while working at a desk, so lesson plans with movement are often beyond a teacher's comfort zone. Incorporating movement will make a significant impact on classrooms as they work towards including more physical activity in everyday learning.

Brain Breaks. The second tab included on the website is brain breaks. The brain breaks are designed for teachers to use in transition periods of the learning. Guided movement is laid out for teachers so that they can find different ways for students to participate in the movement. There are two different sections, one for instructions and the other for video. The instructions lay out ideas for teachers to incorporate. They are often team building activity. The videos are a way

to get students moving, while also having someone other than the teacher leading it. The idea of the brain break is to give students the chance to divert their focus for a little bit. Once they come back to the subject at hand, they are able to focus for a much longer period of time.

Others. The collection under the tab titled Others will include any other resources that would be significant to teachers. The completed research of this thesis is posted to share more information and verify research done. Teachers will have direct access to if they so choose to learn more. There are also links to different blogs written by current teachers testing movement in their own classrooms or professionals that encourage the use of physical activity in classrooms. The third collection under the "Others" tab is titled, "Resources" which contains any other materials that teachers may find useful as they add in materials on their own or more data to confirm the benefits of added movement.

Project Limitations. Though the website offers many different options for teachers to include movement in their classroom, there is no way to include everything. There are many different sources that still exist. If teachers become reliant on this website alone, they will not have exposure to different types of materials that may not be found on the current website. Teachers may also become familiar with having the same type of movements included in their lessons, instead of switching up the type of movement style. Some students may strive in movement forms that are not included on this singular website.

Another limitation of the website is the need for it to be updated as time goes on. As research exceeds the knowledge of movement in classrooms that is currently known, it may not be included on the source that teachers are continuing to use. For the website to be the best resource available, teachers must keep up to date with the research. The website development

must also follow current trends and seek new information to be updated on the website. Future research is incredibly important for keeping this website advantageous.

Future Research

Thoroughly keeping a record on the impact of movement in the classroom will continue to benefit the academic success. Future research is important to understand in order to keep the best practices within the classroom. A helpful study to further this research could include the number of teachers that use the website. Knowing teachers that are implementing the movement lesson plans or brain breaks into practice will help to know how useful the sources include on the website truly are.

The teachers that use the website could also document and record data from their own students. This would help to know how movement in student learning has impacted their academic success. Once enough data is collected, then the website could also include the results on each lesson plan or brain break to encourage more teachers to use movement in their own curriculum.

Classrooms that do not have much practice in movement implementation currently would be most helpful in the collection of new data. They should include a variety of assessment types to get an accurate data collection. Once teachers of those classrooms have used lesson plans and brain breaks included on the website, they can determine how the data has changed by the implementation of movement. The variety of assessments should also be used after including movement to see how it truly impacts all students.

Profession Benefits

The website created could change the way school systems see the importance of movement. With the ease of finding sources on one website, teachers are more likely to practice the implementation of movement. As more teachers see the benefits of movement in the classroom, it will also encourage more teachers to begin teaching with movement. If there are enough teachers that see significant results, the inclusion of physical activity in learning will increase. As the teachers continue to practice movement in their curriculum, school systems and districts will start to notice.

Once movement while learning has reached a district-wide recognition, districts may decide to regulate and enforce the inclusion of physical activity in the classroom. If students are retaining information at increased rates, focusing on learning for longer amounts of time and test scores have made an improvement, the Department of Education within states may also recognize these positive changes. Once the change of movement reaches the Department of Education, they may also begin to regulate and encourage teachers to include movement in their classrooms. Both teachers and incoming teachers will become well educated on how to include more movement in their curriculum. Students will enjoy their lessons more and become more motivated to work hard on their school work. The simple changes of including movement in the classroom has to the potential to change the system of education.

Summary

Incorporating physical activity through the academic day can make a significant impact on learning, which directly impacts the profession of education. Through the research, adding movement into the curriculum will benefit students in their physical health, brain functioning, and academic achievement was concluded. This website provides one centralized location where

educators can access lesson plans, and teachers are encouraged to test and provide movement to their own students. The search time for teachers is lessened and they can now focus on creating the best lesson plan that will benefit their current students. While the website will be very helpful to teachers, it is also important that the website remains updated with the latest research. To advance the research, it will be helpful for teachers to keep track of their assessments to indicate the progress students make by the inclusion of physical activity. Movement inclusion has the potential to change the education system because teachers will begin to see great progress as students are able to focus on material longer, they enjoy the work they are doing, and they have higher rates of academic success.

Conclusion

At the beginning of the research, the question being considered was: *How does physical activity impact the academic performance of elementary students?* After furthering the research, it can be confirmed that physical activity positively impacts academic performance of elementary students. The knowledge I gained from the research proved to me students are improving mentally, physically, and academically with the simple addition of physical activity in curriculum. Movement throughout curriculum engages students, helps students focus, improves their brain functionality, and helps them achieve academic success. To communicate the importance of physical activity as part of the curriculum, I created a website that was designed for teachers to have quick access to ideas for incorporating movement in their lesson plans. The website encourages teachers to use lesson plans with the inclusion of movement or to use brain breaks in transition periods of their learning. The resources teachers will gain from this website

could have an essential part in changing the education system because it inspires teachers to include more movement. Knowing the impact movement can have on students proves the importance of physical activity to be part of lessons. As students begin to retain more information and develop brain functionality, they will achieve a greater amount of academic success. Physical activity in lesson plans can change the level of academic achievement.

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