

Brain Breaks Impacting Student Achievement

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Table of Contents

List of Tables	i
Abstract	ii
I. Introduction	1
Statement of Problem	1
Hypothesis	2
Operational Definitions	3
II. Review of the Literature	4
Introduction	4
What Impacts Student Achievement?	4
Reducing the Negative Impact of Stressors of Achievement	7
Types of Brain Breaks	8
Using Brain Breaks on a Daily Basis	9
Fitting Brain Breaks into the Curriculum	10
Conclusion	12
III. Methods	13
Design	13
Participants	14
Instrument	14
Procedure	15
IV. Results	17
Experimental Group	17
Control Group	18

Comparison	19
Summary	20
V. Discussion	21
Implications of Results	21
Theoretical Consequences	22
Threats to Validity	22
Connections to Previous Studies	23
Implications for Future Research	24
Conclusion/Summary	24
References	25
Appendix	28

List of Tables

1. Table 1: Experimental Group Weekly Means	17
2. Figure 1: Experimental Group Weekly Means Bar Graph	18
3. Table 2: Control Group Weekly Means	18
4. Figure 2: Control Group Weekly Means Bar Graph	19
5. Figure 3: Comparison of Weekly Means	19

Abstract

Children all across the United States have strict instructional schedules throughout the school day and many aspects, such as stress factors, home life, friends, and family impact their success in school. This study was done to determine the impact brain breaks have on student achievement. In this experimental design, 10 children in this first-grade class were given 10 minutes of brain breaks prior to completing independent work, daily. Seven children were not given brain breaks prior to the independent work time. Data was collected through spelling tests on the sound of the week, each week for 6 weeks. The findings of this study show that brain breaks had a positive impact on the achievements of the students who were exposed to them, as opposed to those who were not exposed to brain breaks.

CHAPTER I

INTRODUCTION

The focus of this study was to determine the impact of brain breaks on student achievement. Within some curricula there are chances for children to take “breaks” from learning and have 10 to 15 minutes of movement, not related to the subject or task at hand; these movements are believed to be pertinent to children’s success in today’s educational world. These brain breaks were placed in the Anne Arundel County Public Schools’ curriculum in 2015; this was the first time that brain breaks were part of the instructional day.

The brain breaks given to the students in this study took place prior to the daily guided reading rotations. The movements were used to give the children a break from learning and the structured routines of the school day. The students in this study were asked to work independently for 45 minutes during the reading rotation time, which is a long time for elementary aged children. These movements ensure students are exercising every day and getting their minds ready for the next task; therefore, it was worth investigating their impact. According to Raney, Henriksen, and Minton (2017), many studies show a positive correlation between daily physical activity and behavior and academic achievement.

Statement of Problem

The issue in question is the extent to which brain breaks impact student achievement. All elementary aged students in Anne Arundel County Public Schools experience brain breaks as they are incorporated into the daily schedule and routines. According to *Time for a Brain Break!* “Brain breaks are quick, whole-class activities that give students opportunities to pause, move, and interact in safe, structured ways” (2016, p. 1). During the guided reading time of the day, students work independently, as well as in a small group with the teacher. There are times that

the students are off task and do not complete their work on time, which could be due to lack of focus and motivation. Implementing the brain breaks prior to the guided reading time is a strategy to determine whether exercise and movement can solve the problems related to focus and motivation, which directly impact achievement. A problem associated with students not finishing their work on time is that there is not another time during the day to finish it; therefore, it needs to be done within the amount of time allotted. Brain breaks are believed to combat this issue by maximizing student focus and time on task.

“As early childhood professionals we have a duty to educate the whole (thinking, feeling, moving) child” (Pica, 2006, p. 12). It is important that as teachers we get the child’s body moving and in turn, we will get the child’s brain moving as well. *Time for a Brain Break!* states, students’ cognitive abilities strengthen as they form mental pictures, make quick decisions, or follow motion or word patterns. And every brain break involves movement, which stimulates brain cells in ways that further promote learning. Movement also helps students release excess energy and ease physical tension. (2016, p. 1)

Therefore, giving children brain breaks should in turn strengthen their academic abilities. No matter what the movement is, whether guided or not, students are making decisions while moving; they are learning how to use their brains and bodies to express themselves and get their energy out.

Hypothesis

The null hypothesis was that brain breaks have no impact on student achievement, as measured by weekly assessments. The alternative hypothesis was that brain breaks have a positive impact on student achievement, as measured by weekly assessments.

Operational Definitions

The independent variable in this study was the brain breaks provided to the students via GoNoodle. This website is a county approved website containing guided and freestyle dances for children; as each video is 1 to 3 minutes, the students were provided with multiple videos a day to ensure 10 minutes of brain break time.

The dependent variable in this study was the academic achievement of the students in the first-grade class. This was measured by an assessment at the end of each week on the sound of the week, which in this case was a vowel digraph.

Additional keywords that were used within this study are brain breaks, student achievement, time-on-task, and ELLs.

Brain Breaks

The term “brain breaks” refers to the movement time prior to the guided reading rotations. The brain breaks given during this action research were from GoNoodle and were a combination of guided movements, free dance, and mindfulness movements.

Student Achievement

“Student achievement” refers to the overall student performance during the guided reading rotations, as there are many factors that go into student achievement. As the children were assessed at each week’s end, it was determined whether or not each student was able to achieve the goal on the assessment.

English Language Learner (ELL)

Lastly, within this classroom there are 16 “ELLs.” This term stands for “English language learner.” It is important to remember that these students are still in the process of learning the English language.

CHAPTER II

LITERATURE REVIEW

Introduction

This literature review shows the importance of brain breaks and why researchers have established the effectiveness of them. The first section of this review will explain what impacts student achievement. The second section of this review will address the stressors of children. Additionally, this review will explain different types of brain breaks and furthermore, the use of brain breaks on a daily basis. Lastly, this section will explain using brain breaks within curriculum.

What impacts student achievement?

There are many factors that impact student achievement, at many different ages. Homelife and school-life are very large contributors to student achievement. At home, children may deal with issues related to family structure, socioeconomic status, stress level, and relationships. At school, children may deal with classroom structure, their teacher, motivation, wellness, attendance, and relationships. It is a challenge for teachers to implement interventions to help students learn when dealing with such issues.

All families have a different structure; there could be a blended family, a divorced family, traditional family, or even a single-parent family. All of the types of family structure weigh differently on a child and all types of family impact the student's achievement negatively or positively. Along with family structure, socioeconomic status has an impact on student achievement. Socioeconomic status is "a combination of education, income, and occupation" (Lumpkin, 2016, p. 171). Based on that definition, if the parents have a low socioeconomic status, their child may also suffer from the lack of experiences due to income, lack of

background knowledge built due to parents' education, and lack of parental guidance due to some types of occupation or occupation hours. Socioeconomic status and family structure can also contribute to the stress level of a child. Poverty and marital statuses can also influence student achievement. Jones, Wilson, Clark, and Dunham (2018) note that "Classrooms are filled with children from broken homes with some parents having been married and divorced more than once causing stress and confusion for the child" (p. 65). The more difficult the lives are for the parents, the more stress that is put on the child. Lastly, relationships can take a toll on a child's academic achievement as well. According to Witmer, "it is our connections with our parents, children, spouses, siblings, friends, and teachers that provide us with meaning and genuine learning" (2005, p. 224). If students do not have positive connections with the people around them, they will most likely not succeed. At home, parents need to teach children about building and sustaining relationships prior to their entrance into school. This will help a child to establish and maintain healthy relationships with their peers that can impact achievement.

As well as home structure, schools also impact student achievement. One thing that impacts student achievement is classroom structure. Classroom structure is the overall arrangement of the classroom and how the teacher strategizes the makeup of the class and room. This can include the arrangement of the desks, centers, carpet, rules, classroom jobs, expectations, and even incentives for the children. The teacher also has a large impact on student achievement. It is important for the instructor to understand his or her students, know what they need, and the best way to keep them motivated to learn. Intrinsic and extrinsic motivation both impact student achievement; this is because the student needs to be motivated before they can be motivated by a teacher or parent. Teachers and parents can teach intrinsic motivation by demonstrating or modeling it themselves. Teachers can keep children motivated by using modes

of teaching in which the children are interested, for example, using movement, songs, and games to engage younger learners. “Some [researchers] have argued that self-esteem plays a critical role in children’s academic functioning. According to these researchers, an individual’s having positive regard toward oneself is particularly beneficial for young children” (Bong, Cho, Seon Ahn, & Jin Kim, 2012, p. 338). Self-esteem and motivation go hand-in-hand when learning because of the importance of confidence in impacting the “want” to learn.

Not only do children need to be motivated to learn, they also need to be well and attend school as much as possible. When students are not well, they are neither motivated to learn nor are they able to comprehend what they are learning. If students have poor attendance they are not going to benefit from instruction. One study completed in an Ohio school showed the positive relationship between the building attendance averages and an Ohio Proficiency Test (Roby, 2004).

Lastly, relationships and school climate play large parts in student achievement. Many researchers describe school climate and relationships as “the shared beliefs, values, and attitudes that shape interactions between students and adults and set the parameters of acceptable behavior and norms for the school” (Wang & Degol, 2016, p. 316). Wang and Degol describe school climate as, “the heart and soul of the school. It is about that essence of a school that leads a child, a teacher, and an administrator to love the school and to look forward to being there each school day” (p. 316). Both definitions show the importance of having positive relationships in school in order for children to succeed.

Overall, there are many contributors to student achievement, at home and in school. It is important for parents and teachers to be aware of everything that can impact a student’s achievement and do their best in order for the child to succeed.

Reducing the Negative Impact of Stressors on Achievement

Brain breaks reduce the negative impact of stressors because they give the children a way of expressing themselves, exercising, and keeps their mind off of the stressors. When a child is engaged in a brain break, they are able to be themselves and not have to make decisions that would impact them as harshly as some of the stressors would.

Time for a Break! states, “Brain breaks are quick, whole-class activities that give students opportunities to pause, move, and interact in safe, structured ways” (2016 p. 1). Brain breaks are used within different parts of the school day to ensure students stay on task and to allow them to move around while participating in today’s demanding curricula. In some schools, brain breaks are built into the curriculum and in some teachers have to incorporate them within transition times or where they see fit. In Anne Arundel County, these are brought into the curriculum through the “Move, Move, Move Block” of the day. The Move, Move, Move block is a 10 to 15 minute block of time to move their bodies and relax their brain. In some cases, they use simple mindfulness movements, in some they are quick moving, and in some there is health and body lessons:

The Move, Move, Move Learning Block recognizes the role of healthy minds, bodies, and movement in the learning process. Although Health Standards are specified throughout the First Grade Curriculum when explicit instruction is targeted, Maryland’s College and Career Readiness/Content Standards (CCRS) are also presented through transdisciplinary activities and connected to instructional themes. Throughout the matrix, select activities that engage students in a variety of ELA, Math, STEM, PE, Social/Emotional and Disciplinary Literacy (Science, Social Studies, and Fine Arts) standards outlined by MSDE for Grade 1. (2014, p. 1)

Brain breaks are important not only for a break within the day, but also to keep children active and to counteract health concerns related to inactivity. “Realizing the seriousness of such health trends, states across the nation are now evaluated on efforts to improve children’s health status and to get children more physically active” (Breslin, Morton & Rudisill, 2008, p. 429). Just as instruction differs from classroom to classroom, school to school, county to county and state to state, so do brain breaks. There are many types of brain breaks, which are intended to help impact student achievement positively. Several are reviewed below.

Types of Brain Breaks

Research describes many types of brain breaks for teachers to incorporate within their classrooms and schools; some are class based and some are school-wide:

New recommendations from such groups as the Centers for Disease Control, the National Institutes of Health, NASPE, and the American Heart Association recommend 10- to 15-minute "bouts" of at least moderate-intensity physical activity, adding up to 30 minutes, on most or all days of the week. (Pica, 2006, p. 15-16)

It is important that educators incorporate physical fitness, and brain breaks, into their daily routines to accumulate these minutes. Pica also recommends doing spurts of brain breaks during transitions, such as tiptoeing, hopping, skipping, or jogging, to promote movement and interest.

Another type of brain break is one that is school-wide. An example is the Walking Classroom. “The Walking Classroom (TWC) program provides a structured classroom physical activity (PA) break that incorporates academic content” (Stoepker, Dauenhauer, & McCall, 2018, p. 498). A school in the western United States used this program to increase physical

activity within the school. Students take a brisk 20-minute walk, while listening to a kid-friendly podcast that comes preloaded. The Walking Classroom program used podcasts aligned with Common Core Standards and was shown/designed to help students retain information while walking and listening to the podcast. This is a beneficial type of brain break because it gets the students walking, but is also gives them a chance to learn as well. In conclusion, the study showed that TWC had a positive effect on on-task behavior, which increased by 7.5% for the entire school.

Additional types of brain breaks include video brain breaks, mindfulness brain breaks, and guided dancing brain breaks. Video brain breaks help children take their minds off of learning. Mindfulness brain breaks, such as yoga, help students regain control of their minds and bodies. They have been shown to help with stressors discussed earlier in this review. Khalsa and Butzer, suggest that there has been a higher interest in yoga-based interventions in schools (2016). Lastly, guided dancing brain breaks, help students with motor skills, hand-eye coordination, and overall movement. The guided dancing brain breaks keep students engaged and motivated, which in turn helps keep energy levels up.

Using Brain Breaks on a Daily Basis

In Raney et al. research, they found that academic achievement is higher when the lesson includes physical movement (2017). It is important for teachers of young children to incorporate movement daily, in order to keep their energy and motivation up. Additionally, many studies show a positive correlation between daily physical activity and behavior and academic achievement. Lastly, repetition of anything is beneficial for children; therefore, incorporating physical activity into daily routines is helpful.

When designing instruction including brain breaks, teachers need to ensure that all needs are being met. Children with intellectual disabilities need to be accounted for and included as well. A study was done in 2012 to determine the effects of physical activity in the classroom on academic progress of children with intellectual disabilities. During the study, the students' life skills (special education) classroom teacher engaged the students in a "daily structured physical activity lesson...prior to academic work" (Everhart, Dimon, Stone, Desmond & Casilio, 2012, p. 301). Additionally, "teachers in which, both classrooms commented that their students appeared to be focused more on classwork following the physical activity sessions" (p. 301). These results suggest that with repetition of physical activity on a daily basis, children with or without intellectual disabilities can improve in academics and behavior.

Fitting Brain Breaks into the Curriculum

Research has shown that children need movement in order to stay focused on academics; therefore, most, districts and counties have infused movement into the curriculum. According to Phillips, Meister, Johns, Bears, and Hamm (2016),

currently, one of the largest national public health concerns is the number of children living a sedentary lifestyle. Many children are participating in inadequate amounts of physical activity and have a high caloric intake, which are behaviors indicative of future health concerns. To combat this, physical activity interventions are being implemented in the school setting. (p. 59)

Due to the health concerns in the United States, prior to fusing brain breaks into curricula, studies were done to ensure the stability, reliability, and validity of them within the classroom. Within many schools and classrooms, brain breaks or some type of physical movement is incorporated through curriculum. Implementing the physical activity curriculum means that the

teacher is responsible for ‘setting the stage’ by helping children develop the foundation they need to grow up and be healthy minded, responsible adults (Breslin, et al. 2008) just as they do with academics. It is important for educators and administrators to demonstrate a healthy lifestyle and a “want” for wellness for the children. This will show them the importance of exercising and being well.

Research states that not only should educators demonstrate wellness and activity; they should participate in brain breaks, too. A Wellness Week is one way to show students how adults stay healthy and to show them ways for them to be healthy. “A Wellness Week is a one-week period during which the whole school focuses on physical activity and sound nutrition” (Corbin, Kulinna, Dean & Reeves, 2013, p. 36). This week is incorporated within the school’s curriculum and involves staff, parents, community members, and children. The event can be publicized throughout school with posters, students can learn about brain breaks they can do in classrooms and discussions on exercise and healthy eating take place during Physical Education. Getting the entire school and community population involved in a Wellness Week is a positive way to validate responsibility for self, healthiness, and drive, which can impact learning and coping skills.

Lastly, some classroom teachers feel as though they are becoming Physical Education (PE) teachers when they are asked to incorporate brain breaks within their curriculum, but this is not the case. Classroom teachers are continuing to encourage activity as PE teachers do. A study was done of student teachers to examine the beliefs about teaching physical education and implementing physical activity in a daily routine, of people in school to become classroom teachers (Linker & Woods, 2018). Results show “PCTs strongly indicated that they are not willing to teach physical education lessons as future teachers. They are very willing, however, to

incorporate physical activity into their classrooms” (p. 77). This suggests that teachers are willing to incorporate physical activity when it is provided in their training curricula.

Encouraging teachers to use brain breaks may require a paradigm shift from thinking teaching is merely passing on content to realizing it requires engineering the classroom and lessons to ensure children are alert and receptive to content.

Conclusion

Overall, brain breaks have been shown to positively impact student achievement. Research shows that the sedentary lifestyle of children does not help them with behavior or academic achievement; therefore, it is important to incorporate brain breaks by way of physical activities within their daily schedule in school. When students engage in a physical, healthy lifestyle, their on-task behavior increases, which in turn increases their achievement. There are many factors that impede and contribute to student achievement, at home and at school, but teachers can provide simple brain breaks to promote physical activity, which promote student achievement in the face of some of those negative factors, which are very common. Finally, there are many types of brain breaks, and most schools are incorporating them within their curriculum. Research is needed to determine which works best and are most efficient and enjoyable for various student populations.

CHAPTER III

METHODS

The purpose of this study was to determine the effects of brain breaks on the achievement of first-grade students. More specifically, the researcher employed an experimental research design. The subsequent sections in this chapter will provide the reader with details relating to the study's design, participants, instrument, and procedures.

Design

The researcher used an experimental design for this study. The participants were purposely chosen as a class of first-grade students. The students were randomly assigned to receive or not receive brain breaks prior to Guided Reading. Students in the experimental group were given a 10-minute brain break prior to working independently throughout the week. Students in the control group were not given a 10-minute brain break prior to working independently throughout the week.

The independent variable was the 10-minute brain break given to the experimental group and the dependent variable was the student performance on the weekly assessment, which focused on the “sound of the week.” During the Guided Reading block, students were charged with the task of working independently on various activities that dealt with the sound of the week. These activities included word work activities, sentence activities, writing, and kinesthetic activities. At the end of the week, the students were given an assessment to determine their own knowledge of the sounds and if students could use these sounds correctly.

The baseline data was a test of knowledge of the vowel digraphs, or sounds of the week, that were coming up within the following 6 weeks. The baseline was given to determine whether the children knew the vowel digraphs prior to the lessons, then was compared to the posttest. The

vowel digraphs tested were, /ee/, /oa/, /oi/, /oy/, /ow/, /ai/. At the end of each week, the students were given a spelling assessment on 10 words using the sound of the week.

Participants

This study seeks to determine if brain breaks impacted the performance of a first-grade classroom of 17 students. This class was in a Title I school, has 95% Hispanic background, and over 80% Free and Reduced Meals (FARMS). The students in this class were asked, every day during guided reading rotations, to work independently for 45 minutes. During two rotations, they worked on words with the sound of the week. During one of the four rotations, they worked with the teacher and were asked to read a book, as well as answer comprehension questions. The long periods of working independently can take a toll on children's motivation, focus, and behavior, which in turn impacts some students' ability to learn. Therefore, the brain breaks were placed prior to the reading block to determine the impact on student achievement. The randomly assigned groups consisted of 10 children in the experimental group and 7 children in the control group.

A random name generator was used to randomize group assignment, thus creating an experimental group and a control group. Within the experimental group, there were six boys and four girls. All students in the experimental group were Hispanic and range from 6 to 7 years old. Within the control group, there were three boys and four girls. In the control group there were six Hispanic children and one African American boy; these ages also range from 6 to 7 years old.

Instrument

The instrument used to measure the students' performance was a spelling assessment created by the researcher (see Appendix). It consisted of 10 words and was given on the last school day of each week. The purpose for the tests were to assess the knowledge of the vowel

digraphs and to determine whether the brain breaks taken throughout the week improved students' ability to learn. The students were given one point for having the correct vowel digraph (sound of the week) within the word and one point for the vowel digraphs being in the correct place within the word, i.e. the beginning, middle, or end. An example would be the word, "feet." If the child spelled "feet" with two "e"s, he or she earned one point. If the child knew that the /ee/ belonged in the middle of the word, he or she earned another point. This makes a total of 20 points per test.

Procedure

The procedure of this Action Research included a pretest, an intervention, and a posttest. The pretest was given before teaching the vowel digraphs. The intervention was the actual brain breaks given to the children in the experimental group. The posttest was given at the end of each week to determine the students' knowledge of the vowel digraphs.

Pretest

Prior to teaching the six sounds being taught within 6 weeks, the students were given a pre-assessment to determine their knowledge of the sounds /ee/, /oa/, /oi/, /oy/, /ow/, /ai/ within words. The pre-assessment given by the teacher consisted of saying the word, using the word in a sentence, and then stating the word again. Each sound was given one time. After the pre-assessment, the teacher started teaching the first sound, /ee/.

Intervention

Within the first-grade class, the students were randomly divided into two groups, the experimental group and the control group, using a random name generator. The students in the experimental group were given a 10-minute brain break, daily, prior to the independent work

time, where they were to practice the sound of the week. The control group of students was not given brain breaks prior to the independent work time.

Posttest

At the end of each week, all students were given a 10-word spelling test to determine their knowledge of the sound of the week. As with the pretest, each word was said once, used in a sentence, and then said again to the students. The students were given one point for having the correct vowel digraph within the word and one point for the vowel digraphs being in the correct place within the word, i.e. the beginning, middle, or end. The scores were compared to the pretest to determine if they gained knowledge of that specific digraph. Each week, there was a posttest. During the posttest the children were assessed on 10 words using the vowel digraph focused on that week.

CHAPTER IV

RESULTS

This Action Research was done to determine the impact of brain breaks on student achievement. The data below includes tables and figures that illustrate the impact the brain breaks had on the experimental group, how the lack of brain breaks affected the control group of students, and the comparative data for each week. The data shown are the means of each week, along with a pretest mean and a cumulative post-assessment means.

Experimental Group

Shown in Table 1 are the weekly means of all the students in the experimental group. This group was chosen randomly and included 10 students. Students' improvement can be seen between the pretest and the 6 weekly assessments. The cumulative mean of 19.05 out of 20 is a representation of how the students scored through all six of the post-assessments.

Table 1

Experimental Group Weekly Means

	N	Pretest	Week1	Week2	Week3	Week4	Week5	Week6	Cumulative Mean
Experimental Group Means	10	5.6	18.5	19.9	19.7	19.8	17.8	18.6	19.05

Shown in Figure 1 are the means of the weekly scores shown above, but in a graph form.

This group was given 10-minute brain breaks prior to the lessons and independent work throughout the week. The scores range from 5.6 to 19.9 out of 20.

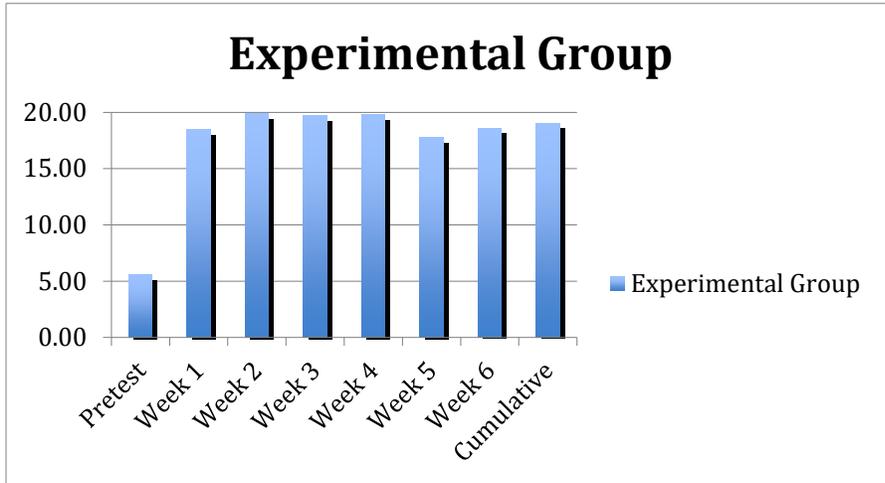


Figure 1. Experimental Group Weekly Means Bar Graph

Control Group

Shown in Table 2 are the weekly means of all the students in the control group. This group was chosen randomly and included seven students. The cumulative mean of 10.87 out of 20 is a representation of how the students scored through all six of the post-assessments.

Table 2

Control Group Weekly Means

	N	Pretest	Week1	Week2	Week3	Week4	Week5	Week6	Cumulative Mean
Control Group Means	7	2.6	12	8.6	13.1	11.4	9.7	10.4	10.87

Shown in Figure 2 are the means of the weekly scores shown above, but in graph form.

The data ranges from 2.6 to 13.1 between the pretest, the weekly tests, and the cumulative score.

This group was not given brain breaks prior to the lessons and independent work.

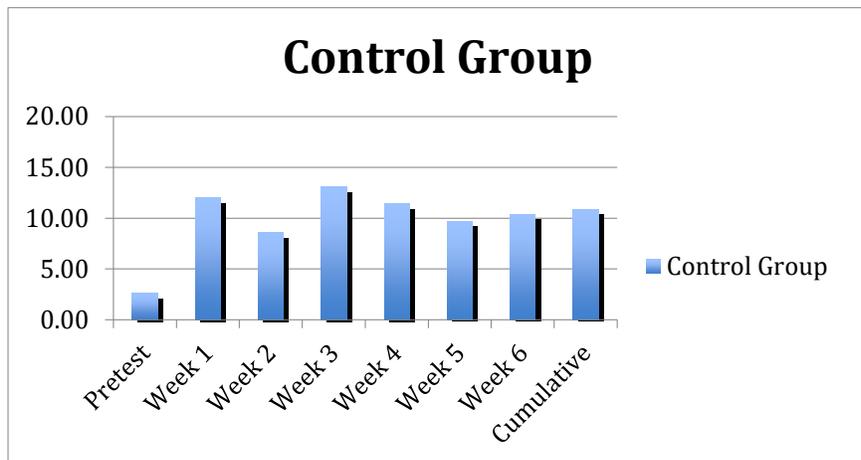


Figure 2. Control Group Weekly Means Bar Graph

Comparison

Shown in Figure 3 are the weekly means of the experimental group and control group. In this graph, it displays both means side-by-side to demonstrate the similarities and differences between the groups. The difference between the cumulative mean scores was 8.18.

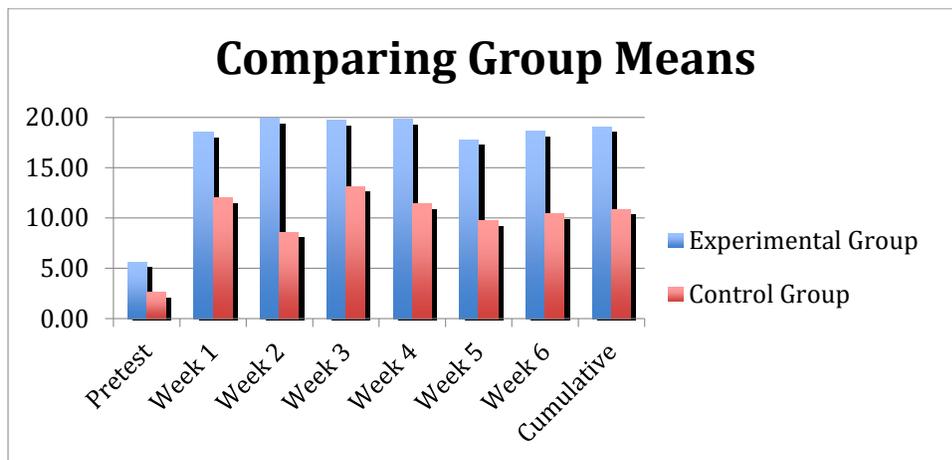


Figure 3. Comparison of Weekly Means

Summary

Within this chapter, the results of this Action Research were displayed through tables and figures. These results were for both the control group and experimental group independently and comparatively. Within the next chapter, the interpretation and implications of the results will be discussed.

CHAPTER V

DISCUSSION

This study was done using an experimental group and a control group. Pre-assessments and post-assessments were used to determine whether or not brain breaks had an impact on student achievement, and it was completed with a first-grade group of students. The results from this study provide support for the alternative hypothesis, which stated brain breaks would impact student achievement. The brain breaks did have a positive impact on student achievement on these first-grade students.

Implications of Results

Within this study, the experimental group of children scored an average of 19.05 on the weekly assessments. The control group of children scored an average of 10.87 on the weekly assessments. This 8.18 difference demonstrates how much the brain breaks impacted the students learning. The results of the pre-assessment showed the experimental group scored an average of 5.6 and a cumulative average of 19.05 on the post-assessments; or a 13.45 difference. Additionally, the results of the control group showed a difference of 8.27 when comparing the pre-assessment, 2.6, to the cumulative mean of the post-assessments, 10.87. Although the students in the control group continuously scored higher on the assessments than on the pre-test, they did not score as high as the experimental group. This is important to notice that they did learn the sound throughout the week but did not nearly perfect the sound as the experimental group did.

Due to the results showing that the brain breaks positively impacted the students, from that point forward, all students in the first-grade class were given brain breaks prior to the Guided Reading time within the day, after this study was completed. Using brain breaks

throughout the day will continue to help students refocus their attention to the task at hand and not become overwhelmed by academics. From this study, the researcher recommends starting the day with brain breaks to get the children's brains ready for the day and before a pertinent block of time, such as Guided Reading and math.

Theoretical Consequences

Although children of all ages are encouraged to exercise daily and be free to express themselves, this is not always the case. Research shows that children learn from one another, reach higher goals when exposed to exercise and movement, and can learn better after being exposed to these movements (Everhart, et al. 2012). It is important for parents and educators to allow the children the freedom to move and have a break from daunting tasks, like independent work. Children in elementary schools are asked to do more within the day than ever before. They are asked to learn with a "bell to bell" schedule, get along with classmates, participate, earn honor roll, work in groups, know how to use technology, as well as to have fun while juggling tasks. The brain breaks given to these students were a time to let them have a break from everything else throughout the day. This theory supports prior research stating that brain breaks positively impact student achievement, which also aligns to this study (Breslin, et al. 2008).

Threats of Validity

Internal Validity

There were multiple threats to the validity of this study. The first threat is the types of brain breaks given to the students. Not every school district has access to the GoNoodle as this school did, and not every brain break was the same throughout the week. There was no way to tell whether the guided movements or the freestyle dancing impacted the results. Additionally,

this study was done for only 6 weeks out of the school year and was only with first-grade students. Lastly, the researcher created the assessments; therefore, the results could be distorted.

External Validity

An external threat to the validity of this study is the population of the class. This class was a highly active, high Hispanic population, low socio-economic, low-performing class. It is not to say whether or not it would work with different population, but a researcher may not have the same results because of population differences throughout school systems. This study cannot be generalized for all elementary aged children.

Connections to Previous Studies

As stated previously, there is a good amount of research that shows the importance of exercise and brain breaks throughout a child's day. Not only do brain breaks reduce the impact stressors have on children, but they also give the children the freedom to express themselves through movement. Additionally, it is important that when a teacher is planning on implementing the brain breaks within the classroom, all needs of the children need to be met. The brain break needs to be able to be done by all and positively affect the children, as it did in this study. As Everhart, et al., (2012) stated, the students need "daily structured physical activity lesson...prior to academic work" (p. 301). The academic work the 6 to 7-year-olds are asked to complete becomes more and more challenging and independent as the year progresses, so it is important for the educator to give the students the tools they need in order to focus and learn whatever the children are being asked to do.

Also, Raney et al. expresses the importance of physical movement throughout the school day to keep energy and focus up (2017). Many studies, like TWC and this study showed a

positive impact on student achievement after being exposed to movement and physical activity (Stoepker, et al., 2018).

Implications for Future Research

Future studies can build on the methodology employed in this study and eliminate certain threats to the validity of this study. Future research may include certain types of brain breaks versus others, measuring the time on task of students, completing the study with a larger group of students and over a longer period of time, as well as using a researched based tool designed to measure student achievement.

Researching guided versus freestyle brain breaks may be a determining factor as to if a teacher should use one instead of another. Measuring the time on task of students may lead to a better understanding of what impact the brain breaks had on the focus vs. the actual learning. Additionally, further research on the size of group, ages of group, and amount of time for the study may determine that certain brain breaks can work for certain children and the longer time in the study may demonstrate different results. Lastly, because the researcher created the tool to assess the children, using a tool that has shown validity, would be worth investigating to determine whether or not the testing tool had an impact on the students' achievement as well.

Conclusions/Summary

From this study it could be concluded that brain breaks do have a positive impact on student achievement, within the class tested. Through the post-assessments and cumulative means, one can determine that having brain breaks in class will positively impact the achievement of the students.

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Appendix

I.

Spelling Tests

Pretes	Vowel	Correct	Wee	Vowel	Correct	Wee	Vowel	Correct
t	Digrap	placemen	k 1	Digrap	placemen	k 2	Digrap	placemen
	h	t	/ee/	h	t	/oa/	h	t
feet			feet			boat		
boat			meet			coat		
foil			seed			float		
boy			deep			bloat		
bow			keep			loan		
toe			sheep			soap		
tail			sheet			toast		
lay			whee l			goal		
light			peep			coal		
	/9	/9	need			coach		
				/10	/10		/10	/10

Week 3	/oi/	Vowel Digraph	Correct placement	Week 4	/oy/	Vowel Digraph	Correct placement	Week 5	/ow/	Vowel Digraph	Correct placement
		h	t			h	t			h	t
boil				boy				bow			
foil				toy				glow			
soil				joy				row			
spoil				enjoy				elbow			
coin				royal				meadow			
join				oyster				shadow			
void				decoy				window			
voice				coy				snow			
toilet				annoy				borrow			
poison				ahoy				swallow			
		/10	/10			/10	/10			/10	/10

Week 6	Vowel	Correct
/ai/	Digraph	placement
tail		
mail		
main		
wait		
stain		
paint		
aid		
sail		
faint		
snail		
	/10	/10