

Running Head: Stability Balls vs. Chairs

STABILITY BALLS VS. CHAIRS AND THEIR EFFECT ON READING

COMPREHENSION

By

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Submitted to

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Submitted in Fulfillment for the Requirements for

61-683 Research Paper

Summer 2013

April 18, 2014

## ABSTRACT

The purpose of this study was to identify if using stability balls rather than chairs effected academic performance in the area of reading comprehension. This study was done over the course of a six week period. The data was collected in a second grade classroom in rural northwest Missouri. There were seventeen students that participated in the study. Students rotated their seats weekly by sitting one week on stability balls, and the next week on the chairs. At the end of each week, the students took a reading comprehension test with nine questions. After six weeks of testing, the data was assessed. The results at the conclusion of the study were that there was no significant difference between students' test scores when sitting on stability balls, versus chairs. If future studies are done, it would be helpful to do the study for a longer period of time rather than only six weeks. Also, having the students sit on their seat, for a longer period than one week (whether it is on the stability ball or chair), might show a greater difference on reading comprehension scores.

## INTRODUCTION

### *Background, issues, and concerns.*

Most schools use chairs at desks for their students to sit in. Recently, some schools and teachers have chosen to use stability balls, also known as yoga balls, for their students to sit on. Teachers have started to use stability balls in their classroom because of some of their research based benefits such as improved focus and attention, better posture, better handwriting, the ability to allow students to move without interrupting others, and strengthening core muscles. Some people are skeptical of the use of stability balls as they are concerned that they will be misused by the students and cause a classroom management problem. Another issue with the use of stability balls is the cost to purchase them. Most schools do not have abundant funds and have to be conscience of how they use their money. Finally, it can be possible that parents and/or students will not buy into the use of stability balls as chairs.

### *Practice under investigation.*

The practice under investigation is whether students sitting on stability balls compared to chairs will increase reading comprehension.

### *School policy to be informed by study.*

The school practice that will be addressed by this study is the use of stability balls as classroom chairs. Currently, most schools use chairs for their students to sit in. This study will compare the reading comprehension of second grade students sitting in chairs and on stability balls.

*Conceptual underpinning.*

Everyone has experienced times during reading when they have struggled to remember what they read. People tend to wiggle in their chairs, doodle, and various other activities in order to keep themselves focused on what they are reading. The use of stability balls as chairs in classrooms has been shown to help improve focus during class for some students. It allows students to move and wiggle while working on an assignment, such as reading a book. Some teachers have opted to have their students sit on stability balls rather than chairs in their classrooms to help students stay on task. In theory, the use of stability balls will help students to be able to focus on what they are reading and therefore improve their reading comprehension.

*Statement of the problem.*

The problem is to determine which seating arrangement is more beneficial to students' reading comprehension; chairs or stability balls.

*Purpose of the study.*

The purpose of this study is to identify if using stability balls rather than chairs effects academic performance in the area of reading comprehension.

*Research questions.*

RQ#1: Is there a difference in academic performance in the area of reading comprehension when students sit on a stability ball rather than a chair?

*Null hypothesis.*

There is no difference in academic performance in the area of reading comprehension when students sit on a stability ball rather than a chair.

*Anticipated benefits of the study.*

If there is a difference between academic performance in the area of reading comprehension when students sit on stability balls, teachers should consider having stability balls in their classrooms for students to sit on.

*Definition of terms.*

Stability ball – a plastic ball, typically used for exercising, which can also be used as a chair. Also known as exercise balls, Swiss balls, balance balls, fitness balls, or workout balls.

*Summary.*

This study will compare whether students have better reading comprehension while sitting in a chair versus a stability ball. The students will be sitting in a chair one week and a stability ball the following week for a total of six weeks. The students will take a weekly reading comprehension test. In conclusion, the scores will be compared to see if there is a significant difference between when students sit in a chair, or on the stability ball. Based on the results, teachers can begin to discuss if the use of stability balls in their classroom would help their students' reading comprehension.

## REVIEW OF LITERATURE

Kennedy (2009) made valid points when he stated, “Just as instruction has evolved to embrace the different ways students learn, classroom furniture also must change. Rigid rows of standard desks with attached chairs aren’t necessarily the most effective method of engaging students, especially if children are confined to those desks for hours on end.”(p. 1) The only seating option available to students in the classroom setting for years has been traditional chairs. In recent years, there has been a shift with some educators to try using stability balls in their classrooms. The use of stability balls within the classroom is still not common practice, but it is gaining momentum.

“The balls first began to surface in schools as aids for kids with attention problems or autism, said Michelle Rowe, executive director of the Kinney Center for Autism at Saint Joseph’s University in Philadelphia.” (Matheson, 2013, para. 9). One study conducted by Fedewa and Erwin (2011) was to identify how stability balls effected on-task and in-seat behavior for students with attention and hyperactivity concern. The study was done over the course of twelve weeks and used momentary time sampling in which eight students were observed. The results of the students showed that the in-seat average went from 45 percent to 94 percent and on-task behavior went from 10 percent to 80 percent. The researchers also asked teachers to assess all of their students, even those without attention and hyperactivity concerns, during the duration of the study. Teachers noted that these students also saw their scores drop on the assessment. Lower scores on the assessment meant that the student did not have attention and hyperactive problems. The teachers in this study shared their thoughts on the use of stability balls within their classroom. “A common theme regarding social validity among teachers was their

satisfaction with the stability balls in helping their students “calm down” by providing them “activity breaks on the balls” (Fedewa, 2011, p. 397).

Another study performed with students with attention deficit hyperactivity disorder focused on the in-seat behavior as well as legible word productivity (Schilling, 2003). The researchers observed three fourth grade students using momentary time sampling. They collected data on the in-seat behavior and five writing samples and compared them. Through their data collection and analysis, the researchers were able to identify that the students did increase their in-seat behavior and their legible word productivity. Again in this study, students without attention deficit hyperactivity disorder also sat on stability balls. The teacher of this particular classroom commented, “Although students are bouncing, they are more focused on what I am saying,” (Schilling, 2003, p. 43). At the conclusion of the study, the teacher continued to use the stability balls for the students with attention deficit hyperactivity disorder and ordered more stability balls for the other students in his/her classroom. These two studies show why there has been a shift to use stability balls for all students and not just students with attention and hyperactivity concerns.

Robbi Giuliano, a fifth grade teacher, stated that the switch from chairs to stability balls was one of the best decisions she ever made in her eleven years of teaching (Matheson, 2013). Teachers like Giuliano are making the switch from chairs to stability balls because they are finding that their students are more focused and are able to focus their attention move on to what they are learning. “I have more attentive children; I’m able to get a lot done with them because they’re sitting on yoga balls,” Guilano stated (Matheson, 2013, para. 3).

Several studies have been done to test the theory of whether sitting on stability balls actually helps all students to focus better. One study was done at Grand Valley University with four lecture classes. Kilbourne (2009) wanted to identify if students would have a positive experience sitting on exercise balls. Kilbourne collected both quantitative data through questionnaires, and qualitative data through students comments. At the end of the college course, the students answered questions about their ability to pay attention, concentrate, take notes, engage in classroom discussions, take exams, maintain upright posture, and engage the lower body (Kilbourne, 2009). Students were given a scale from one to five, with five being positive and one being negative. Every question had a mean of four or higher. Kilbourne (2009) also asked students, if they were given a chance to use an exercise ball as a seat in another class at Grand Valley State University, would they want to. Out of the fifteen-two students participating, fifty-one students said yes. In the case of Kilbourne's study, the students found sitting on the stability balls helped improve their attention span.

The use of the stability balls within classrooms has been proven to help students with attention problems as well as those without. One study, done by Kercood and Bandad (2012), focused on physical activity during a listening comprehension task for students with and without attention problems. This particular study allowed students to doodle and/or sit on stability balls while doing a listening comprehension task. Three of the four students had attention problems. At the conclusion of the study, "Three of the four students reported that they preferred doodling during the task, all of them stated that sitting on the exercise ball forced them to stay awake and pay attention." (Kercood, 2012, p. 29).



Improving students' ability to pay attention is not the only benefit of using stability balls in the classroom. Roland (2013) wrote, "The balls aren't used for fun, but rather to help students sit up straight and engage the muscles and the parts of their brains needed to remain balanced on a large ball." (para. 1). Roland also points out that using stability balls keeps the brain engaged. "When students sit on stability balls, both sides of their brains are engaged in keeping their bodies center on the balls. And when the brain is stimulated, it's more focused on learning." (Roland, 2013, para. 2). Kennedy, (2004) also stated, "Some studies have indicated that sitting on the exercise balls help students stay seated longer and helps them concentrate more effectively on their studies (p. 4 ).

Other benefits can be found, in Learning in Motion: Using the Stability Ball as a Chair – A Teacher's Manual. This manual was created by Lisa Witt from WittFitt LLC. Witt was previously a classroom teacher that identified the benefits of using stability balls in the classroom and then started a company producing stability balls. In Witt's teaching manual, there are multiple benefits listed. Some of the benefits listed are: "improves posture, improves balance, coordination & flexibility, strengthens "core" muscles, improves blood flow, keeps you alert & focused, allows movement while seated, custom-sized, improves handwriting." (Witt, 2004-2012, p. 39). Witt actually has teachers share these benefits with students when they are going through the six lessons to train students on how to properly use stability balls.

The studies and research covers the benefits of sitting on stability balls and how it helps all students not just students with attention concerns. The benefits of using stability balls include strengthening core muscles, better posture, and better handwriting.

However, the main benefit that is connected with this study is the improvement of focus and attention when sitting on stability balls. With all this research pointing to student's ability to pay better attention while being seated on stability balls, it leads educators to believe that the hypothesis being tested in this study is true. Students academic achievement will improve if students are seated on stability balls versus conventional chairs.

## RESEARCH METHODS

### *Research design.*

The focus of this study is to identify which type of seat is the most beneficial for students to improve their reading comprehension; a stability ball or a chair. The independent variables are the status of the student and what they are sitting on; stability ball or chair. The dependent variable is the reading comprehension test scores.

### *Study group description.*

The study will be taking place in the second grade classroom of a private Catholic school in the rural Midwest. The second grade class is made up of eighteen students. The class consists of eleven boys and seven girls. However, one student (a girl) moved to the school during the study, therefore this student's reading comprehension scores will not be used in the study.

### *Data collection and instrumentation.*

Each week the students will be taking a reading comprehension test from the Treasures reading series published by McGraw-Hill. The test consists of nine multiple choice questions and one short essay question. For this study, the essay question will be excluded from the results. Only the nine multiple choice questions will be used for data collection.

### *Statistical analysis methods.*

There will be a descriptive analysis used for this study. There will also be a t-test used to analyze the reading comprehension test scores.

## Findings

A t-test was conducted to decipher whether there was a difference in academic performance in reading comprehension when students sit on stability balls rather than chairs. The following charts depict the organized data and findings based on that same data collected in the fall of 2014 from a second grade class in northwest Missouri. The data was collected over a six week time period. The students rotated from the stability balls to the chairs every week. There were nine questions on each assessment that students took. The score listed in Figure 1, is the students' score out of nine points possible.

Figure 1

### Test Scores for seventeen students participating in study.

<b>Student Number</b>	<b>Ball</b>	<b>Chair</b>	<b>Ball</b>	<b>Chair</b>	<b>Ball</b>	<b>Chair</b>
<b>1</b>	5	6	6	9	9	8
<b>2</b>	9	7	9	8	7	8
<b>3</b>	9	9	8	9	9	8
<b>4</b>	7	6	7	8	9	9
<b>5</b>	8	7	8	8	8	8
<b>6</b>	9	6	7	8	9	7
<b>7</b>	8	7	7	5	8	8
<b>8</b>	6	8	7	8	8	9
<b>9</b>	6	9	7	8	6	7
<b>10</b>	9	9	8	9	9	9
<b>11</b>	5	4	7	6	7	7
<b>12</b>	9	8	7	9	8	8
<b>13</b>	9	8	6	9	9	8
<b>14</b>	8	9	9	9	9	7
<b>15</b>	9	7	8	8	8	8
<b>16</b>	9	8	9	9	8	9
<b>17</b>	8	7	7	8	9	8

Figure 2

**t-Test Analysis Results for stability ball vs. chair use for reading comprehension**

Source	Mean	Mean D	<i>t</i> -Test	df	<i>p</i> -value
Stability Balls	7.84314				
Chairs	7.82353	0.0196978	0.0867893	100	0.931913

Note: Significant when  $p \leq 0.25$

The table above is a t-test analysis comparing reading comprehension scores of students while seated on stability balls and chairs. The independent variable are the stability balls and chairs. The dependent variable is the reading comprehension test scores. There were 17 students involved in this study. The mean for students when sitting on stability balls is 7.84314. The mean for students when sitting on chairs is 7.82353. The difference between the means is 0.0196978. The t-test was 0.0867893. The degree of freedom is 100.

The null hypothesis was: There is no difference in academic performance in the area of reading comprehension when students sit on a stability ball rather than a chair. The null hypothesis is not rejected because the p-value was 0.931913 which is greater than the alpha value of 0.25.

## Conclusions and Recommendations

The conceptual underpinning of this study included that previous studies have concluded that using stability balls can help improve students' focus and ability to pay better attention. Based on this information a hypothesis was created that academic performance in reading achievement would be improved when students sat on stability balls rather than chairs. After reviewing the data, it was concluded that there is no significant difference in academic performance in reading comprehension when students are seated on stability balls versus chairs. This study did not confirm the hypothesis created and tested based off of the conceptual underpinning.

Based on the findings of this study there is nothing in the data suggested that the use of the stability balls was detrimental to the students' reading comprehension. The use of stability balls in the classroom did not hurt or help the students in their reading comprehension. It is still beneficial for students to sit on the stability balls to help with the already researched areas of attention, better posture, better handwriting, and improving core muscles. These benefits help to determine that the uses of stability balls are still beneficial, even if this study does not conclude that they help, or deter, academic performance in reading comprehension. Recommending stability ball use within classrooms is still a helpful recommendation simply because of the other research based benefits.

If this study were to be duplicated there are several recommendations to be made that could help to improve the study. One recommendation is to lengthen the time period of the study. This study was only six weeks long. That provides only three weeks of data from students sitting on the stability balls, and three weeks of data from students sitting

on the chairs. It would be beneficial to conduct this study for a longer period of time to see if there was a significant difference in academic performance in reading comprehension for students sitting on stability balls versus chairs. Another recommendation would be to collect data in consecutive weeks, rather than every other week. It is possible that the switching back and forth made it difficult for some students to get comfortable to the new seating arrangement. This also might show a gradual improvement in academic performance while consistently sitting on the stability balls or chairs.

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