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Stability Ball use in the Classroom

Affect on On Task Behaviour and Handwriting

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Abstract

This research paper discusses the use of stability balls in the classroom as chairs and the effect they have on student on task behaviour and on student handwriting. This study examined two elementary school classrooms (grade two and grade three) to see if the stability balls had an impact on student learning. It also discusses teacher and student perceptions about the use of the balls in the classroom.

### Stability Ball as a Tool in the Classroom

This research project has four major components. First, this project will analyze the effects of the stability ball in the classroom on the behaviour of students with and without symptoms of Attention Deficient- Hyper Activity Disorder (ADHD). Second, it will analyze if students write more effectively on stability balls or on the regular classroom chair. The third and four components of this project will discuss student and teacher perceptions of the use of stability balls as chairs in the classroom.

### On Task Behaviour and the Stability Ball

The first question this research project asks is: Within an elementary school setting, is there a relationship between improved “on task” behaviour between students with ADHD symptoms and the use of stability balls as a chair in the classroom?

This question highlights the need to help students with the problems associated with Attention Deficient – Hyper Activity Disorder (ADHD) in a school setting. Research into ADHD has shown that North American society places great value on learning within its school systems and students who do not succeed at this are seen as disadvantaged (Amato-Zech, Hoff, & Doepke, 2006; Bru, 2006; Hartmann, 2003; Lauth, Heubeck, & Mackowiak, 2006; Reid, Trout, & Scharz, 2005; Stahr, Cushing, Lane, & Fox, 2006). Children who have ADHD find school life difficult, they do not have positive experiences, and may develop emotional issues (Bru; Hartmann; Lauth et al.; Stahr et al.). The literature on ADHD estimates that up to 20 million North Americans are affected by this disorder (Alexander-Roberts, 1994; Barkley, 2000; Koplewicz, 1996; Tynan, 2001). Up to ten percent of the student population of North America has this disorder which creates huge costs to the educational systems, family systems, social

systems, and to the self esteem of the children afflicted (Alexander-Roberts; Barkley; Hartmann; Koplewicz; Novelli & Palotta, 2004). Children with ADHD are more likely to drop out of school, suffer from stress or other emotional problems, and are more likely to use narcotics than students who do not have ADHD symptoms (Barkley; Koplewicz; Novelli & Palotta; “Ritalin may have,” 2004).

### *Procedure*

This project evaluated two classrooms – a grade five classroom and a grade two classroom. Each classroom was taped twice during pre and post ball use. The students were taught about the ball use using the Wittfitt program designed by Lisa Witt (Witt, 2001). Lisa Witt’s program is curriculum based and teaches the children the history of the balls and the uses of the balls.

The students were timed for one ten minute interval per taping session. These taping sessions filmed students participating in normal classroom, teacher led learning situations. The sessions that were filmed were started when the class was engaged in the learning experience. This means that the students were not timed while they were preparing for the next lesson.

The taping session singled out 4 students per class. Of the four students that were watched, one student has ADHD symptoms and the other three students were chosen randomly from the rest of their class. In the grade five classroom, the student was on medication for his or her symptoms. In the grade two classroom, the student was not on medication during the initial pre ball taping but, was on medication for ADHD symptoms for the post ball taping sessions. The students were timed for on and off task behaviour as described in the following statement: *On task* behaviour is when students are paying

attention to the teacher, thinking about or doing their work, following instructions, and completing assignments in an appropriate amount of time (Heering & Wilder, 2006; Lauth, Heubeck, & Mackowiak, 2006; Reid, Trout, & Schartz, 2005; Stahr, Cushing, Lane, & Fox, 2006).

### *Results*

#### Ten Minute Timed Learning Experiences

##### Time on Task

Grade and student number	Pre ball taping	Percentage	Pre ball taping	Percentage
Grade two student one – ADHD symptoms	3:07	30%	4:27	47%
Grade two student two	6:20	62%	5:24	52%
Grade two student three	7:14	71%	7:06	70%
Grade two student four	7:06	70%	9:02	90%
Grade five student one – ADHD symptoms	6:53	65%	8:01	80%
Grade five student two	7:38	73%	9:51	95%
Grade five student three	9:35	93%	9:38	93%
Grade five student four	9:19	91%	9:45	94%

Grade and student name	Post ball taping one time on task	Percent of time on task	Pre ball taping two time on task	Percent of time on task
Grade two student one – ADHD symptoms	8:14	81%	6:50	65%
Grade two student two	8:03	80%	8:30	83%
Grade two student three	9:32	93%	8:48	84%
Grade two student four	8:29	82%	8:35	83%
Grade five student one – ADHD symptoms	8:07	80%	8:23	82%
Grade five student two	8:38	83%	8:55	85%
Grade five student three	9:28	92%	9:15	91%
Grade five student four	9:34	93%	9:21	93%

Grade and student name	Average pre ball time on task	Average post ball time on task	Difference between pre and post ball average times	Average grade improvement
Grade two student one – ADHD symptoms	38.5%	73%	+ 34.5%	Grade two: 19.6%
Grade two student two	57%	81.5%	+ 24.5%	
Grade two student three	70.5%	88.5%	+ 18%	
Grade two student four	80%	81.5%	+ 1.5%	
Grade five student one – ADHD symptoms	72.5%	81%	+ 8.5%	Grade five: 1.87%
Grade five student two	84%	84%	0 %	
Grade five student three	93%	91.5%	- 1.5%	
Grade five student four	92.5%	93%	+ 0.5%	

*Discussion*

The data suggests that there was an improvement for students with ADHD symptoms when they use the ball. The student in grade five that was on medication for the pre and post ball filming improved 8.5% in timed on task behaviour. The grade two student results are harder to determine because the student was put on ADHD medication before the post ball filming was done. However, the grade two student with ADHD symptoms had an improvement of 34.5% with the use of medication and the stability ball. We can also surmise that because the other students in the grade two classroom improved after using the balls, that the child with ADHD would have improved because of both interventions. We can also infer that because the child with ADHD symptoms in the grade five classroom improved with the use of the ball, that the grade two student with ADHD would most likely have improved partially because of the balls as well.

The data also suggests that the grade two student's on task behaviour improved for all students with an average improvement of 19.6%. In contrast, the grade five students did not change their behaviour from the use of stability balls except for the student with ADHD symptoms.

#### Handwriting and the Stability Ball in the Classroom

The second part of this project asked the question: Does using the stability ball as a classroom chair help students write better? This question was conceived because literature on the stability ball has suggested that handwriting improves with the use of the stability ball (Santana, 2000; Johnson, 2005; Witt, 2006). Many authors on handwriting believe that there has been a return of emphasis on handwriting in recent years (Handwriting Week, n.d.; Blanchard, 2006; Witt). Handwriting has been de-emphasized

in recent years because of computer technology, however researcher have found that handwriting is still important even with the use computer technology because handwriting still affects student achievement in school (Handwriting Week, n.d.; Blanchard, 2006). Even more importantly, research has shown that handwriting helps develop the areas of the brain that deal with reading and writing in a different way than typing appears to (Handwriting Week, n.d.; Blanchard, 2006). This research indicates that learning proper and effective handwriting skills is still important (Handwriting Week, n.d.; Blanchard, 2006).

### *Procedure*

Students were given two identical handwriting or printing assignments. The first was administered in October of 2006 while the students were sitting on regular classroom chairs. The second was given in January 2007 after the students had been using stability balls as classroom chairs for 2 and one half months. Students were given ten minutes to write. The assignment was deliberately long with the intention that the students would not be able to finish in the time allotted. After the students finished both assignments, the writing samples were evaluated based on the following criteria: 1. Quantity – how many words did the students write during the ten minute period. 2. Quality – five areas of quality were evaluated: legibility, letter formation, alignment, size and spacing. The following are the results of these evaluations:

*Quantity Result Grade Two*



*Discussion of Grade Two Results.*

The grade two students quantity performance had an average of thirty-three percent improvement from the pre and post tests and the student with ADHD symptoms improved by seventy-eight percent between the pre and post both testing experiences. The student with ADHD symptoms, as mentioned earlier, was put on medication for ADHD symptoms after the pre test. Part of the improvement for the student with ADHD symptoms are probably a result of the medications. However, the entire grade two class had a significant improvement between the pre and post tests. This would indicate that at least part of the improvement for the student with ADHD symptoms was probably from the use of stability balls as a chair. From these results one could say that the stability balls have had a positive impact on student quantity production for the grade two class.

*Quantity Grade Five*



*Grade Two Quality Test Results*

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*Discussion Grade Two Quality Results*

The grade two class had an average of 7 percent improvement in quality based on the criteria outlined earlier between the pre and post tests. The student with ADHD symptoms improved thirty-four percent in quality between the two tests. These results for the student with ADHD symptoms are not entirely accurate because of the use of medications for ADHD. However, one can interpret the improvement of the entire class as an indicator that the student with ADHD would have improved without the use of medication. The results of this study would imply that the stability balls have helped the students with the quality of their printing in the grade two class.

*Grade Five Quality Results:*



### *Discussion of Grade Five Results*

The students in grade five had an average of 6 percent growth in the quality of their handwriting between the pre and post test. The student with ADHD symptoms had and improvement on eleven percent between tests. This would suggest that the stability balls had a positive affect on the quality of handwriting in the grade five classroom and an even greater affect on the student with ADHD's handwriting.

### Students Perceptions of the Stability Ball

Students were asked to give input into the use of the stability balls as chairs in the classroom. The students filled out two surveys. The first survey was given before the use of the stability balls as chairs and asked the students questions that related to the use of regular classroom chairs.

The first survey had four questions. Twenty three grade two students and nineteen grade five students answered these questions.

The first question asked how comfortable the students were in chairs. Students were asked to circle one of four choices.

	Really comfortable	Comfortable	Uncomfortable	Really Uncomfortable
Number of students	1	13	11	17

The second question asked the students what they did not like about sitting in regular chairs at school. The following comments were received:

- Nine students stated that chairs hurt their backs
- Six students stated that chairs don't move and make them wiggle too much
- Five students stated that chairs were too hard
- Four students stated that chairs were uncomfortable
- Four students stated that chairs tip over
- Two students stated that chairs make their legs fall asleep
- One student stated that chairs make them slouch
- One student stated that chairs were noisy

The third question asked the students what they liked about sitting on the chair at school. The following is the results from this question:

- Eight stated that chairs were good for resting your back
- Seven stated that chairs were better than sitting on the floor
- Three stated that chairs were better than standing
- Two stated that chairs were stable
- Two stated that you can rest your legs
- Two stated that you can sit in different positions
- Two stated that you could lean back
- One stated that you could reach your desk because they are high

The fourth question asked the students what can be done to make chairs more comfortable. The following are the results from this question:

- Twenty-one stated that you could put cushions on the chairs
- Eight stated that nothing made it more comfortable
- One stated that putting a sweater on it made it more comfortable
- One stated that sitting on their feet made it more comfortable
- One stated leaning back made it more comfortable

The post ball survey asked the students give their opinions about the stability ball as a chair. The post survey asked four questions. Twenty three grade two and nineteen grade five students answered the survey.

The first question asked the students how comfortable they are on the ball. The following is the results of this question:

	Really comfortable	Comfortable	Uncomfortable	Really Uncomfortable
Number of students	20	19	4	

The second question asked the students what they did not like about sitting on the ball. The following is the result of this question:

- Ten stated that their was nothing that they disliked about the balls
- Eight students stated that they fall off their balls
- Eight stated that others take their ball
- Five stated that the balls roll away
- Four stated that they could not lean back
- Two stated that the movement was distracting One stated that they were not allowed to bounce all the time
- One stated that his or her legs hurt

The third question asked the students what they liked about the stability balls. The following are the results of this question:

- Eleven stated that the balls are more comfortable than chairs
- Seven stated that they are bouncy
- Six stated that they feel they have better posture
- Four stated that they feel better on the balls
- Three stated that they feel they work better on the balls
- Three stated that their backs do not hurt
- Three stated that they are fun
- Three stated that they are soft
- One stated that they have more movement on the balls

The fourth question asked how the balls could be made more comfortable. The following are the results of this question:

- Thirteen stated that adding or taking out air helps make them more comfortable
- Six stated that having back rests would make them more comfortable
- Two stated that moving or bouncing helped make them more comfortable

*Discussion:*

The data collected about student perceptions about the ball indicates that students prefer to use the stability ball over the regular classroom chair. Recently, I asked the teachers to let me know if anyone has asked to go back to the chairs. Five students in each class have gone back to the chairs. The grade five teacher told me that the student's stayed on the balls or went back to the chairs for the same reason. They either stayed on the ball because they liked the movement or they went back to the chairs because they did not like the movement. Those who went back to the chairs also stated that they missed the back rest.

#### Teacher Perception

The teachers involved in this stability ball experiment became involved with the project for several reasons. First, they expressed an interest in using the balls because of personal use with stability balls at home or at the gym. They both had read articles that suggested that the stability ball helped children stay on task, kept students healthy through more physical activity, and that students handwriting improved.

The teachers were hoping that the balls would improve concentration and attention, strengthen the student's posture and balance, and that there would be less inappropriate student classroom disturbances on the ball. They also stated that the students may gain an awareness of what they need to learn more affectively.

The teachers also expressed some concerns about using the balls. They stated that they were concerned that the students may become over stimulated or distracted by the

movement on the balls. They also expressed concerns about if the students might hurt themselves by tipping over on the balls or from having to actively sit on the balls without a backrest for extended periods of time.

After the project the teachers indicated that the experience was positive. They said that they would definitely use the balls in their classrooms again. They listed some of the benefits of the balls as:

- children stayed at their desks for longer periods of time
- the balls decreased that amount of inappropriate fidgeting while listening
- the children were more comfortable and relaxed
- the desk and chair fit was better than with the chairs
- balls could be used in the gym for other fitness activities
- ball improves posture – parent commented on improve posture while sitting at home
- the balls make less noise in class
- printing improved
- balls were fun and exciting which created a more interesting school environment

The teachers also listed some things that need to be considered about the use of the ball:

- some kids missed having a back rest
- some kids have chosen to go back to chairs because the movement distracts them
- having chairs and tables for children to move back and forth to is important to give students the breaks from the balls they might need and to give them appropriate sitting choices
- having a separate area with chairs and tables for children to move back and forth to is important because desk height is difficult to change
- balls should be labeled to alleviate problems surrounding ownership
- you should have a few extra balls because a few have deflated
- initial implementation takes a lot of class time
- initial implementation is essential to the success of the stability ball program
- chairs became part of the furniture eventually and teachers had to remind themselves to use them as stretching and activity tools occasionally

### Conclusion

The results of this study show that there is a general improvement in on task behaviour by and handwriting as a result of the use of stability balls as a chair in the

classroom. Although there are several other reasons that the students could have improved the amount shown in this study without the use of the stability balls - including maturity increases over the two and one half months, teacher expectations, and adjustment to classroom routine- the results were promising. Even so, more study in this area is definitely needed to help explain inconsistencies in attention and achievement especially in the grade five classroom environment. This study did not include a test group that did not use the balls. Having a test group would have also helped eliminate the other factors involved in student growth.

Overall, the use of stability balls in the classroom is perceived as positive as long as the students earn the use of the balls through the training program and as long as the students and teachers are given the choice of use on a daily basis.

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