# The impact of integrated movement-based activities on primary school aged students in the classroom

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**Statement of Original Authorship**

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## ABSTRACT

Movement-based activities can have benefits for children from early childhood and into formal education. However, most current research concerns movement-based activities which are a part of physical education classes. Integrated movement-based activities are activities that involve physical movement that are used to teach subjects other than physical education in the primary curriculum. For example, asking students to demonstrate their understanding of the water cycle by using movement to act out the process. The purpose of this study is to outline the impact that integrated movement-based activities such as this can have on primary school aged students.

To answer this research question the study was separated into three phases which were conducted in both lower and upper primary classrooms. The data were collected using student guided self-reflection journals, numeracy tests, self-rating scales of concentration, teacher interviews and researcher observations and reflections. The data were then analysed using open-coding methods and it was found that when a supporting classroom environment and structure is established, integrated movement-based activities can impact positively on students' concentration, enjoyment of learning, engagement in learning and interpersonal relationships.

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# PROLOGUE

*She was a pre-service teacher in a Year 5 classroom. She was teaching English and there was one student who was not focusing on his work. He was obviously distracted and unmotivated. His worksheet page was empty of any answers and he was regularly glancing around the classroom and talking to the student seated next to him. He was disengaged and was starting to distract others around him. As a third year pre-service teacher, she knew that this type of behaviour was not conducive to learning and that it was her job to help remedy the situation.*

*She remembered that she had once learnt that some children do not generally like sitting in one place for too long and that they need to engage in more physical movement than girls. So she put this theory into practice as she crossed the classroom to stand in front of the desk of the unfocused student. Instead of reprimanding him for his lack of work, she took a different approach. Instead of inflicting a negative consequence for his actions, she told him that she would let him go for a run, up and down the stairs just outside the classroom, on the condition that he would promise that when he came back he would do his work. He seemed very excited about that idea and promised to agree to her conditions, as he quickly got out of his seat and ran out of the door. He was back in the classroom and at his seat in less than thirty seconds and instantly he was focused on his work. He flew through all the questions faster than any of the other students in the class that day with a big smile on his face. This sudden change in concentration as a result of the movement fascinated his teacher and ultimately became the inspiration for this thesis.*

# CHAPTER 1 – INTRODUCTION

The link between physical movement of the body and academic learning is progressively becoming more evident as knowledge in the area of neuroscience expands (Jensen, 2008). When movement and movement-based activities are included or integrated into the school curriculum, these activities can have a specific impact on students. There is evidence to suggest that the integration of movement-based activities or brain-break activities into the curriculum can improve student learning (Hawke, 2007; Jensen, 2008).

Movement is the process of moving one or more body parts whereas exercise is movement for a sustained period of time. Integrated movement-based activities are activities that use movement, in conjunction with other teaching strategies, as methods to teach concepts from key learning areas other than physical education. For example, asking students to explain the scientific process of the water cycle by using movement of their bodies. Alternatively, brain-break activities are movement-based activities that are not purposely integrated and not necessarily linked to teaching key learning areas. Instead they simply provide students with a break from their academic work that involves movement, such as marching on the spot. The movement for both of these types of activities can include any action that involves the movement of one or more body parts. In this thesis the researcher will explore the use of integrated movement-based activities in the primary classroom and the nature of the impact such activities have on the students.

## Purpose and Aim of the Study

The purpose of this study is to explore the nature of the impact that movement-based activities have on primary school aged students in two particular classes of students in both lower and upper primary school. The findings from this study will contribute to the growing body of knowledge concerning the impact that movement-based activities can have on learning and the educational experience of primary school aged children.

## Research Questions

This study explores the use of movement-based activities in primary classrooms and seeks to answer the question:

> How do integrated movement-based activities impact on primary school aged students in the classroom?

The study will also answer these subsidiary questions:

- What is the specific impact of movement-based activities on students' concentration, enjoyment and engagement in learning?
- How do movement-based activities impact on the students' interpersonal relationships?
- How does the classroom environment and structure affect the use of movement-based activities?

## Background

"Movement begins at birth and continues throughout one's life" (Davis, 2005, p. 7). When movement is a part of a child's life from a young age, it helps to build confidence and a positive attitude towards movement activities (Bouffard, Watkinson, Thompson, Dunn, & Romanow, 1996; Hands & Martin, 2003). During formal education these movement-based activities are usually taught as a part of physical education classes. Many teachers have discovered the positive impact that these activities may have on their students' well being, concentration, coordination and social, cognitive and leadership skills (Di Sisto, 2002). However, other researchers, such as Morgan (2005b), suggest that many primary teachers lack confidence to teach these activities in physical education classes. As a result, primary teachers sometimes choose to teach physical education less often, despite knowing the benefits that physical education classes can have for their students.

Cross-curricular integration of movement-based activities is another technique that encourages movement activities in the classroom. This teaching method involves integrating multiple key learning areas, such as mathematics and physical education, in a way that promotes learning in an enjoyable and engaging way (Purcell-Cone, Werner, & Cone, 2009, pp. 4-5). When students are involved in an engaging learning experience they display more concentration, a greater interest in the topic and exhibit intrinsic motivation to learn. However, some teachers find it challenging to plan integrated lessons and, as a result, some research has been done to develop possible strategies to integrate movement-based activities into all key learning areas (Lapere, Mummery, & Yates, 2008). Findings from these studies suggest that teachers need

more support to help them plan and integrate movement-based activities into their classrooms.

Companies such as Brain Gym International and Learning Connections provide teachers with the training required to implement movement-based activities that they have been specifically designed to improve students' academic performance (Brain Gym International, 2003; Hawke, 2007). These methods are based on the rapidly growing area of neuroscience, and on current knowledge about how exercise influences the brain and consequently impacts learning (Jensen, 2008).

## Rationale

Although many teachers acknowledge the importance of including movement-based activities in the classroom, some still lack the background knowledge and professional development that would give them the confidence to teach using these activities (Morgan & Bourke, 2004, p. 1). Consequently, further research needs to be conducted to highlight the impact that movement-based activities can have on primary school aged students. This study provides evidence to illustrate how integrated movement-based activities impact on primary school aged students in the classroom.

## Overview of the Research Methodology

This study is based on a mixed methods approach which uses primarily qualitative strategies, with some supplementing quantitative methods. The tools of grounded theory were used to plan the study and analyse the results. To reflect an emergent

design approach, the data collection was conducted over three phases, allowing earlier phases to inform later phases, in accordance with the theory of emergent design:

- **Phase One:** Movement-based activities integrated into a Stage Three (Year 5) classroom.
- **Phase Two:** Movement-based activities integrated in an Early Stage One (Kindergarten) classroom.
- **Phase Three:** Movement-based activities integrated into a Stage Three (Year 5) classroom.

## Structure of the Thesis

This thesis is designed to clearly outline the process and reasoning behind the methods that the researcher took to investigate this topic and to describe the study's findings. Chapter 2 outlines the current literature relating to this topic and the gaps in our current understanding that need to be filled. Chapter 3 describes the methodology behind how the data collection instruments were designed and analysed, and contains examples of how the data were analysed. Chapter 4 explores the findings of the research and Chapter 5 discusses the themes that have emerged from the data analysis in relation to previous research findings. Finally, Chapter 6 provides a summary of the thesis and offers recommendations of areas where future research could be conducted.

# CHAPTER 2 - LITERATURE REVIEW

The aim of this literature review is to form an overview of the research that has been conducted so far concerning movement and exercise in the educational field and its link to primary school students' learning. The literature review will firstly examine movement as a part of the early childhood classroom. Secondly, the benefits of movement as a part of the primary school curriculum will be introduced. The benefits of movement programs such as Brain Gym and Learning Connections will then be analysed and the benefits of integrating movement-based activities into the classroom will be explored. A specific emphasis throughout the literature review will also be placed on the impact of movement-based activities on students in a classroom situation. Finally, the importance of maintaining a focus on brain-based education in the primary classroom will be established.

Learning to move is a lifelong process. As a result movement is an essential part of education, and movement-based activities are included in the typical primary curriculum. Teachers and researchers have identified that movement-based activities can have many benefits for students (Cosentino & Wyrzkowski, 2007a; Di Sisto, 2002; Dodd, 2003).

Information in the area of neuroscience and how the brain works is continuing to increase. The impact that physical movement has on the brain's ability to learn is an area of current interest (Hawke, 2007; Jensen, 2008). The findings from studies conducted in this area so far have identified direct links between movement-based

activities and educational practices in primary school classrooms (Brain Gym International, 2003; Hawke, 2007; Jensen, 2008).

Movement-based activities and brain-break activities as part of the school curriculum can have an impact on students and on their educational experience (Di Sisto, 2002; Dodd, 2003). Integrated movement-based activities are activities that are used to teach concepts from key learning areas other than physical education. For example, a movement-based activity where the students imitate the moving particles of ice as it melts by using their own body movements, could be used to teach the scientific concept of melting. Brain-break activities are movement-based activities that are not necessarily integrated into teaching key learning areas other than physical education. The movement for both of these types of activities can include any action that involves the movement of one or more body parts to increase the students' ability to learn.

Paul E. Dennison, the founder of Brain Gym, has discovered that "movement is the door to learning" (The Lydian Centre for Innovative Medicine, 2010). Some research, such as that described by Jensen (2008) and others outlined by Brain Gym International (2003) and Hawke (2007), supports Paul E. Dennison's statement about the link between exercise, movement and learning. However, movement-based activities in primary schools can be used in a variety of different ways but the activities are not always emphasised in the everyday curriculum.

## Movement and Exercise Defined in Context

Movement-based activities and exercise can take on many forms when associated with education. In early childhood education there is often a focus on teaching fundamental motor skills such as jumping and arm movements during running, that are essential for transition into formal schooling (Davis, 2005; Hands & Martin, 2003). In primary school education, movement is often limited to short bursts of physical education classes, and the emphasis put on these activities varies between schools (Di Sisto, 2002, p. 13). Bagot (2005, p. 12) explains that in some schools children get the majority of their exercise from play time, but the extent to which this will occur depends on the extent to which natural environmental features are incorporated into the playgrounds design. That is, playgrounds that have large outdoor areas in natural environments are more conducive to active play than those playgrounds that are confined to small, built environments. Instead of expecting the students to move only during play times and physical education classes, advocates for brain-based learning have the view that it is also important to incorporate movement into the classroom in smaller bursts across the whole day, to help to improve student learning (Brain Gym International, 2003; Hawke, 2007; Jensen, 2008).

Brain-based learning and education is based on current neurological research which has shown that exercise and movement can release positive neurotransmitters in the brain. These neurotransmitters can increase motivation, concentration and attention span (Burns, 2007, p. 28; Jensen, 2008). The results from these non-classroom based studies are beginning to be explored in the educational setting (Brain Gym International, 2003; Hawke, 2007) and there is certainly a need for further research into this area, especially in a school environment.

## Movement in Early Childhood

Learning to move begins from birth and continues into early childhood. It is essential for all children to have positive experiences with movement at an early age, so that they continue to develop a constructive attitude towards exercise and movement into the future (Hands & Martin, 2003, p. 47). A study conducted by Bouffart, Watkinson, Thompson, Dunn and Romanow (1996) indicated that children who did not have confidence in their motor skills were generally less physically active.

As a result of the study done by Bouffard et al (1996) and other similar studies (Li & Dunham, 1993; Parker, Larkin, Anderson, Clarke, & Smith, 2000), Hands and Martin (2003, p. 48 & 49) developed the Fundamental Skill Teaching and Learning Program as a resource for teachers in an early childhood setting. The program outlines strategies to help teachers develop and assess their students' fundamental movement skills. Hands and Martin (2003, p. 48 & 49) then researched the effectiveness of this program by conducting case studies of the teachers who began to use this program with their students. As a result of this program being implemented, the children showed an increase in physical activity levels and confidence in their own general abilities, and they had a greater knowledge of fundamental movement skills.

Davis (2005, p. 11) had similar results when she conducted informal assessment of the gross motor skills of young children. She discovered that when the children with disabilities practised these gross motor movements, their confidence in their abilities increased. She showed that while students were moving during the activities they were able to effectively problem solve, and apply their language and academic skills better in the informal movement-based environment. These observations and results

show that when students are involved in movement-based activities, the activities can help to increase the students' confidence in their personal abilities. More formal research could be done in this area with a specific focus on the extent of the academic improvement gained as a result of being involved in movement-based activities.

## Movement in Formal Education

Multiple authors argue against the idea of dualism of the mind and body, and instead support the theory that the mind and body are connected (Dodd, 2003; Hunter & Macdonald, 2005). This connection has important implications for teachers of primary school students. To ensure that school-aged students are engaged in their learning, it is essential for teachers to provide for their students' physical nature (Hunter & Macdonald, 2005, p. 10). As a part of his extended PhD research across fifty-four years, Dodd (2003) studied the link between memory and movement. To conduct this study Dodd used an autoethnography method to examine the memories of school-aged children that involved a movement or action. He discovered that there was a direct link between human motion, emotions and reasoning. This connection between movement and reasoning could increase the benefits of integrating movement-based activities into a formal school environment.

Dodd (2003, pp. 2-3) maintains that there are many benefits of physical education in school. He helped to coordinate the progress of the Daily Physical Education Program created by the Australian Council for Health, Physical Education and Recreation (ACHPER). Thousands of teachers Australia-wide were involved in this program for over seven years. This study found that the students who were a part of this physical

education program became more involved in classes, and improved their self-confidence, self-esteem, and interpersonal relationships. Consequently, this evidence shows that there are many benefits for including movement in curriculum in a primary school.

Di Sisto (2002) interviewed a group of primary educators from Australia and New Zealand to find out their beliefs about the benefits of having physical education as a part of the school curriculum. Overall, the educators in their study witnessed that exercise gave their students confidence, increased their sense of well being, improved their social, cognitive and leadership skills, improved sportsmanship, aided concentration, advanced their listening skills, helped with co-ordination and had many other health benefits. For example, Di Sisto (2002, p. 13) explains that Ms Ali from Coatesville Primary found that physical education helped to settle her students and make them more focused and motivated to do the work at hand. As a result, she began every Monday morning with a physical education class to improve her students' concentration levels for the rest of the day through the use of movement-based activities.

Cosentino and Wyrzkowski (2007b, p. 15) have seen the benefits when their students have an active lifestyle: "We see better levels of concentration, better nutrition, the self awareness that comes with learning how to win – and lose – graciously, the refinement of teamwork skills, and increased self-esteem" (Cosentino & Wyrzkowski, 2007a, p. 15). Consequently, movement as a part of education is an important area to study to help maximise students' learning potential and personal development opportunities.

Even though there are multiple studies that identify the many benefits of physical education classes (Davis, 2005; Di Sisto, 2002; Dodd, 2003), this subject is taught less than the recommended allocated time in Australian schools (Morgan, 2005a; Morgan & Bourke, 2004). Often primary teachers lack confidence in their ability to teach physical education and this can result in fewer physical education classes or lower quality lessons being taught (Morgan, 2005a, p. 21). A study by Morgan and Bourke (2004, pp. 10-11) found that the majority of generalist primary teachers would prefer not to teach physical education classes if given the choice between teaching physical education or another key learning area. This study also showed that the majority of teachers only taught physical education once a week or less than once a week. Nevertheless, these same teachers indicated a belief that physical education was still an important and valuable class for students, showing a discrepancy between what they believed and their corresponding actions. The findings of these studies indicate a need for more resources, research information and professional development opportunities to be made available to help encourage Australian teachers to include more physical education classes in their curriculum.

## Interdisciplinary Education

The benefits of physical education classes for students can be enhanced through effective use of interdisciplinary education. According to Purcell-Cone, Werner and Cone (2009, pp. 4-5), interdisciplinary education is a teaching method that involves integrating multiple content areas to promote learning. This method of teaching is enjoyable and motivating for students, helps students to think in different ways and on

varied cognitive levels, encourages creativity, helps students to see a topic in context and takes into account individual students' learning styles.

Overby, Post and Newman (2005, p. 2) have written a book called *Interdisciplinary Learning Through Dance: 101 Moventures*, concerning the benefits of the integration of dance into other key learning areas to help teach new concepts faster. They quote Elaine Flore, a middle school language arts teacher, who believes that: "Students learn much more when they're allowed to use their bodies and movement instead of just reading books, articles, materials, and bibliographies to make these activities possible" (Overby et al., 2005, p. 2). More research could be done to discover if there is a connection between the enjoyment of a lesson as a result of movement-based activities and the amount of content learnt or the quality of learning.

If exercise and movement are as beneficial as these authors claim, then it is possible that the integration of exercise and movement-based activities into all key learning areas could be more beneficial than simply teaching one short physical education session a day. Some research has recently begun in this area. Lapere, Mummery and Yates (2008) identified that integrating movement-based activities into the curriculum is a challenge for most teachers. As a result, they conducted a study which explored strategies of how to practically integrate movement into the key learning areas across the primary curriculum. In this study, a qualified teacher implemented the 1,0000 steps program in his classroom, which involved giving each student a pedometer to record the amount of steps taken each day. The total number of steps taken by the class was then entered into the web-based program to show the class progress towards a specific destination. The teacher in this study kept a diary of the learning

experiences he used in the classroom that involved physical movement and also recorded how these movements were integrated into the key learning areas. Throughout the study the teacher sought informal opinions about the program from the students and their parents, and then, at the conclusion of the study, the teacher was also interviewed by the researchers. This study showed that cross-curricular integration of movement-based activities is possible. However, if exercise and movement is to be integrated into all classes, then further research needs to take place to show its direct benefits.

## Brain-based Education and Neuroscience

In addition to the benefits indicated by observational classroom studies, some of the possible benefits of movement and exercise in relation to education have been identified by studies in the area of neuroscience. In Jensen's (2008) well known book *Brain-based Learning*, he outlines the many benefits that physical exercise has on the brain, especially in connection to education and learning. He notes that exercise increases blood circulation which allows nutrients to get to the brain faster. He also indicates that it is possible that exercise stimulates the release of nerve growth factor - a hormone that improves brain performance (Jensen, 2008, p. 38). This research indicates a connection between a person's physiology and their thinking and learning abilities.

Research conducted using mice by Van Pragg, Christie, Sejnowski and Gage (1999) suggests that it is possible that exercise can stimulate the production of new brain cells, which would help to create better moods in students, and improve memory and

learning. Contrary to previously held beliefs about the possibilities of brain recovery, it has recently been discovered that stroke victims can now learn how to move correctly again through the use of specific physical exercises that stimulate the brain (Doidge, 2007). This provides evidence to support the theory that the brain is not static, but instead it has plasticity and can change and repair itself. The brain's ability to change suggests the possibility that introducing integrated movement-based activities into a classroom may help the students to learn more efficiently by providing the stimulus that the brain may need to positively influence thinking and learning processes.

The chemicals that are released in the brain have an influence on the brain's learning capacity. It has recently been discovered that when exercise and movement take place, neurotransmitters (such as acetylcholine, dopamine and norepinephrine) are released (Burns, 2007; Jensen, 2008). Acetylcholine keeps attention levels high, dopamine helps maintain motivation and helps the brain to remember new connections it has just learnt, and norepinephrine helps the brain to maintain focus and interest in learning (Burns, 2007; Jensen, 2008). According to Burns (2007) the way that material at school is taught, will affect the neurotransmitters that are released. He maintains that exercise is not the only catalyst for the release of these chemicals. For example, praise from a teacher and the use of interesting educational materials will also trigger the release of dopamine and norepinephrine. These physiological studies show evidence that movement-based activities are beneficial for learning (Jensen, 2008). Consequently, further research needs to take place to indicate the extent to which exercise affects the release of neurotransmitters, and what in fact is the main contributor of their production. Many companies have already taken advantage of this

research which suggests the benefits of movement-based activities and have created school-based programs aimed at improving student performance in the primary classroom (Brain Gym International, 2003; Hawke, 2007).

## Brain Gym International

"Brain Gym International is a nonprofit organization committed to the principle that intentional movement is the door to optimal living and learning" (Brain Gym International, 2009, p. About Us). Brain Gym was co-founded by Paul E. Dennison and Gail E. Dennison in 1987 in the United States of America, as a consequence of the seminal research Paul Dennison conducted previously on the connection between reading development and the brain. As experts in education kinesiology, Paul and Gail Dennison have developed movement-based activities that have been later proven by many researchers to have a positive effect on students' learning, especially in the area of reading and comprehension (Brain Gym International, 2003, 2009).

Brain Gym also emphasises cross-lateral physical movements, which involve using the two sides of the body at the same time such as crossing the left knee over to touch the right elbow. These types of movements help to activate learning (Jensen, 2008, p. 41). Jensen (2008, p. 41) also suggests giving the students "brain breaks" when their attention starts to lag in order to refresh their concentration. Brain breaks can involve any type of physical activity from simply moving to a different location in the classroom, to body stretches or cross-lateral physical exercises. All of these activities are important because: "An active body enhances an active mind" (Jensen, 2008, p. 41).

## Learning Connections

Learning Connections is another movement-based program, similar to Brain Gym International, that is based on current neurological discoveries concerning the connection between movement and learning (Hawke, 2007, p. 11). According to Hawke (2007, pp. 10-11), this Australian based company designs programs to be taught to children in varied contexts: individually at the centre; in an early childhood centre setting; in the school setting; and during after-school care. The movement-based activities in this program have been especially designed to help children with learning difficulties and neurodevelopment delays but they have also been proven to help children with average and above-average intelligence to improve academically.

According to Hawke (2007, pp. 3-5), the Learning Connections school program has, in many cases, been extremely successful. The program has been shown to improve students' behaviour, concentration levels, social interactions with others and academic results. For example, in 2001 the Learning Connections school program was introduced in a Queensland Year 1 classroom at Killarney State School. As a result of implementing the program, teachers discovered that their students all showed improvement in their concentration levels, their behaviour and especially in their ability to follow the teacher's instructions. This program has been studied in many Australian schools and the results of these studies have shown that the academic results of the students have greatly increased (Hawke, 2007). Findings from these studies show that the movement-based activities in this program have benefited the students academically.

## Exercise as a Behaviour Management Strategy

Although there is plenty of evidence to suggest that exercise could be highly beneficial for use in the classroom for gaining attention and helping students to remain on-task, there is a surprising lack of information on the value of exercise in general instructional textbooks for teachers. Many textbooks have specific chapters concerning on-task behaviour and many suggest strategies such as considering seating arrangements, group sizes, the mode of teacher instruction, the educational activities used, minimising distractions and directing questions to all the students (Edwards & Watts, 2004; Little, 2003; Marsh, 1996). Other textbooks have chapters concerning developing motivation in students and discuss how motivation can be intrinsic or extrinsic (Barry & King, 1998), but very few textbook authors take into account the fact that research has shown that stimulating the production of dopamine in the brain can also encourage motivation to learn (Burns, 2007). Very few teacher education textbooks mention the fact that exercise can have a large effect on students' learning ability, attention span, concentration and on-task behaviour (Barry & King, 1998; Edwards & Watts, 2004; Little, 2003; Marsh, 1996). This is something that could be added to teacher education textbooks in the future once studies into this area are conducted.

## Conclusion

For many years movement-based activities have been incorporated into the educational curriculum of schools in a limited way, through the use of separate physical education classes. Often teachers have found it too much of a challenge to incorporate movement-based activities into other key learning areas and,

consequently, the benefits of these activities is still to be fully recognised in education (Lapere et al., 2008).

So far it has been discovered that it is essential for children to have a positive experience with movement at a young age, to increase their confidence in their personal abilities (Davis, 2005; Hands & Martin, 2003). Consequently, teachers should continue to integrate movement-based activities into the years of formal education. Informally, many teachers have recognised that physical education classes provide many benefits for their students, and help them to learn better and maintain their focus (Di Sisto, 2002). Some evidence for why this occurs has been found through the study of the brain and the chemicals that it releases when a person exercises and moves (Burns, 2007; Jensen, 2008). However, many teachers still do not have the confidence, perceived skills and time to teach physical education frequently enough for it to make a difference in their students' learning (Morgan, 2005a; Morgan & Bourke, 2004).

Some researchers have developed practical movement-based activities to stimulate learning and consequently have created companies such as Brain Gym International and Learning Connections (Brain Gym International, 2003, 2009; Hawke, 2007). Nevertheless, exercise and movement has still has not been given the recognition it deserves in educational circles (Barry & King, 1998; Edwards & Watts, 2004; Little, 2003; Marsh, 1996). Obviously, more research needs to be conducted concerning the impact of movement and exercise on students' classroom learning, to discover more fully its impact on students and their learning. As a result the researcher of this study documented the process of implementing integrated movement-based activities into

the primary classroom, to determine the impact of these activities on the students. This thesis will answer this question:

> How do integrated movement-based activities impact on primary school-aged students in the classroom?

# CHAPTER 3 - METHODOLOGY

To discover the impact on school students when movement-based activities are integrated into a primary curriculum, the researcher began by designing a specific methodology. The emergent design approach (Charmaz, 2006) informed the development of the key research question:

> How do integrated movement-based activities impact on primary school aged students in the classroom?

Before data were collected the research question was refined, the design of the study was constructed, and appropriate participants and settings were selected. The researcher then gained ethics approval (see Appendix 3.1 – Ethics Clearance) and designed the data collection instruments and the data analysis procedures in line with the key research question and the subsidiary questions. This chapter outlines this process and explains how the methodology was used to conduct research into the impact of integrated movement-based activities on primary school aged students.

## Development of the Research Questions

The research questions were informed by the findings outlined in the literature review and the gaps which were found in previously conducted research. The researcher began by questioning whether integrated movement-based activities were linked to the attention span of students in primary classrooms. However, the themes that emerged from the data analysis process in Phase One of the study indicated that the

original focus of inquiry needed to be expanded to include more facets than simply attention span. This alteration of the study occurred as a response to the qualitative approach to this research, which is based on emergent design and naturalistic inquiry (Patton, 2002, p. 40). As a result, the focus of the research expanded and, subsequently, the research question evolved into:

> How do integrated movement-based activities impact on primary school aged students in the classroom?

To further explore other areas suggested as being important in Phase One of the study and in the literature review, the subsidiary questions included:

- What is the specific impact of movement-based activities on students' concentration, enjoyment and engagement in learning?
- How do movement-based activities impact on students' interpersonal relationships?
- How does the classroom environment affect the use of movement-based activities?

## Research Design

In general, research designs can be described as being either qualitative or quantitative. Quantitative research is "the collection of data to explain phenomena numerically" (Jackson & Taylor, 2007, p. 74) and its purpose is to study a phenomena with a deductive approach, using preselected instruments, large sample groups and statistical analysis of the data (Ary, Cheser Jacobs, & Sorensen, 2010, p. 25).

Alternatively, qualitative research is "the collection of data to provide narrative descriptions of phenomena" (Jackson & Taylor, 2007, p. 74). According to Ary et al (2010, p. 25), its purpose it to study phenomena in great detail and, as a result, small sample sizes are often used. The qualitative researcher also needs to be flexible, take an inductive approach and let the data influence the design and direction of the study. In this study the researcher used this qualitative approach to investigate the impact of integrated movement-based activities, by undertaking sustained periods of data collection and adopting a flexible and emergent design of research (Charmaz, 2006).

Educational research design often involves a combination of both qualitative and quantitative techniques, with one approach being slightly more dominant than the other (Jackson & Taylor, 2007, p. 71). This is called a mixed methods approach and can give the researcher a better understanding of the research question by examining it from multiple viewpoints and styles (Creswell & Plano Clark, 2007, p. 5). According to Creswell (2005, p. 514), there are three different mixed methods designs which include triangulation, explanatory, and exploratory approaches (see Figure 3.1 – Types of Mixed Methods Designs**)**. In this study the triangulation mixed methods design was used as a rigorous approach to enable the acknowledgement of varied perspectives and increase the credibility of the data (Patton, 2002, p. 563). This method allowed the researcher to discover the impact of integrated movement-based activities on the primary students from varied points of view, including the teachers', the students' and the researcher's perspectives.

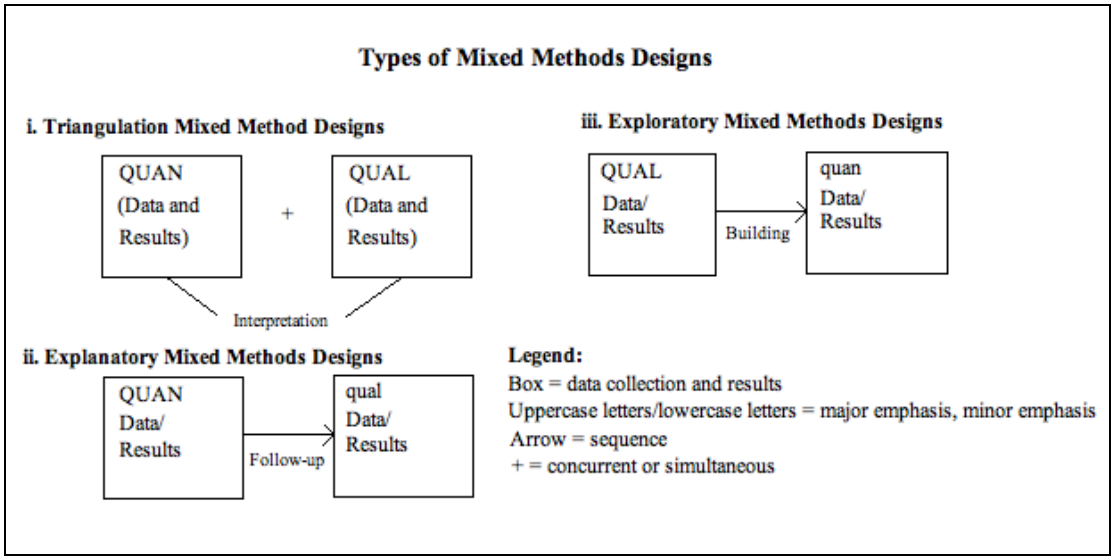


*Figure 3.1.* Types of Mixed Methods Designs (Creswell, 2005, p. 514)

## Ethics Clearance

Before beginning any form of data collection, permission to conduct the research was first gained from the Avondale Human Ethics Committee (see Appendix 3.1 – Ethics Clearance). This committee reviewed the application to ensure that the participants in the study would be protected and respected, their identities would be kept anonymous, and that the data would be stored in a safe and secure place. Information statements and consent forms for the participants' parents and teachers were also included in the application (see Appendices 3.2, 3.3, 3.4, 3.5, 3.6 and 3.7– Information and Consent Forms for Phase One, Two and Three). These forms outlined for the parents and the teachers what was involved in allowing their child or their students to participate in the study. Only those students who returned completed consent forms were included in the study. The researcher, in conjunction with the classroom teacher, also took care to make sure that any risks were limited so that the children's participation in the study was not burdensome. After permission was granted from the Avondale Human

Ethics Committee (see Appendix 3.1 – Ethics Clearance), the researcher was able to proceed with approaching the schools selected for inclusion in the study.

## The Natural Settings of the Study

The research took place within varied natural settings. This study was separated into three phases to explore the impact of integrated movement-based activities on the students in both lower and upper primary school classes (see Table 3.1 – The Three Phases of the Study). All the phases of this study were conducted in similar schools. The two schools were located within 70km of each other in the Lake Macquarie region of New South Wales. Both schools were private schools and offered Kindergarten to Year 12 classes with double streaming in the primary school and had over 600 enrolled students at the time of the study.

Table 3.1
*The Three Phases of the Study*

| | |
|---|---|
| February 2011 | Phase One: Two Weeks |
| June 2011 | Phase Two: One Week |
| July-August 2011 | Phase Three: Six Weeks |

Phase One of the study was conducted over two weeks in an upper primary classroom, and involved the students' reflections on the movement-based activities as the researcher integrated them into her teaching. Phase Two was conducted in a similar school in a lower primary, kindergarten classroom as the researcher observed two full time teachers team teach and integrate movement-based activities into the

curriculum over a one week period. Phase Three was conducted over six weeks while the researcher taught at the same school and in the same upper primary classroom as during Phase One. The focus in Phase Three was on the researcher's own personal reflections and those of the students as she integrated movement-based activities into her lessons over a period of six weeks, and her observations as a teacher-researcher on how the activities impacted on the students in the class. Consequently, data were collected across three phases from the perspective of the researcher, the teachers and the students (see Table 3.2 – Varied Perspectives of the Participants).

Table 3.2
*Varied Perspectives of the Data*

| | Researcher's Perspective | Teacher-Researcher's Perspective | Full Time Teacher's Perspective | Students' Perspective |
|---|---|---|---|---|
| Phase One | | ✓ | | ✓ |
| Phase Two | ✓ | | ✓ | ✓ |
| Phase Three | | ✓ | | ✓ |

Phase One and Phase Three of the study were conducted in an upper primary classroom that had a total of 24 students, of which the majority was male. During Phase One the students sat at desks which were organised into group configurations of six. However, during Phase Three this seating arrangement had been altered to be organised in three rows instead. This suited the existing instructional style of teaching conducted in this classroom.

Phase Two of the study was conducted in a lower primary, kindergarten classroom where the two classes had been combined into one, with two teachers, one teacher's

assistant and 40 students. The classroom was in a demountable building and the wall in between the two rooms had been removed to make enough space for all the students. All the desks were arranged in groups to accommodate the group activities that were done with the class every day. There were no set seating arrangements so the students were allowed to choose where they sat. This structure worked very well in this classroom and allowed for more movement to occur as the students moved from table to table to complete different activities throughout the day.

In each phase of the study, the natural setting of the classroom (including the seating arrangements and classroom organisation) was maintained in order to reduce any unnecessary disturbances to the children's learning.

## The Participants

After ethical clearance was obtained (see Appendix 3.1 – Ethical Clearance), the principals from the two participating schools were contacted, and their involvement in the study was requested. Both principals and the individual classroom teachers in these schools gave their permission for the researcher to conduct the research and to send out letters of explanation and consent forms to the parents of the students in the designated classes. Once the researcher received the completed and signed permission forms from the parents, the data collection began with the aid of the classroom teachers.

To enable multiple perspectives to be investigated, the study included participation from the researcher, the classroom teachers, and the students. The participants in

Phase One and Phase Three of the study were students in Year Five and were between the ages of ten and eleven. The participants in Phase Two of the study were students in a lower primary, kindergarten classroom and were between the ages of four and six. Both classes had more male students than female students (see Table 3.3 – Classroom Gender Distribution). The teachers in the kindergarten classroom also agreed to participate in the study by allowing the researcher to observe their teaching and interview them about the movement-based activities they integrated throughout their lessons. These multiple sources of data ensured the credibility of the results because the findings were established from a variety of different of perspectives (Patton, 2002, p. 51).

Table 3.3
*Classroom Gender Distribution*

| | Boys | Girls | Total Number of Students |
|---|---|---|---|
| Phase One | 14 | 10 | 24 |
| Phase Two | 20 | 19 | 39 |
| Phase Three | 14 | 10 | 24 |

The research question, the setting of the three phases, and the participants, were all considered when selecting an approach to take in this study and the subsequent use of data collection strategies and analysis methods.

## Use of Grounded Theory Tools

"Grounded theory is a qualitative strategy in which the researcher derives a general, abstract theory of a process, action or interaction grounded in the views of participants in a study" (Creswell, 2009, p. 229). This approach takes a grounded view of the data that uses the results to determine the direction of the study as the theory emerges. According to Charmaz (2006, pp. 3 - 4), researchers using grounded theory begin with the data. They collect the data through observations, interactions with people, interviews, useful materials and documents that they find in the natural settings encountered during the research process. The data are then analysed and categorised, and then more data are collected to help refine and check the emerging theory. The study produces a grounded theory, which outlines the researcher's understanding of the experience that they have studied.

Some grounded theory tools were used by the researcher during the study in conjunction with the process of emergent design, which is central to the grounded theory approach (Charmaz, 2006, p. 48). The data that were collected and analysed during Phase One were rich in information, which helped to guide the modification of the research question and the subsequent approach which was taken for Phase Two. The analysis of the data for Phase Two lead to the addition of Phase Three so that the theoretical saturation point could be reached (Bell, 2010, p. 17) (see Figure 3.2 – Emergent Design of the Three Phases). The theory then ultimately emerged from the data that was collected in all three phases. More information about the data analysis methods has been explored later in this chapter.

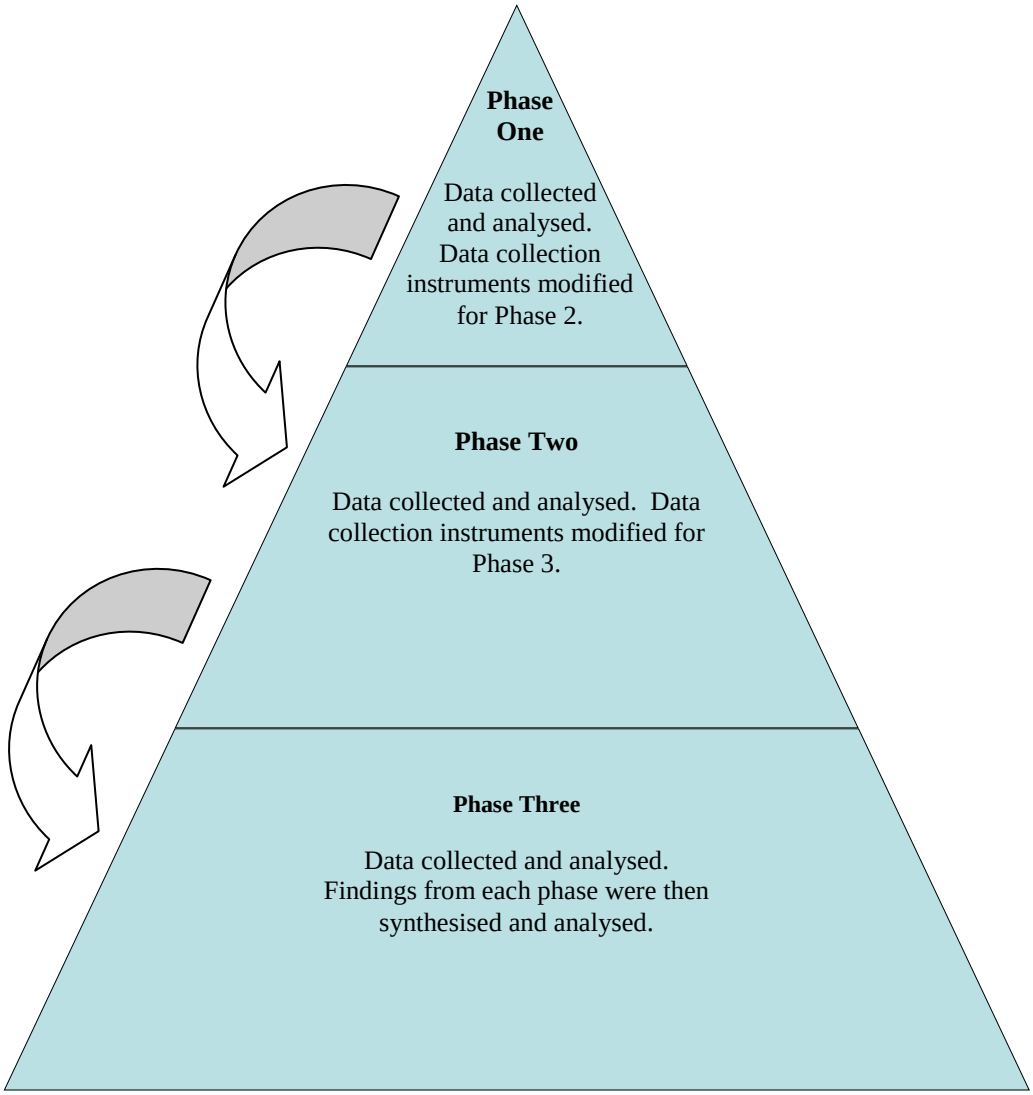


*Figure 3.2.* Emergent Design of the Three Phases

## Evaluation Criteria – Reflexivity, Confirmability and Validity

The nature of qualitative research is not purely objective and, as a result, it is essential for the researcher to consider their reflexivity in relation to the study (Lichtman, 2010, p. 120). The researcher is a pre-service primary teacher in the fourth year of her

course, and is currently studying at Avondale College of Higher Education. She had previously witnessed the success of integrated movement-based activities in the primary classroom and this study was based on her intention to find out more about the impact of these activities on primary students. However, throughout this study the researcher worked at maintaining neutrality by collecting data from a variety of different perspectives other than her own (Patton, 2002, p. 159).

To conduct research on this topic the researcher chose two schools to which she had no prior connection. During Phase One and Phase Three of the study the researcher collected data while teaching the students as a pre-service teacher. As a result she had a rapport with the students and developed a professional relationship with the supervising teacher. However, for Phase Two the researcher had no previous connection with the school, the supervising teachers or the students in the class and observed the movement-based activities as a complete observer. Collecting data from this source helped to maintain the neutrality of the research.

The researcher was rigorous in systematically collecting and analysing data. The data were collected from the perspectives of the researcher, the teachers and the students and were then analysed using triangulation. This rigorous approach to analysis increased the credibility of the results (Patton, 2002, p. 569). Patton (2002, p. 570) explains that the trustworthiness of the data is also essential in maintaining validity during a research study. Validity is an essential part of research and involves making sure that the data collection and analysis procedures correctly and comprehensively address the research question (Mason, 2002, p. 39). Validity includes a consideration of rigour, credibility, trustworthiness and confirmability.

To increase the trustworthiness of the data in Phase Two the researcher conducted a member check at the end of each interview during which the participants had the opportunity to modify what had been recorded by the researcher (Lincoln & Guba, 1985, p. 314). Also in Phase One and Phase Three the researcher used a process of prolonged engagement to increase the trustworthiness of the data (Boudah, 2011, p. 78). Lincoln and Guba (1985, p. 323) explain that it is also essential to consider the confirmability of the results when assessing trustworthiness. This involves ensuring that the theory is deeply grounded in the data and has truly emerged from the results of the study. The researcher achieved this by utilising the grounded theory tools, where the design of the data collection instruments used in each phase of the study were based on the results from the previous phase (see Figure 3.2 – Emergent Design of the Three Phases).

## Data Collection Methods

Data collection involved the use of both qualitative and quantitative methods. Qualitative data were collected in three different ways including:

- guided self reflection journals written by students;
- the teachers' observations of the class and experience with movement-based activities; and
- the researcher's observations of the class.

Quantitative data were collected in the form of:

- two timed numeracy tests in Phase One: and
- a self-rating scale concentration diary used in Phase One and Phase Three.

These data collection instruments were used in each of the study's phases and are further described in the following paragraphs. This process was designed to attempt to answer the question:

> How do integrated movement-based activities impact on primary school aged students in the classroom?

The data collection instruments were also designed to answer these subsidiary questions:

- What is the specific impact of movement-based activities on students' concentration, enjoyment and engagement in learning?
- How do movement-based activities impact on students' interpersonal relationships?
- How does the classroom environment affect the use of movement-based activities?

**Phase One**

In Phase One four different types of data collection instruments were designed and administered including:

- a student self-rating scale of concentration;
- a student guided self-reflection journal;
- a timed student numeracy test; and
- teacher-researcher reflections.

The self-rating scale in the form of a concentration diary was used in Phase One to determine the students' own perceived concentration levels (see Appendix 3.8 – Sample Student Self-rating Scale of Concentration). A ten point numerical rating scale was used with two "anchored end points" (Johnson & Christensen, 2010, p. 172). The two anchored end points indicated a low/poor level of concentration ranging through to a high/perfect level of concentration. This self-rating scale was completed three times every day: just before the students went out on the first break of the school day; just before the second break; and then again just before the students went home at the end of the day.

A guided self-reflection journal (see Appendix 3.9 and 3.10 – Guided Self-Reflection Journals) was given to the students for ten minutes before the movement-based activities had been introduced, and at the end of Phase One after the movement-based activities had been introduced. The guided self-reflection journal given at the end of Phase One included the same questions from the earlier journal but also incorporated more questions which were specifically related to the movement activities such as:

- Do you think that having more moving activities in the classroom this week has helped you to concentrate better?
- Did you enjoy the moving activities that we did in class this week? Why or why not?

These types of questions were asked to encourage the students to reflect on how the integrated movement-based activities impacted on them.

A timed numeracy test (see Appendix 3.11 – Timed Numeracy Test) was given to the students at the beginning of Phase One before movement-based activities were introduced, and also at the end of Phase One after the movement-based activities had been integrated into the curriculum. This test was based on the NSW Board of Studies K-6 Mathematics Syllabus (Board of Studies NSW, 2002) and the questions were designed to be mentally calculated and then recorded by the students in the class so that the activity could be integrated into a regular mathematics lesson.

Some examples of the questions in the numeracy test included

- 15 – 6 =
- 12 + 7 =
- $81 ÷ 9 =
- 6 x 9 =

The researcher used the results from these tests to compare completion times from the two tests and also the scores that each student achieved. The average class scores and completion rates were also calculated. These results were used to determine if the students' attention span changed as a result of the movement-based activities.

At the end of Phase One, the researcher wrote personal reflections on her experience as the students' teacher. During these reflections, she analysed the impact of the integrated movement-based activities on the students and their learning and the external events that may have affected the results of the study, and identified any possible changes that needed to be made to the study. These reflections were conducted from a participant-as-observer standpoint. According to Creswell (2009, p.

179) this type of observation is beneficial because interesting aspects to the study can be documented during the constant and systematic observation.

**Phase Two**

In Phase Two three different types of data collection instruments were designed and administered:

- classroom observations by researcher;
- teacher interviews; and
- a student concentration diary/guided self-reflection journal.

Detailed observations in the kindergarten classroom were made by the researcher for a week in Phase Two (see Appendix 3.12 – Sample Kindergarten Observations). During the morning, over a four day period of time, the concentration levels of the class as a whole were rated by the researcher every two minutes on a scale of one (low concentration levels) to five (high concentration levels) and general observations were also made based on the results from the coding and analysis conducted in Phase One. All the movement-based activities and the resources used for them were recorded, and it was also noted whether or not the movement-based activities were integrated into the primary curriculum. These observations were recorded from the point of view of a complete observer (Creswell, 2009, p. 179). This was a beneficial approach for this phase of the study because the researcher was able to make observations about the concentration levels of the class in a much more detailed way than if the researcher was also the teacher.

The researcher also conducted semi-structured interviews with the two teachers who regularly taught this class (see Appendix 3.13 – Sample Teacher Interview). The questions were constructed prior to the interview and were designed to be open-ended to encourage the participants to share their knowledge and experience without being restrained (Creswell, 2008, p. 225). Some examples of the questions used in the interviews included:

- Why do you use movement-based activities in your classroom?
- How would it impact your classroom if you stopped doing movement-based activities?

Appropriate probing sub-questions were also asked during the interview to gain a more in depth understanding of the topic and to clarify the questions where necessary (Creswell, 2008, p. 229). Some examples of the sub-questions included:

- Could you tell me more about that?
- What are some other ways that movement-based activities have impacted on your students?

Two interviews were conducted with one of the classroom teachers and the researcher was also able to interview the other classroom teacher on one occasion. The teachers' responses during the interview were recorded by the researcher who took notes electronically using a laptop computer. Notes to record the teachers' responses were written during the interview. At the end of the interview the researcher conducted a member check in which the teacher was asked to read over the notes and check that they conveyed the teacher's intended meaning. Amendments were then made to the phrasing of the sentences to reflect the teacher's desired response. This process of

member checking is “a most crucial technique for establishing credibility” (Lincoln & Guba, 1985, p. 314).

The original guided-reflection journal and concentration diary used for Phase One of the study were modified to suit the kindergarten class in Phase Two (see Appendix 3.14 – Self-Rating Scale of Concentration Phase Two). Aspects were taken from both the concentration diary and the guided self-reflection journal, to create one short booklet to accommodate the participants’ younger age and to make the data more trustworthy. Three questions were asked in the booklet that were based on the themes that had arisen from the guided self-reflection journals from Phase One. These questions were:

- Did you think well today?
- Did you have fun today?
- Did you finish all your class work today?

The students answered these questions using a simple picture-based rating scale involving a diagram of a smiley face to indicate yes/good, a neutral face and a face with a frown to indicate no/bad. A three point rating scale was chosen for this journal instead of the ten point rating scale used in Phase One, because this format with less text had been proven to be easier for young children to understand (Anderson & Arsenault, 1998, p. 174). This diary was completed two times over the period of one week as the observations of the classroom were taking place.

**Phase Three**

In Phase Three, three different types of data collection instruments were designed and administered including:

- a student self-rating scale of concentration;
- a teacher-researcher rating of general classroom concentration; and
- teacher-researcher observation and reflections.

During Phase Three, the teacher-researcher gave the Year 5 students the same self-rating scale of concentration that was used in Phase One (See Appendix 3.8 – Sample Self-Rating Scale of Concentration), to once again rate their own concentration levels three times a day for six weeks. During this phase the teacher-researcher also rated the concentration levels of the class as a whole at the same time that the students completed the scale individually, to make sure that the findings were defensible (Johnson, 1997).

The researcher also wrote daily reflections over a period of six weeks while acting as the classroom teacher during her practicum. These reflections noted when movement-based activities occurred and what observable impact, if any, they had on the students. These results were compared to the concentration diary ratings of the students to check for any connections between the amount of movement-based activities and the average concentration levels of the class. This increased the credibility of the results as the teacher-researcher was able to verify whether the students were responding realistically about their perceived concentration levels.

Over the three phases of data collection the researcher made observations as both an observer/participant and as a complete observer. Data were also collected from the perspective of the students through concentration diaries, guided self-reflection journals and timed numeracy tests and the views from the classroom teachers were also sought. These data collection instruments are summarised in the following table (see Table 3.4 – Data Collection Instruments).

Table 3.4
*Data Collection Instruments*

| | Observations with Researcher as Observer/ Participant | Observations with Researcher as Complete Observer | Student Guided Self Reflection Journal | Guided Self-Reflection Journal | Timed Numeracy Test | Teacher Interviews |
|---|---|---|---|---|---|---|
| Phase One | ✓ | | ✓ | ✓ | ✓ | |
| Phase Two | | ✓ | ✓ | ✓ | | ✓ |
| Phase Three | ✓ | | ✓ | | | |

## Data Analysis

### Phase One

The students' answers to the guided self-reflection journal questions were analysed using grounded theory tools for coding. "Coding is the process of organizing the material into chunks or segments of text in order to develop a general meaning of each segment" (Creswell, 2009, p. 227). Creswell (2009, p. 175) goes on to explain that coding as a part of the grounded theory approach includes the process of inductive data analysis. This involves studying the data and working backwards and forwards between the whole collection of data and the codes/themes which are being created. This rigorous process allows for the information to be placed into groups

which are grounded in the data. The groups become more and more abstract until the core theme and essence of the data emerges. This was the technique used by the researcher to analyse the guided self-reflection journals (see Figure 3.3 – Example of the Open Coding Process Used to Analyse the Phase One Guided Self-reflection Journals**)**.

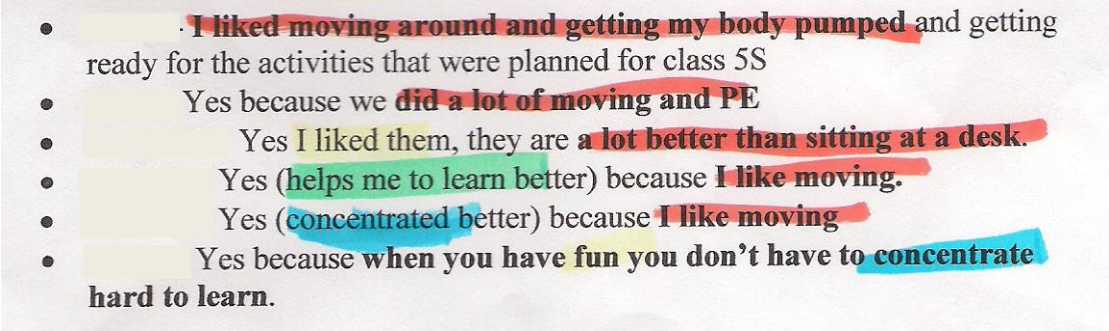
- **I liked moving around and getting my body pumped** and getting ready for the activities that were planned for class 5S
- Yes because we **did a lot of moving and PE**
- Yes I liked them, they are **a lot better than sitting at a desk**.
- Yes (helps me to learn better) because **I like moving.**
- Yes (concentrated better) because **I like moving**
- Yes because **when you have fun you don't have to concentrate hard to learn**.

*Figure 3.3.* Example of the Open Coding Process Used to Analyse the Phase One Guided Self-reflection Journals

In this study the researcher purposely used the constant-comparative method of coding as a part of the grounded theory approach. The three levels of coding include open, axial and selective coding (Lichtman, 2010, p. 190). According to Cohen, Manion and Morrison (2007, p. 493), the first step is open coding and this process involves working with the original data and analysing it so that it can be put into meaningful categories. This often involves using the words that the participants have used, which is called *'in vivo'* coding (Creswell, 2009, p. 186). Cohen et al (2007, p. 493) continue to outline that axial coding is the second step and it involves analysing the categories that have been created, finding links between them and merging them together into more specific and abstract groups. Finally, the last step in the coding process is selective coding where the central category is identified, compared to the

other categories and then compared with the existing theory (see Figure 3.4 – Selective Coding of Phase One Guided Self-reflection Journals).

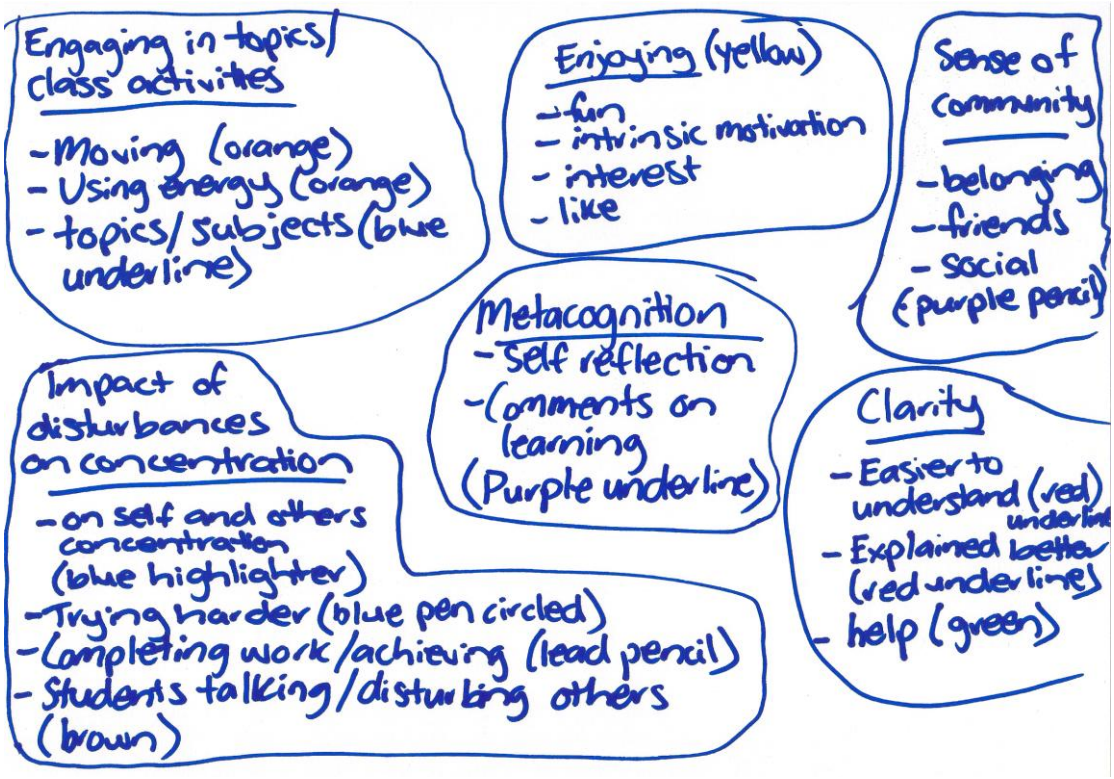


*Figure 3.4.* Selective Coding of Phase One Guided Self-reflection Journals

The researcher undertook this process of open coding by firstly grouping the students' answers into broad categories with other student answers that were similar. Secondly, the researcher highlighted the key *'in vivo'* words in each group, using a specific colour for each theme. This ensured the participants' voices were faithfully represented throughout the data analysis process. These coloured themes were then given category names as a part of the axial coding stage. During this stage, the emerged themes were compared and linked to establish connections between the findings from the varied data analyses. Finally, the researcher conducted selective coding by analysing these categories and collapsing them into more succinct groups

identified themes and identifying the connections between the themes (see Figure 3.4 – Selective Coding of Phase One Guided Self-reflection Journals). This systematic coding approach allowed the researcher to constantly compare the data and create content rich categories that eventually lead to the emergence of a theory.

The reflective comments made by the researcher at the end of Phase One were analysed using the same coding technique that was used for the responses to the guided self-reflection journals.

To supplement the qualitative data analysis, quantitative data were also collected and analysed. The data from the student self-rating scales of concentration were collected and entered into a spreadsheet which allowed the researcher to conduct descriptive statistical calculations to find the mean concentration level for each student per day and the overall mean of their concentration levels over the course of the study for each day in the morning, midday and afternoon periods. The spreadsheet allowed the researcher to highlight any patterns in concentration levels and to determine whether the occurrence of the movement-based activities had any impact on the concentration ratings of the students. For example, those students highlighted in Figure 3.5 showed a consistent increase in their average daily concentration ratings over the week of data collection (see Figure 3.5 – Phase One Self-Rating Scale Concentration Diary Data Analysis).

| | Day 1 | | | Average | Day 2 | | | Average | Day 3 | | | Average | Day 4 | | | Average | Day 5 | | | Average | | Morning Average | Mid-day Average | Afternoon Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Student 1 | | | | | 3 | 10 | 10 | 7.7 | 8 | 7 | 8 | 7.7 | 9 | 6 | 10 | 8.3 | 9 | 9 | 10 | 9.3 | | 7.3 | 8.0 | **9.5** |
| Student 2 | 7 | 8 | 8 | 7.7 | 6 | 7 | 7 | 6.7 | 6 | 4 | 6 | 5.3 | 8 | 9 | 7 | 8.0 | 8 | 8 | 6 | 7.3 | | 7.0 | **7.2** | 6.8 |
| Student 3 | 9 | 10 | 10 | 9.7 | 9 | 10 | 8 | 9.0 | 9 | 9 | 7 | 8.3 | 10 | 9 | 10 | 9.7 | 10 | 10 | 8 | 9.3 | | 9.4 | **9.6** | 8.6 |
| Student 4 | 9 | 10 | 9 | 9.3 | 8 | 9 | 9 | 8.7 | 10 | 9 | 7 | 8.7 | 7 | 10 | 9 | 8.7 | 9 | 9 | 9 | 9.0 | | 8.6 | **9.4** | 8.6 |
| Student 5 | 7 | 9 | 8 | 8.0 | 8 | 8 | 8 | 8.0 | 10 | 9 | 6 | 8.3 | 9 | 8 | 10 | 9.0 | 9 | 8 | 10 | 9.0 | | **8.6** | 8.4 | 8.4 |
| Student 6 | 9 | 8 | 10 | 9.0 | 7 | 9 | 8 | 8.0 | 9 | 7 | 4 | 6.7 | 10 | 8 | 10 | 9.3 | 10 | 8 | 6 | 8.0 | | **9.0** | 8.0 | 7.6 |
| Student 7 | 7 | 8 | 8 | 7.7 | 9 | 7 | 8 | 8.0 | 8 | 9 | 7 | 8.0 | 10 | 7 | 10 | 9.0 | 10 | 9 | 8 | 9.0 | | **8.8** | 8.0 | 8.2 |
| Student 8 | 9 | 8 | 9 | 8.7 | 9 | 8 | 9 | 8.7 | 9 | 9 | 8 | 8.7 | 8 | 9 | 9 | 8.7 | 10 | 9 | 8 | 9.0 | | **9.0** | 8.6 | 8.6 |
| Student 9 | 6 | 9 | 2 | 5.7 | 1 | 8 | 10 | 6.3 | 4 | 4 | 8 | 5.3 | 6 | 4 | 8 | 6.0 | 10 | 4 | 6 | 6.7 | | 5.4 | 5.8 | **6.8** |
| Student 10 | 9 | 8 | 9 | 8.7 | 7 | 8 | 10 | 8.3 | 9 | 9 | 8 | 8.7 | 8 | 9 | 7 | 8.0 | 9 | 9 | 9 | 9.0 | | 8.4 | **8.6** | 8.6 |
| Student 11 | 9 | 7 | 9 | 8.3 | 10 | 10 | 10 | 10.0 | 7 | 9 | 9 | 8.3 | 8 | 10 | 10 | 9.3 | 10 | 10 | 9 | 9.7 | | 8.8 | 9.2 | **9.4** |
| Student 12 | 7 | 9 | 10 | 8.7 | 8 | 7 | 9 | 8.0 | 7 | 9 | 5 | 7.0 | 7 | 10 | 8 | 8.3 | 10 | 8 | 9 | 9.0 | | 7.8 | **8.6** | 8.2 |
| Student 13 | 8 | 6 | 6 | 6.7 | 9 | 7 | 7 | 7.7 | 9 | 7 | 8 | 8.0 | 9 | 7 | 6 | 7.3 | 8 | 6 | 9 | 7.7 | | **8.6** | 6.6 | 7.2 |
| Student 14 | 9 | 9 | 9 | 9.0 | 10 | 10 | 10 | 10.0 | 9 | 9 | 8 | 8.7 | 7 | 8 | 9 | 8.0 | 10 | 10 | 10 | 10.0 | | 9.0 | **9.2** | **9.2** |
| Student 15 | 7 | 9 | 9 | 8.3 | 9 | 7 | 8 | 8.0 | 9 | 2 | 7 | 6.0 | 9 | 8 | 8 | 8.3 | | | | | | **8.5** | 6.5 | 8.0 |
| Student 16 | 6 | 10 | 9 | 8.3 | 8 | 8 | 9 | 8.3 | 4 | 7 | 9 | 6.7 | 4 | 9 | 8 | 7.0 | 9 | 6 | 6 | 7.0 | | 6.2 | 8.0 | **8.2** |
| Student 17 | 6 | 9 | 10 | 8.3 | 7 | 7 | 8 | 7.3 | 7 | 9 | 9 | 8.3 | 9 | 10 | 9 | 9.3 | 9 | 9 | 10 | 9.3 | | 7.6 | 8.8 | **9.2** |
| Student 18 | 9 | 10 | 10 | 9.7 | 6 | 9 | 4 | 6.3 | 9 | 10 | 10 | 9.7 | 6 | 9 | 10 | 8.3 | 5 | 8 | 10 | 7.7 | | 7.0 | **9.2** | 8.8 |
| Student 19 | 8 | 7 | 9 | 8.0 | 7 | 8 | 9 | 8.0 | 7 | 9 | 9 | 8.3 | 9 | 9 | 9 | 9.0 | 9 | 8 | 10 | 9.0 | | 8.0 | 8.2 | **9.2** |
| Student 20 | 8 | 7 | 8 | 7.7 | 6 | 9 | 9 | 8.0 | 9 | 8 | 9 | 8.7 | 9 | 7 | 10 | 8.7 | 9 | 8 | 10 | 9.0 | | 8.2 | 7.8 | **9.2** |
| Student 21 | 8 | 9 | 10 | 9.0 | 8 | 10 | 7 | 8.3 | 9 | 10 | 7 | 8.7 | 9 | 8 | 7 | 8.0 | 10 | 9 | 8 | 9.0 | | 8.8 | **9.2** | 7.8 |
| Student 22 | 8 | 10 | 9 | 9.0 | 8 | 9 | 8 | 8.3 | 8 | 9 | 9 | 8.7 | 7 | 9 | 10 | 8.7 | 7 | 8 | 10 | 8.3 | | 7.6 | 9.0 | **9.2** |
| Student 23 | 9 | 10 | 10 | 9.7 | 10 | 10 | 10 | 10.0 | 10 | 10 | 10 | 10.0 | 10 | 10 | 10 | 10.0 | | | | | | 9.8 | 10.0 | 10.0 |
| | | | | | | | | | | | | | | | | | | | | | | **6** | **8** | **9** |

*Figure 3.5.* Phase One Self-Rating Scale Concentration Diary Data Analysis

The data collected from the timed numeracy tests were entered into a spreadsheet and analysed using descriptive statistics. The students' results and the times they took to complete the tests were compared at an individual and a class level. This helped the researcher to discover if there was any change in the students' concentration levels at the end of the study after the movement-based activities had been integrated into the curriculum (see Table 3.5 – Timed Numeracy Test Analysis).

Table 3.5
*Timed Numeracy Test Analysis*

| | Week 1 Score | Week 1 Time | Week 2 Score | Week 2 Time |
|---|---|---|---|---|
| Student 14 | 42 | 2:08 | 41 | 1:54 |
| Student 21 | 41 | 2:08 | 39 | 2:12 |
| Student 3 | 39 | 2:25 | 38 | 1:54 |
| Student 12 | 39 | 4:12 | 40 | 4:10 |
| Student 11 | 38 | 4:12 | 39 | 3:32 |
| Student 6 | 37 | 2:48 | 37 | 2:11 |
| Student 13 | 37 | 6:45 | 35 | 4:55 |
| Student 17 | 37 | 6:45 | 39 | 5:13 |
| Student 9 | 36 | 6:20 | 40 | 8:35 |
| Student 4 | 36 | 6:45 | 40 | 4:16 |
| Student 2 | 36 | 3:19 | 36 | 3:07 |
| Student 16 | 34 | 16:31 | 36 | 11:10 |
| Student 5 | 33 | 8:18 | 32 | 7:18 |
| Student 23 | 32 | 5:00 | 30 | 4:32 |
| Student 10 | 32 | 15:00 | 38 | 11:00 |
| Student 24 | 32 | 8:08 | N/A | N/A |
| Student 19 | 31 | 10:58 | 33 | 6:26 |
| Student 8 | 30 | 5:32 | 34 | 3:53 |
| Student 1 | 29 | 7:40 | 36 | 7:00 |
| Student 18 | 26 | 9:28 | 22 | 6:43 |
| Student 15 | 24 | 14:36 | 27 | 8:50 |
| Student 22 | 23 | 10:02 | 25 | 6:25 |
| Student 20 | 37 | 3:19 | 38 | 2:38 |
| Student 7 | N/A | N/A | 35 | 4:05 |
| Averages | 33.82 | 7:13 | 35.22 | 5:18 |

The data analysis process conducted during Phase One informed the modification of the design of the data collection instruments used in Phase Two.

**Phase Two**

During Phase Two the researcher recorded systematic observations of the class on a daily basis for four days. These observations were analysed by using the coding process described above in Phase One.

Data gathered from the interviews with the teachers were then analysed in the same way as responses to the guided self-reflection journals in Phase One. The teachers' responses to the interview questions were coded using open coding (see Figure 3.6 – Example of the Process of Open Coding Used to Analyse the Teacher Interview

Responses), axial coding and selective coding (see Figure 3.7 – Selective Coding of Teacher Interview Responses), until a theory emerged. The open coding for the teacher interviews was completed electronically for efficiency, rather than completing it by hand using highlighters, which was the process used for the open coding of the guided self-reflection journals.

| | |
|---|---|
| Question 2<br><br>Do you normally integrate the movement-based activities or keep them non-integrated? | It is but it is not really planned to be integrated. It is based more on the multiple intelligences. Also I come from a special education background and the movements that go with words helps the slower learners to remember and learn. The kids learn so much quicker now. They need to have their frontal lobe stimulated and if you do not do it for them then they will by fidgeting, arguing or going to the toilet over and over. Usually this comes out in negative behaviour. There is not much negative behaviour in my classroom because they are always moving. The movement is the base. It is just a part of the learning style. It should be in everything. The learning activities help them to focus because it stimulates the brain. Everything is integrated. They are always moving for a purpose, which is to keep them moving and to stimulate their frontal lobes so that they can continue to focus on their work. |

*Figure 3.6.* Example of the Process of Open Coding Used to Analyse the Teacher Interview Responses

*Figure 3.7.* Selective Coding of Teacher Interview Responses

Data collected through the use of the simple concentration diary used in Phase Two were analysed by entering the data into a spreadsheet. These data were analysed using descriptive statistics to find the mean of the scores. The first journal was given on a day when a lot of movement-based activities were used, and the second journal was given on a day when very few movement-based activities were used. The answers that the students gave on the two separate occasions were compared to determine if there was a difference between the answers given on the two different days.

**Phase Three**

During Phase Three the same self-rating scale of concentration that was used in Phase One was given to the students and completed daily over a period of six weeks. It was analysed in the same way as the original concentration diary, using descriptive statistics (see Figure 3.8 –Analysis of the Phase Three Self-Rating Scale of Concentration). The sessions highlighted in yellow in Figure 3.8 indicate that a brain-break activity was used. The sessions highlighted in green in Figure 3.8 indicate that an integrated movement-based activity was used. To analyse these data, each student's mean concentration rating was calculated for each day and the general class mean score of concentration was also calculated for each session and compared to the researcher's rating of the concentration of the class as a whole for the same session. The researcher then recorded her own reflections each day which were compared to the results found in the students' self-rating scales of concentration.

Concentration Diary Data Week 3

| | 1/08/2011 | | | | 2/08/2011 | | | | 3/08/2011 | | | | 4/08/2011 | | | | 5/08/2011 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Day 1 | | | AV | Day 2 | | | AV | Day 3 | | | AV | Day 4 | | | AV | Day 5 | | | AV | Week AV | Morning Average | Mid-day Average | Afternoon Average |
| Students' names have been removed for confidentiality | 9 | 10 | | 9.5 | | | | | 8 | 9 | 10 | 9.0 | | | | | 8 | 9 | | 8.5 | 9.0 | 8.3 | 9.3 | 9.8 |
| | | | | | 8 | 6 | 7 | 7 | | | | | 7 | 5.5 | 6 | 6.2 | 6 | 8 | 6 | 6.67 | 6.6 | 7.0 | 6.5 | 6.3 |
| | 10 | 8 | 10 | 9.33 | 10 | 7 | 5 | 7.33 | 8 | 7 | 6 | 7.0 | 6 | 7 | 10 | 7.7 | 9 | 10 | | 9.5 | 8.2 | 8.6 | 7.8 | 8.2 |
| | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10.0 | 10 | 10 | 10 | 10.0 | 10 | 10 | 10 | 10 | 10.0 | 10.0 | 10.0 | 10.0 |
| | 9 | 9 | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9.0 | 9 | | | 9.0 | 9 | | | 9 | 9.0 | 9.0 | 9.0 | 9.0 |
| | 7 | 7 | 8 | 7.33 | 6 | 7 | 8 | 7 | 7 | 8 | 9 | 8.0 | 7 | 7 | | 7.0 | 6 | 7 | | 6.5 | 7.2 | 6.6 | 7.2 | 7.8 |
| | 6 | 8 | 8 | 7.33 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7.7 | 8 | 8 | 8 | 8.0 | 8 | 8 | 6 | 7.33 | 7.7 | 7.6 | 8.0 | 7.3 |
| | | | | | 8 | 9 | 9 | 8.67 | 8 | 8 | 9 | 8.3 | 8 | 8 | 9 | 8.3 | 8 | 8 | 9 | 8.33 | 8.4 | 8.0 | 8.3 | 8.9 |
| | 9 | 10 | 10 | 9.67 | 9 | 10 | 10 | 9.67 | 8 | 9 | 10 | 9.0 | 9 | 7 | 10 | 8.7 | 10 | 10 | 8 | 9.33 | 9.3 | 9.0 | 9.2 | 9.5 |
| | 9 | 9 | 8 | 8.67 | 7 | 9 | 9 | 8.33 | | | | | | | | | | | | | 8.5 | 8.0 | 9.0 | 8.5 |
| | | | | | | | | | 8 | 9 | 8 | 8.3 | 9 | 9 | 9 | 9.0 | 10 | 10 | 9 | 9.67 | 9.0 | 9.0 | 9.3 | 8.7 |
| | | | | | | | | | 9 | 9 | 6 | 8.0 | 9 | 8 | 9 | 8.7 | 9 | 8 | 9 | 8.67 | 8.4 | 9.0 | 8.3 | 8.0 |
| | 8 | 8 | 9 | 8.33 | 9 | 9 | | 9 | 8.5 | 9 | 10 | 9.2 | 8 | 8 | 8.5 | 8.2 | 8 | 9 | 8 | 8.33 | 8.6 | 8.3 | 8.6 | 8.8 |
| | 4 | 6 | 8 | 6 | 9 | 7 | 9 | 8.33 | 8 | 7 | 6 | 7.0 | 7 | 9 | 7 | 7.7 | 8 | 6 | 7 | 7 | 7.2 | 7.2 | 7.0 | 6.9 |
| | 8 | 8 | 8 | 8 | 9 | 8 | 9 | 8.67 | 7 | 8 | 8 | 7.7 | 9 | 8 | 7 | 8.0 | 7 | 9 | 7 | 7.67 | 8.0 | 8.0 | 8.2 | 7.7 |
| | 7 | 10 | 9 | 8.67 | 8 | 7 | 9 | 8 | 5 | 4 | 8 | 5.7 | 8 | 7 | 9 | 8.0 | 7 | 10 | 7 | 8 | 7.7 | 7.0 | 7.6 | 8.1 |
| | 8 | | | 8 | 8 | 8 | 10 | 8.67 | 10 | 8 | 9 | 9.0 | 8 | 9 | 9 | 8.7 | 10 | 9 | 8 | 9 | 8.7 | 8.8 | 8.5 | 8.5 |
| | 8 | 8.58 | 8.8 | 8.45 | 8.43 | 8.14 | 8.62 | 8.4 | 8.1 | 8.13 | 8.33 | 8.19 | 8.13 | 7.89 | 8.58 | 8.2 | 8.31 | 8.73 | 7.83 | 8.34 | 8.3 | 8.2 | 8.3 | 8.3 |
| | 8 | 8 | 8 | 8 | 5 | 8 | 7 | 6.67 | 10 | 7 | 8 | 8.3 | 9 | 8 | 8 | 8.3 | 8 | 8 | 4 | 6.67 | 7.6 | 8 | 7.8 | 6.93333 |
| Comments | Brain break during morning math class. Integrated movement to the meter of the limerick poem in the mid day block. | | | | Concentration low during writing morning class (caused by group work) even though movement integrated through acting. | | | | Life Education excursion during morning block used brain break activities. PE during mid-day block. | | | | Movement in morning integrated into bible by physically ordering the plagues and into Maths with drawing number lines outside. Movement in afternoon while acting during drama. They were excited though so it reduced concentration. | | | | No integrated movement. Just movement to different classrooms for music and chapel. | | | | | | | |

Yellow represents a brain-break activity.
Green represents an integrated movement-based activity.

*Figure 3.8.* Analysis of the Phase Three Self-rating Scale of Concentration

## Conclusion

The data from this study were analysed in three separate phases. The results that emerged from Phase One helped to inform the development of the data collection instruments for Phase Two and the results from Phase Two helped to inform the development of Phase Three. Examples of the data analyses processes have been described in this chapter. Findings from these analyses are reported and discussed in the next two chapters. Answers to the research questions that guided this study, will also be addressed in the next two chapters.

# CHAPTER 4 – FINDINGS

This chapter outlines the key themes and findings that emerged from this study. The findings emerged from analyses of the data collected throughout the three phases:

- **Phase One:** Movement-based activities integrated into a Phase Three (Year 5) classroom.
- **Phase Two:** Movement-based activities observed in an Early Stage One (Kindergarten) classroom.
- **Phase Three:** Movement-based activities integrated into a Stage Three (Year 5) classroom.

In this chapter, the common themes that have emerged from an analysis of the data are identified and linked to the research questions. The findings from an analysis of the data sources listed above are also compared and contrasted to establish the relationships between the three phases. The main question that will be addressed is:

> How do integrated movement-based activities impact on primary school aged students in the classroom?

The findings will also answer these subsidiary questions:

- What is the specific impact of movement-based activities on students' concentration, enjoyment and engagement in learning?
- How do movement-based activities impact on students' interpersonal relationships?
- How does the classroom environment affect the use of movement-based activities?

## Emergent Themes

When the data were collected and collated, as outlined in the Methodology chapter, it became evident through the analysis process, that many of the emerging themes were common between the various data sources. These themes directly related to the impact that integrated movement-based activities had on the students in the three phases of the study. From the data analyses processes, examples have been selected to provide evidence of the following themes:

- the impact of movement-based activities on students' concentration;
- the impact of movement-based activities on students' enjoyment;
- the impact of movement-based activities on students' engagement in learning;
- the impact of movement-based activities on students' interpersonal relationships; and
- the impact of the classroom environment and structure on the use of movement-based activities.

These major themes (see Table 4.1 – Themes and the Supporting Data Sources) are described in this chapter and are linked to the research questions. Explanations of each theme will be informed by analysis of multiple sources of both qualitative and quantitative data. The specific findings from the analyses will also be outlined.

Table 4.1
*Themes and the Supporting Data Sources*

| Impact of: | Student Self-rating Scale of Concentration | Student Guided Self-reflection Journals | Numeracy Test | Researcher's Reflections and Observations | Teacher Interviews |
|---|---|---|---|---|---|
| Movement-based activities on concentration | ✓ | ✓ | ✓ | ✓ | ✓ |
| Movement-based activities on enjoyment | | ✓ | | ✓ | ✓ |
| Movement-based activities on engagement in learning | | ✓ | | ✓ | ✓ |
| Movement-based activities on interpersonal relationships | | ✓ | | ✓ | ✓ |
| Classroom environment and structure on the use of movement-based activities | | | | ✓ | ✓ |

## The Impact of Movement-Based Activities on Concentration

This theme emerged from analyses of data from all data sources, including the student self-rating scales of concentration, student guided self-reflection journals, numeracy tests, researcher's reflections and observations, and from the teacher interviews.

This was a consistent theme that emerged from all of the data analysis processes, which indicated strongly that movement-based activities did have an impact on

student concentration (see Table 4.2 – The Impact of Movement-based Activities on Concentration).

Table 4.2
*The Impact of Movement-based Activities on Concentration*

| | Student Self-rating Scale of Concentration | Student Guided Self-reflection Journals | Numeracy Test | Researcher's Reflections and Observations | Teacher Interviews |
|---|---|---|---|---|---|
| Concentration | Consistent increase of concentration for seven students (Phase One) | Impact on concentration of self and others<br><br>Students tried harder.<br><br>Students completed work and achieved good results. | Some improvement to test time and student accuracy (Phase One) | Improvement of concentration temporarily. | Students had better focus.<br><br>Students had more concentration<br><br>Students were less distracted |

Concentration levels exhibited by the students in their classrooms were observed during all phases of this study. During Phase One the primary students completed a self-rating scale of their perceived individual concentration levels three times a day for a week, while participating in integrated movement-based activities during class. Seven students in this class consistently improved their average concentration levels over the course of the week and the other students remained relatively stable. A longer period of time during this phase might have been required for more students to improve their concentration ratings. The ratings of one student who consistently improved their concentration during this phase of the study, is shown in Figure 4.1 (see Figure 4.1 – Average Concentration of Student 20).

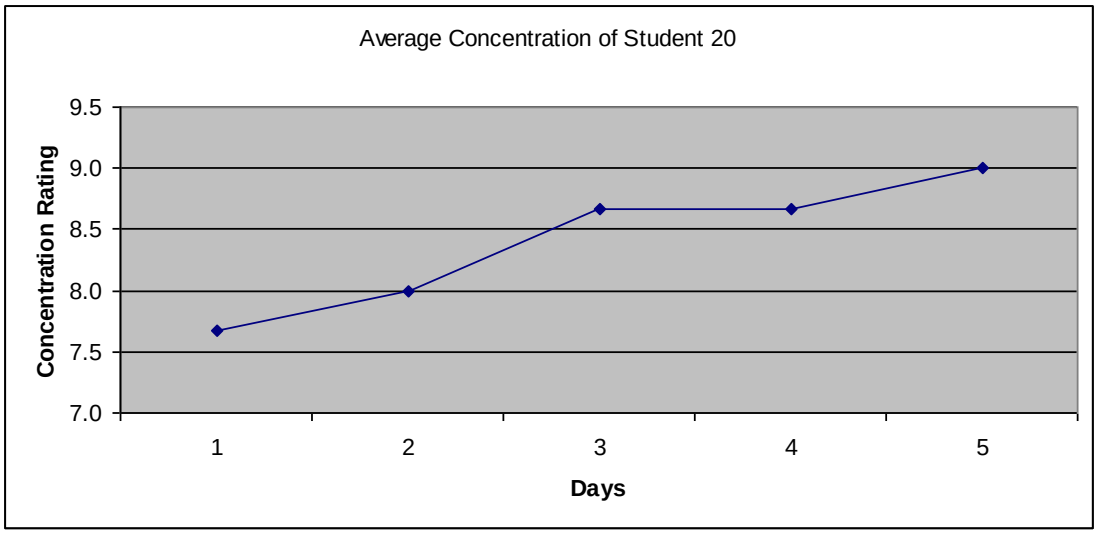


*Figure 4.1.* Average Concentration of Student 20

A simplified student self-rating scale of concentration was also given to the kindergarten students in Phase Two of the study. During the day when movement-based activities had been integrated into the curriculum, twenty-nine out of the thirty-one students who completed the picture-based rating scale indicated that they had been thinking well that day. In comparison, on the day that movement-based activities were not integrated into the curriculum, less students reported that they had been thinking well that day (see Figure 4.2 – Phase Two Student Self-Rating Scale Results). For example Student 2 and Student 7 indicated that they had concentrated well on the day that movement-based activities were integrated into the curriculum (shown by the yellow coding in Figure 4.2). However, on the day that movement-based activities were not integrated into the curriculum, these same students indicated that they had not concentrated well (shown by the red coding in Figure 4.2). This demonstrates that the students in Phase Two had improved concentration during the day that movement-based activities were integrated into the classroom.

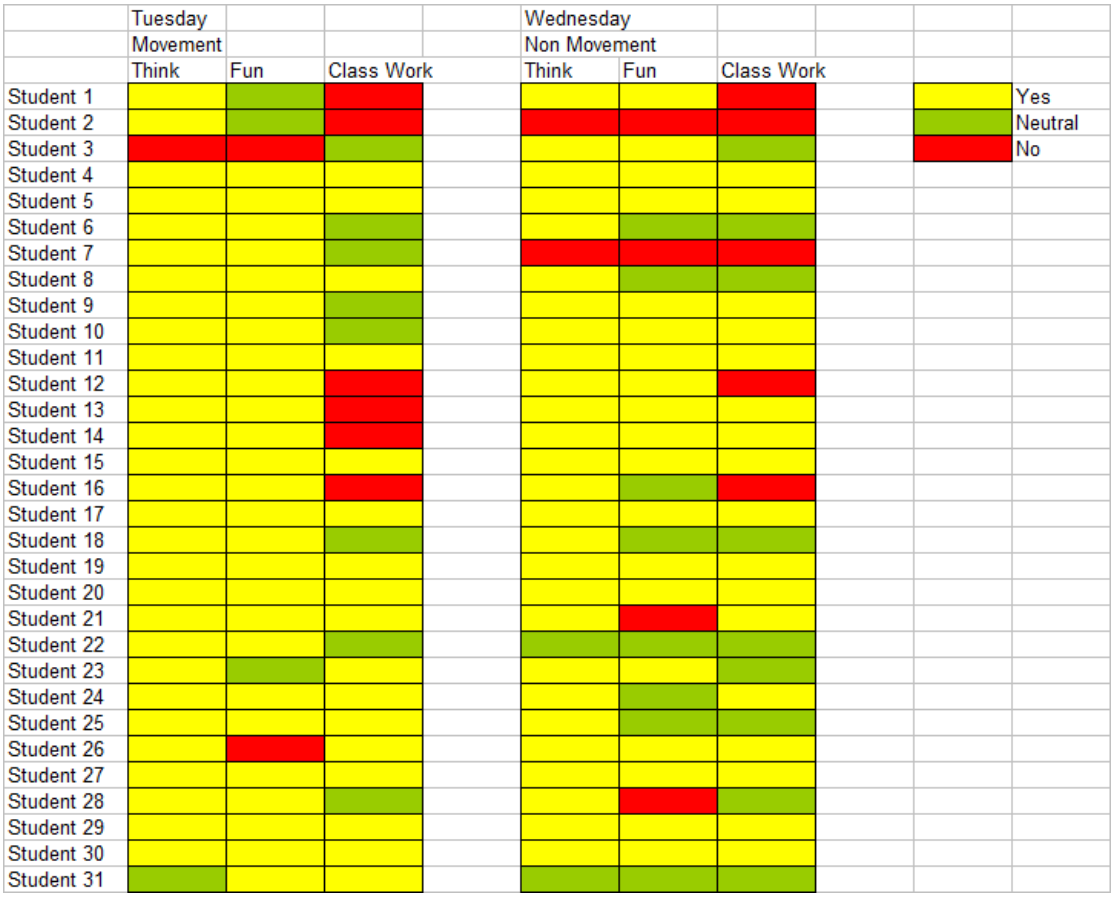


*Figure 4.2.* Phase Two Student Self-Rating Scale of Results

Both of the teachers who were interviewed as a part of Phase Two of the study strongly believed that movement-based activities help to increase the concentration levels of the students in their kindergarten classroom based on the evidence they had seen. When the researcher asked Teacher 1 why she used movement-based activities in her classroom on a particular day, she said:

> *"Just to get them to focus. They were really unsettled this morning because they were tired and it freshened them up so that they could concentrate again."*(Teacher 1, Phase Two)

This finding was reinforced by the analysis of the researcher's observations in the kindergarten classroom. At 9.15 am that morning, the researcher rated the students

four out of five for their group concentration level. However, after Teacher 1 asked the students to go outside and do the action related to the new sound they had learnt to read, the students settled down and their concentration levels were once again rated as five out of five by the researcher. Teacher 2, who team teaches in the same kindergarten classroom, said that if she removed movement-based activities from the classroom her students:

> *"... probably wouldn't be able to concentrate for as long. As a result they would not learn as much".* (Teacher 2, Phase Two)

In their responses to the guided self-reflection journals as a part of Phase One of the study, the students also described their concentration levels and related them to how much how much work they had completed. Student 12 wrote:

> *"I really think that in a way this has helped me. After we did those activities I was laughing and smiling. Therefore I was willing to concentrate deeply on my work."* (Student 12, Phase One)

Six other students also showed an improvement in their perceived concentration levels after movement-based activities had been introduced. The responses from these six students are shown below (see Table 4.3 – Students' Guided Self-Reflection Journal Question Response to "How well do you feel you have concentrated in class this week? Why?").

Table 4.3
*Students' Guided Self-Reflection Journal Question Response to:*
*"How well do you feel you have concentrated in class this week? Why?"*

| | **Pre-Movement Integration** | **Post-Movement Integration** |
|---|---|---|
| Student 9 | I feel that I have not concentrated that hard this week. | I feel I have been concentrating fairly hard this week. |
| Student 5 | Bad because I had a lot of things on my mind. | Good |
| Student 1 | Not very much because I have been playing around and talking too much. | Pretty well because of finished class and home work. |
| Student 3 | While Mrs Nalder has been teaching I have felt more energised so I have been able to work with a fresh mind. | I have concentrated better with the moving activities. |
| Student 21 | Yes I concentrated not quite as much as I can but I still think I concentrated still pretty good. | I think I have concentrated much better than usual. |
| Student 7 | Very well I think. | I have concentrated heaps better. |

During Phase Three of the study, while teaching, the teacher-researcher observed that a couple of students would always lose focus half way through the weekly mathematics test and stop looking at and writing on their test paper. When the teacher-researcher noticed that this was happening she gave the same students a brain-break activity to do. After this movement-based activity, the previously unfocused students would always regain a high level of concentration for a certain period of time.

The statistics from the timed numeracy tests in Phase One of the study also show that after movement-based activities had been integrated into the classroom,

improvements occurred in both the mean class scores and the mean class time to complete the test. During week one, the students obtained a mean score of 33.82 out of forty-two and this increased in week two to a mean of 35.22 out of forty-two. On average the students also improved in the time that it took to complete the test. In week one, the mean score showed that in general the students took seven minutes and thirteen seconds to complete the test, but during the second week this time had reduced to be five minutes and eighteen seconds (see Table 4.4 - Student's Timed Numeracy Test Results - Before and After Movement Integration). Although the increase in mean scores and the decrease in the mean time taken to complete the test were not substantial, when considered together, these changed scores both indicated a gradual improvement in the children's performances.

Overall, the findings from the three phases describe a positive impact on student concentration levels following the introduction of the movement-based activities.

Table 4.4
*Student's Timed Numeracy Test Results - Before and After Movement Integration*

| | Week 1 Score | Week 1 Time | Week 2 Score | Week 2 Time |
|---|---|---|---|---|
| Student 14 | 42 | 2:08 | 41 | 1:54 |
| Student 21 | 41 | 2:08 | 39 | 2:12 |
| Student 3 | 39 | 2:25 | 38 | 1:54 |
| Student 12 | 39 | 4:12 | 40 | 4:10 |
| Student 11 | 38 | 4:12 | 39 | 3:32 |
| Student 6 | 37 | 2:48 | 37 | 2:11 |
| Student 13 | 37 | 6:45 | 35 | 4:55 |
| Student 17 | 37 | 6:45 | 39 | 5:13 |
| Student 9 | 36 | 6:20 | 40 | 8:35 |
| Student 4 | 36 | 6:45 | 40 | 4:16 |
| Student 2 | 36 | 3:19 | 36 | 3:07 |
| Student 16 | 34 | 16:31 | 36 | 11:10 |
| Student 5 | 33 | 8:18 | 32 | 7:18 |
| Student 23 | 32 | 5:00 | 30 | 4:32 |
| Student 10 | 32 | 15:00 | 38 | 11:00 |
| Student 24 | 32 | 8:08 | N/A | N/A |
| Student 19 | 31 | 10:58 | 33 | 6:26 |
| Student 8 | 30 | 5:32 | 34 | 3:53 |
| Student 1 | 29 | 7:40 | 36 | 7:00 |
| Student 18 | 26 | 9:28 | 22 | 6:43 |
| Student 15 | 24 | 14:36 | 27 | 8:50 |
| Student 22 | 23 | 10:02 | 25 | 6:25 |
| Student 20 | 37 | 3:19 | 38 | 2:38 |
| Student 7 | N/A | N/A | 35 | 4:05 |
| Averages | 33.82 | 7:13 | 35.22 | 5:18 |

## The Impact of Movement-Based Activities on Enjoyment

This theme emerged from analyses of data from the student guided self-reflection journals, the researcher's reflections and observations, and from the teacher interviews.

The connections between the varied themes, that emerged from the multiple data analysis processes, indicated that movement-based activities did have an impact on student enjoyment of learning (see Table 4.5 – The Impact of Movement-based Activities on Enjoyment).

Table 4.5
*The Impact of Movement-based Activities on Enjoyment*

| | Student Guided Self-reflection Journals | Researcher's Reflections and Observations | Teacher Interviews |
|---|---|---|---|
| Enjoyment | Movement-based activities are enjoyable.<br><br>Movement-based activities increase intrinsic motivation.<br><br>Movement-based activities increase student interest in a topic. | Students enjoyed participating in movement-based activities. | Most students enjoy moving with movement-based activities in class.<br><br>The students are happier when they are able to participate in movement-based activities. |

In general, the majority of students enjoyed participating in the movement-based activities in the classroom. In Phase One the researcher observed in her reflections that the students enjoyed participating in the movement-based activities that she planned. The researcher recorded this in her reflections on Phase One:

> *"I have discovered that primary students do not consider fun activities and classes to be work. Once I asked one of the students that I came in contact*

*with at the school, about her day. She told me that she had not done much work that day, but when I questioned her I discovered that she had actually done a lot of class work in 'fun' subjects such as art and sport."* (Researcher, Phase One)

The same opinion concerning the connection between "fun" subjects and school work was also suggested by the primary students in their guided reflection journals during Phase One. When the students were asked at the end of the week if they had completed more class work done than normal, Student 12 said:

*"Not really because we are always having so much fun."*
(Student 12, Phase One)

When Student 4 was asked if he had completed more class work than normal he said:

*"No, because we did activities."* (Student 4, Phase One)

Also when Student 3 was questioned about the movement-based activities he said:

*"I liked it because we got to miss out on a bit of work. It was fun and it got our brain working."* (Student 3, Phase One)

Even though the movement-based activities were designed to teach new concepts, the students did not believe that the activities were work because they enjoyed participating.

The findings from an analysis of the students' responses to the self-rating scale of concentration/guided self-reflection journal in Phase Two also indicated that the

students enjoyed class more when movement-based activities were integrated into the lessons. On one of the days that integrated movement-based activities were used by the teacher, twenty-six out of the thirty-one students indicated in their journals that they had enjoyed their day. On the one day that movement-based activities were not integrated into the curriculum, only nineteen out of the thirty-one students noted that they had enjoyed their day (see Figure 4.2 - Phase Two Student Self-Rating Scale Results). In her observations of these students in Phase Two, the researcher also noted this:

> *"9.15 am - Movement was used to teach a specific sound blend. All students really seemed to enjoy going outside to act out the sound. All the students' were laughing and enjoying themselves."* (Researcher, Phase Two)

An analysis of the teachers' interview data also reinforced the findings which emerged from an analysis of the students' self-rating scales and the researcher's observations. In her interview, Teacher 1 said that these students in general:

> *"Are happy, content and they want to come to school."*
>
> (Teacher 1, Phase Two)

She believed that this positive attitude that her students had towards school could be contributed in part to the movement-based activities she used in class. Overall, this data indicates that movement-based activities help to increase students' enjoyment of school and learning.

**The Impact of Movement-Based Activities on Engagement in Learning**

This theme emerged from analyses of data from the student guided self-reflection journals, the researcher's reflections and observations, and from the teacher interviews.

The connections between the varied themes that emerged from the multiple data analysis processes, indicated that movement-based activities had an impact on student engagement in learning (see Table 4.6 – The Impact of Movement-based Activities on Engagement in Learning).

Table 4.6
*The Impact of Movement-based Activities on Engagement in Learning*

| | Student Guided Self-reflection Journals | Researcher's Reflections and Observations | Teacher Interviews |
|---|---|---|---|
| Engagement in Learning | Students wanted to learn about subjects that involved the integration of movement-based activities.<br><br>The movement-based activities helped to prepare the students to learn.<br><br>Movement-based activities increased intrinsic motivation. | Students wanted to learn about subjects that involved the integration of movement-based activities. | Students recalled new concepts easier.<br><br>Students retained information easier.<br><br>Movement-based activities improve the students' ability to learn.<br><br>Movement-based activities help the teacher cater for every learning style.<br><br>Movement-based activities stimulate the brain. |

When students in this study were engaged in a learning experience that involved the integration of movement-based activities they displayed more concentration, a greater interest in the topic and exhibited intrinsic motivation to learn. The teachers who were

interviewed as a part of Phase Two of this study, both believed that movement-based activities helped their students to be more engaged in the learning process. Teacher 1 described how the movement-based activities helped to stimulate her students' brains:

> *"The learning activities help them to focus because it stimulates the brain… They are always moving for a purpose, and the purpose is to keep the students' moving and to stimulate their frontal lobes so that they can continue to focus on their work."* (Teacher 1, Phase Two)

Similarly, students in Phase One also reflected on this in their guided self-reflection journals. Student 3 said:

> *"It was fun and it got our brain working".* (Student 3, Phase One)

Student 12 said that:

> *"In my opinion I think it would be a good idea for more* [movement-based activities] *because it gets our body warmed up."* (Student 12, Phase One)

Student 17 also agrees by saying:

> *"It gets me refreshed."* (Student 17, Phase One)

The analysis of the data collected from the students during Phase One correlates with the analysis of the data collected from the teachers in Phase Two. Teacher 1 directly linked the stimulation of the brain to the students' level of engagement in their learning experiences. When talking about her students, Teacher 1 said that as a result of the movement-based activities that she used in class:

*"They are retaining information better, they are more focused, less distracted, and there are not many behavioural issues in my class."*

(Teacher 1, Phase Two)

According to Teacher 1, movement-based activities can also help students to achieve better academic results through higher levels of engagement:

*"The kids learn to read quickly and I believe that it is as a result of the movement activities and techniques. When I have talked to other teachers, in comparison to their students, my students seem to be up and reading quicker and the majority of my students are reading a year above their age already."*

(Teacher 1, Phase Two)

Teacher 2 explains this by saying:

*"The kids that are not visual learners can remember the phonograms better with the actions… Also some of the kids are kinaesthetic learners so it is important to cater for them and all the multiple intelligences."* (Teacher 2, Phase Two)

Overall, these analyses of multiple sets of data, as outlined above, provided evidence that movement-based activities helped to engage these students in learning by catering for a variety of different learning styles and stimulating the students' brains so that they can maintain focus for longer and have a greater degree of motivation.

### The Impact of Movement-Based Activities on Interpersonal Relationships

This theme emerged from analyses of data from the student guided self-reflection journals, the researcher's reflections and observations, and from the teacher interviews.

The connections between the varied themes, that emerged from the multiple data analysis processes, indicated that movement-based activities had an impact on students' interpersonal relationships (see Table 4.7 – The Impact of Movement-based Activities on Interpersonal Relationships).

Table 4.7
*The Impact of Movement-based Activities on Interpersonal Relationships*

| | Student Guided Self-reflection Journals | Researcher's Reflections and Observations | Teacher Interviews |
|---|---|---|---|
| Interpersonal Relationships | Movement-based activities increased the students' sense of belonging.<br><br>Movement-based activities were often more social. | The students enjoyed working in teams and communicating with each other. | Movement-based activities improved the social relationships between the students because they had to learn how to work together as a team.<br><br>Movement-based activities improved the students' relationships with their teacher because there were less behavioural management issues in the class. |

Movement-based activities often had an impact on the interpersonal relationships amongst the students. This theme was revealed throughout the analysis process during which the data from the student guided self-reflection journals, the researcher's reflections and observations, and the teacher interviews were analysed. The researcher noted in her reflections at the completion of Phase One that:

> *"The movement-based activities often involved working as a part of a team and the students enjoyed this type of work."* (Researcher, Phase One)

Both of the teachers who were interviewed in Phase Two also indicated that they had noticed the impact that movement-based activities had created on the interpersonal relationships between the students in their class. Teacher 1 said:

> *"I think that it* [movement-based activities] *frees them up, that they are happier, more relaxed and as a result they don't pick on each other as much… They are used to working in groups and the groups change every term as well, so that they interact with other people… There is also not much trouble in kindergarten with bullying."* (Teacher 1, Phase Two)

In her response as a part of the student guided-self reflection journal in Phase One, Student 24 indicated that she felt as if she belonged as a part of the class:

> *"I have enjoyed this week because when I get to school I feel like belonging there because everyone is nice to me so I am nice back."*
> (Student 24, Phase One)

Teacher 2 explained this phenomenon when she said:

> *"When they* [the students] *get up and move between groups they need to make sure that they are moving together. The movement-based activities involve team work and communication... It creates fewer problems between the children because they know that they are a part of a group and that they belong to that group."* (Teacher 2, Phase Two)

Teacher 1 also believed that the movement-based activities helped to improve the relationships that she had with her students:

> *"The children are definitely more relaxed with me as a result of the activities. The whole atmosphere is more relaxed. They are not scared or intimidated to approach me."* (Teacher 1, Phase Two)

She then added:

> *" I know that by getting up and moving them that they will settle down. Instead of disciplining them I move them. I do not have to use more discipline. I give them 'coffee' through movement. It's more positive between me and the kids this way. I don't have to get cross with them, I just recognise when they need to move."* (Teacher 1, Phase Two)

Generally, the movement-based activities that were used in this study helped to improve the interpersonal relationships between the students and their peers by creating a sense of belonging in the classroom. Through an interpretation of the data analysed during this study, the findings have shown that the movement-based activities improved the relationships between the teacher and the students.

## The Impact of the Classroom Environment and Structure on the Use of Movement-Based Activities

The connections between the varied themes, that emerged from the multiple data analysis processes, indicated that the classroom environment and structure did have an impact on the use of movement-based activities in the classroom (see Table 4.8 – The

Impact of the Classroom Environment and Structure on the Use of Movement-based Activities). This was an unexpected theme that emerged from analyses of data from the researcher's reflections and observations, and from the teacher interviews.

Table 4.8
*The Impact of Classroom Environment and Structure on the Use of Movement-based Activities*

| | Researcher's Reflections and Observations | Teacher Interviews |
|---|---|---|
| Classroom Environment and Structure | The teacher needs to establish the structure and routine needed for the movement-based activities to happen smoothly and have an impact on the students.<br><br>The impact of the movement-based activities was neutral and sometimes negative when the students did not do movement-based activities regularly. | A structure and behaviour management system needs to be established to enable movement-based activities to be effective. |

There are many ways that movement-based activities can impact on the students in a primary classroom. However, the effectiveness of these activities can be impacted by the classroom environment and structure. This conclusion was made as a result of the analysis of data gathered from the researchers reflections and observations, and the teacher interviews.

According to Teacher 1:

> *"*[The classroom] *needs to be very tightly structured and the behavioural systems and framework need to be in place… You have to establish the rules and boundaries for the movement activities so that it doesn't just become chaotic".* (Teacher 1, Phase Two)

Teacher 2 also agrees and in her interview said:

> *"They* [the students] *have to follow rules. It creates settledness in the classroom rather than the students just going off on their own. If we* [the teachers] *didn't have that structure in place then it would be chaos. If it was chaos then they (the students) wouldn't be able to hear and learn well."*
> (Teacher 2, Phase Two)

During Phase One and Phase Three of this study, the teacher-researcher observed the impact that the existing classroom environment and structure had on the effectiveness of the integration of movement-based activities. Since the students in this classroom did not usually participate in integrated movement-based activities prior to this study, there were no established structure or rules to support these activities. The researcher noted this in her reflections after Phase Three of the study had been completed:

> *"When I integrated movement-based activities into lessons I often observed that the students were more disruptive and sometimes less focused. This was because the students in the class were not used to doing movement-based activities. As a result the needed structure had not been established by the classroom teacher. I think that these integrated movement-based activities could have been more effective and had a greater impact on the students, if the structure and rules had been established in the classroom beforehand."*
> (Researcher, Phase Three)

As a result, the analysis of these data shows that it is essential for a supporting classroom environment and structure to be established before integrated movement-

based activities can have a positive impact on students and their learning. This structure could involve set roles for group work tasks and quiet signals to get the students' attention during the integrated movement-based activities.

## Conclusion

Overall, the findings of this study have shown that the use of integrated movement-based activities in the classroom can have a positive impact on students' concentration, enjoyment, engagement in learning and interpersonal relationships. The existing classroom environment and structure can also impact on the effectiveness of the integrated movement-based activities. These findings have emerged from an analysis of a variety of different data sources. Figure 4.3 shows how some common themes emerged from the analysis of the multiple sets of data gathered during this study (see Figure 4.3 – Overlapping Themes Established Through the Analysis Process). These findings will be discussed in more detail in the following chapter.

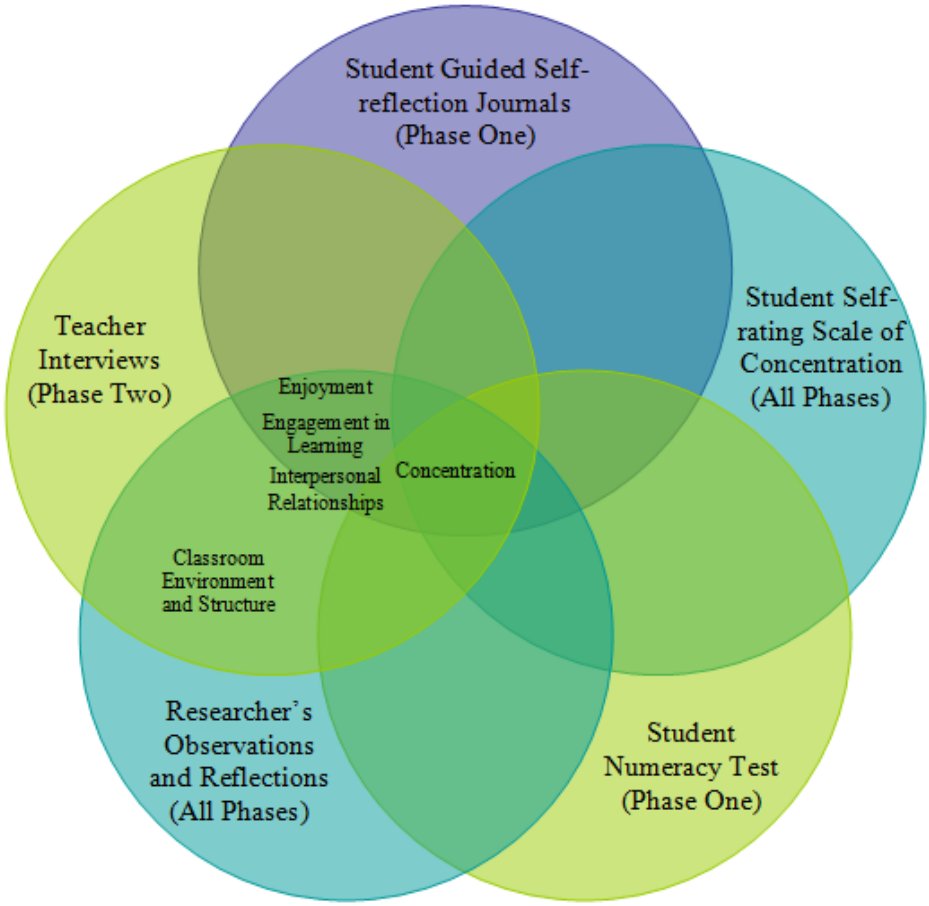


*Figure 4.3.* Overlapping Themes Established through the Analysis Process

# CHAPTER 5 – DISCUSSION

In this chapter the overall significance of the findings outlined in Chapter 4 will be discussed in relation to current research that was described in the literature review. The discussion will firstly answer the main research question:

> How do integrated movement-based activities impact on primary school aged students in the classroom?

The subsidiary questions will also be addressed and discussed:

- What is the specific impact of movement-based activities on students' concentration, enjoyment and engagement in learning?
- How do movement-based activities impact on the students' interpersonal relationships?
- How does the classroom environment affect the use of movement-based activities?

Finally, the chapter concludes with practical advice for teachers who intend to integrate movement-based activities into their classroom.

## How Do Integrated Movement-based Activities Impact on Primary School Aged Students in the Classroom?

Cosentino and Wyrzkowski (2007b, p. 15) have discovered that when students have an active lifestyle, they also concentrate better in classroom situations. According to

DiSisto (2002), many teachers in Australia and New Zealand also believe that including movement-based activities in physical education classes helps their students to concentrate better in class on academic studies. Movement-based programs such as Brain Gym International (2003) and Learning Connections (Hawke, 2007) have shown that their specialised brain-break activities, although not integrated into the primary curriculum, can help to improve students' concentration at school. Collectively, findings from these previous studies provide evidence that adding physical activities into the primary classroom curriculum can positively impact on students' learning. Nevertheless, there is no previous research that definitely shows whether *integrated* movement-based activities can also have an impact on students' concentration in a primary classroom.

The findings from this study show that when movement-based activities were integrated into the primary curriculum, the concentration levels of the students increased. The findings showed how the students tried harder to complete their work, improved their focus and were less distracted. By regularly integrating movement-based activities into the classroom, the students had the breaks that they required to help them to concentrate better. These findings provide further evidence to establish the connection between learning quality and integrated physical activity in the classroom.

The students in this study also enjoyed participating in integrated movement-based activities. Similarly, Purcell-Cone, Werner and Cone (2009, pp. 4-5) have discovered that interdisciplinary education increases students' enjoyment of a lesson. However, interdisciplinary education is not always linked to movement-based activities.

Previous literature has not linked enjoyment of learning to the use of integrated movement-based activities in the classroom. The findings of this study showed that the students from both lower and upper primary school enjoyed participating in the integrated movement-based activities and these activities helped to increase their interest in the topic being taught.

Movement-based activities can increase student engagement in learning. Jensen (2008) explains that movement can help to stimulate the brain as it increases blood circulation which allows nutrients to get to the brain faster. Research conducted using mice, by Van Pragg, Christie, Sejnowski and Gage (1999), also indicates that movement could help to improve mood and memory in humans. These studies focused on the physiological link between brain activity and classroom learning. Although the study documented in this thesis did not use methods which analysed physiological processes, the findings of this study do align with the findings of Jenson (2008) and Van Pragg et al. (1999) by illustrating how movement-based activities impact on students' behaviour, attitude and motivation.

When considered together with previous literature on movement-based activities, the findings from this study provide sets of significant observations regarding the observable impact of movement-based activities from a teacher's perspective and a researcher's point of view. The findings from this study showed that when primary school aged students were involved in integrated movement-based activities at school, they recalled information better and retained information more easily. The movement-based activities also increased the students' intrinsic motivation to learn. This

motivation was illustrated in this study by the students expressing their desire to learn about topics, especially if the subject involved integrated movement-based activities.

Movement-based activities can help to improve students' interpersonal relationships. Only a few researchers have investigated this aspect of movement-based activities (Di Sisto, 2002; Dodd, 2003; Hawke, 2007). Dodd (2003, pp. 2-3) outlines how students who were involved in a Daily Physical Education Program were found to have improved interpersonal relationships. DiSisto (2002) explains how the educators he interviewed often identified an improvement in the social skills of their students when they were regularly involved in physical education classes. In addition, Hawke (2007) indicates that the Learning Connections program can have a positive impact on children's social interactions. Similarly, this study has found that the integration of movement-based activities in primary classrooms improved the interpersonal relationships among the students. This occurred because the integrated movement-based activities often involved working as a part of a team and consequently promoted communication, team work and a sense of belonging.

A finding that emerged from this study that was not present in the literature was the impact that integrated movement-based activities could have on the interpersonal relationships between the teacher and the students. When movement-based activities were integrated into the primary-classroom, the students had better concentration, enjoyed their work more, were engaged more in what they were learning and had better interpersonal relationships with their peers. As a result their behaviour improved and the students did not create as many disturbances in the classroom. Consequently, the teacher did not have to introduce negative consequences for

inappropriate behaviour as often and this in turn improved the interpersonal relationships between the teacher and the students.

Although the impact of movement-based activities on teacher-student relationships has not been fully reported in previous literature, the findings from this study produce some evidence that the integration of movement-based activities can have a positive impact on the way in which students and teachers relate to each other.

Consequently, the findings of this study, in conjunction with previous literature, show that movement-based activities can have a positive impact on students' concentration, enjoyment of learning, engagement in learning and their interpersonal relationships with their peers and their teacher.

## The Impact of the Classroom Environment and Structure on the Use of Integrated Movement-based Activities in the Primary Classroom

The benefits of physical education classes and movement-based activities have been discussed in the literature (Cosentino & Wyrzkowski, 2007a; Davis, 2005; Di Sisto, 2002; Dodd, 2003). However, the impact that the classroom environment and structure can have on the effectiveness of integrated movement-based activities has not been previously researched. Previously reported literature focuses mainly on movement as a part of physical education classes (Di Sisto, 2002; Dodd, 2003), or on movement as a part of brain-break activities (Brain Gym International, 2003; Hawke, 2007; Jensen, 2008). The literature found concerning integrated movement-based activities (Lapere et al., 2008; Overby et al., 2005; Purcell-Cone et al., 2009) is

general and does not focus on the practical aspects of establishing a structure and routine to support the integration of movement-based activities in the primary classroom. Nevertheless, the findings from this study contribute to our understanding of this concept and begin to fill this gap in the literature.

This study found that it is essential for a classroom structure and routine to be created in the classroom before the integrated movement-based activities could have a positive impact on the students. The establishment of this structure and routine takes time and, as a result, the extent to which the integrated movement-based activities could have had a positive impact on the students during Phase One and Phase Three of this study was limited. However, during Phase Two the researcher was able to observe an existing structure and routine in a lower primary classroom and witnessed how it maximised the positive impact that the integrated movement-based activities had on the kindergarten students.

## Practical Recommendations for Primary Teachers

Findings from this study, in association with findings from the researched literature, indicate a set of practical recommendations for primary teachers. Primary teachers who desire to introduce integrated movement-based activities into their classrooms need to firstly plan a structure and routine which will support the activities and encourage and reinforce the correct behaviour for the students during the activity. This could include the development of set roles and the creation of a quiet signal to gain the students' attention during the integrated movement-based activities. The establishment of this structure will take time and the students will need to have a

chance to practise the process during many integrated movement-based activities across varied key learning areas, before the teacher may see any clear positive impact of the activity.

Secondly, based on the findings of this and previous studies, the researcher suggests that the primary teacher become familiar with some activities and strategies that could be used as integrated movement-based activities or brain-break activities to help develop a personal repertoire of practical strategies. There are some informative resource books, such as *Interdisciplinary Learning Through Dance: 101 Moventures* written by Overby, Post and Newman (2005), that give many examples of movement-based activities that could be used. The teacher could observe a colleague who is using integrated movement-based activities in their classroom. Other resources and ideas can also be obtained through contacting companies such Brain Gym International (2009) and Learning Connections (Hawke, 2007).

Thirdly, after beginning to introduce integrated movement-based activities into the primary classroom, it is important for the teacher to watch for behavioural indicators that could suggest a lack of concentration in the students. In this study the researcher observed that when students started to display a lack of concentration, the attention of the students' could be regained through the integration of a movement-based activity. Brain-break activities such as those created by companies such as Brain Gym International (2003) can also help to increase students' concentration.

## Conclusion

In this chapter the findings from this study have been related to the current literature. The findings from this study, when placed alongside the current literature, indicate some clear reasons why using integrated movement-based activities in the classroom has a positive impact on primary school aged students and their learning. When the supporting structure and routine has been established in the classroom, the integrated movement-based activities can help to improve students' concentration, enjoyment of the lessons, engagement in learning and their interpersonal relationships with their peers and with their teacher.

# CHAPTER 6 – CONCLUSION AND RECOMMENDATIONS

This study has examined how integrated movement-based activities impact on primary school aged students in the classroom. The major findings of the study, the strengths and limitations of the study and recommendations for future research are outlined in this chapter.

## Major Findings of the Research

By observing the impact of the movement-based activities in primary classrooms, the research documented in this study found that:

- Integrated movement-based activities helped to improve students' concentration.
- Integrated movement-based activities helped to improved students' enjoyment of learning.
- Integrated movement-based activities helped to engage students in learning.
- Integrated movement-based activities helped to improve students' interpersonal relationships with their peers and with their teacher.
- The environment and structure of the classroom impacted on the effectiveness of the use of integrated movement-based activities.

The findings of the study are significant because they show that integrated movement-based activities have many benefits for primary school aged students when they are integrated into the classroom. Although these findings are not necessarily generalisable to all primary school classroom contexts, the findings are offered for

interpretation by both school teachers and administrations who are interested in the impact of movement-based activities on primary school aged children.

## Strengths of the Research

There are many strengths of this study that contributed to the effectiveness of the research. Firstly, this study was based on an emergent design. This allowed the researcher to design the methodology and research process based on the results found from previous phases. Secondly, the mixed mode design of the study involved multiple methods. This ensured a variety of perspectives, including those of the students, the teachers and the researcher. Both upper (Year 5) and lower primary (Kindergarten) classrooms were studied in two different schools and the researcher took on different roles including that of a teacher-researcher and a researcher-observer. This allowed the findings to accurately represent how the integrated movement-based activities could impact on primary school aged students.

## Limitations of the Research

During Phase One and Phase Three, the impact that the integrated movement-based activities had on the students would have been more apparent if the study could have been done over a longer period of time. This would have provided the teacher-researcher with the additional time that was necessary for establishing the supporting classroom environment and structure over an extended time period. If such a study was conducted in the future, a time frame of between three to six months would be recommended.

The student self-rating scale of concentration that was used as a data collection instrument in Phase One and Phase Three was limited as the students were only asked to rate their concentration three times a day. As the researcher observed during Phase Two, the students' concentration levels fluctuated more regularly than three times a day. During Phase One and Three, these observations of concentration levels could have been done by an observer.

Finally, although the researcher intended for all the students to be consistently and actively involved in the integrated movement-based activities, a minority of students were not always engaged in the process. This could have had an impact on the data that was collected.

## Recommendations for Future Research

Future research could be done to further examine the impact of integrated movement-based activities in the primary classroom. Firstly, a similar longitudinal study could be conducted to identify the long term impacts of integrated movement-based activities on primary school aged students. Secondly, the learning outcomes of the students involved in the integrated movement-based activities could be analysed to determine if there was a specific academic impact on the students that could be linked to outcomes specified by the New South Wales syllabus documents. Thirdly, in this study both *non-integrated* brain-break activities and *integrated* movement-based activities were used and future research could be undertaken to determine whether or not there is a difference between the impacts that these two types of activities have on the students. Fourthly, these integrated movement-based activities could be studied as

a possible behaviour management strategy. Fifthly, a study could be conducted to discover if there is a gender difference in the way boys and girls respond to integrated movement-based activities. Finally, the unintended finding in this study concerning the connection between integrated movement-based activities and interpersonal relationships, could be studied in more detail. In all future research in these areas, the researcher suggests that a mixed mode methodology continue to be used, which incorporates a variety of perspectives to open up the differences in the impact on the students that could occur between the different ages of students in primary school classrooms.

## Conclusion

Integrated movement-based activities have an important positive impact on students in the primary classroom. These activities can help improve students' concentration, enjoyment of lessons, engagement in learning and interpersonal relationships. Integrated movement-based activities should be an integral part of all primary classrooms.

*"Adults need coffee to have the energy to continue with their busy lives. I give my students 'coffee' through movement."* (Teacher 1, Phase Two)

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**Appendix 3.1**
Ethics Clearance

Avondale
COLLEGE OF HIGHER EDUCATION

From the Office of the Vice President
(Administration and Research)
Email: vivienne.watts@avondale.edu.au
Tel: 02 4980 2120
Fax: 02 4980 2117

10 February 2011

Dr Maria Northcote
Faculty of Education & Science
Avondale College
PO Box 19
COORANBONG NSW 2265

Dear Maria

On Monday 29 November the Avondale College Human Research Ethics Committee met and approved the research application of Honours student Melissa Fowler, who is under your supervision, for the project titled: *The impact of integrated movement-based activities on primary students' attention span,* subject to changes to the application and appendices.

The Chair has reviewed the amended application and support documentation submitted and is satisfied with its content. Final approval is therefore granted for the project *The impact of integrated movement-based activities on primary students' attention span,* for the duration of the project till 31 December 2011. [project number 2010:34]

The additional standard conditions apply:

1. That you notify the committee of any changes to circumstances or research design, which might require a review of the ethics approval.
2. That you provide an annual interim report of your progress to the committee, and a final report once this project is completed. The first report will be due twelve months from the date you commence the research.

We wish you well in this valuable research endeavour.

Sincerely

V. Watts

**Dr Vivienne Watts**
**Chair**
Avondale College Human Research Ethics Committee

**Appendix 3.2**
Information statement to supervising prac teacher (Phase One and Three)

## INFORMATION STATEMENT TO SUPERVISING PRAC TEACHER

**RESEARCH TITLE:**
The impact of integrated movement-based activities on primary-aged students in the classroom.

**RESEARCHERS' NAMES:**
Principal Investigator: Maria Northcote
Co-investigators: Melissa Nalder - current honours student

**YOUR INVOLVEMENT IN THE PROJECT**
You are invited to assist your prac student, Melissa Nalder, in her research project.

**PURPOSE OF THE PROJECT**
The purpose of this study is to discover whether integrating movement-based activities into all subjects at school will affect the attention span of students. These movement-based activities will be varied and consist of things such as acting out the movements of a miner in the gold rush, standing up or crouching down to indicate a vote or stamping their feet to represent the thunder in the storm, from the bible story Jesus and the storm.

**PARTICIPATION CRITERIA**
All students who are a part of your class, who will be taught by Melissa Nalder, will be invited to voluntary take part in the study.

**WHAT PARTICIPATION INVOLVES**
Participation in the study involves for the children in your class:

- Taking a simple, timed numeracy quiz which will be conducted during the normal mathematics lesson for approximately 10 minutes.
- Daily rating their own perceived levels of concentration on a scale of 1 to 10.
- Completing a guided reflection diary weekly.

Your participation in the study will involve:

- Daily rating your perceived concentration levels of the class.
- Daily discussing the concentration levels of the class with your prac student, and what you perceive could have affected them.

**POSSIBLE RISKS OR INCONVENIENCES**
We are required to notify you of possible risks and inconveniences should you agree to take part in the research. There could be a child in your class that

suffers from asthma and it could be possible that the extra movement activities could irritate the condition. The activities will not be strenuous while in the classroom so this will be a low risk. However, if a problem does occur you would need to help follow the emergency protocol as outlined by the school.

**BENEFITS**

- Adds to the growing body of knowledge concerning the benefits of exercise and movement to education.
- Students will learn how to reflect on their own learning.
- If the movement-based activities do improve the attention span of the students, the study could help them to learn more effectively.

**CONFIDENTIALITY AND DISCLOSURE INFORMATION**

Data collected from this research will remain within the confidence of the researcher. Reports will not identify individual students. Data will be kept secure within password protected hard drive or in a locked storage cupboard, and stored for five years after completion of the study. After the five years all data will be destroyed.

**DISSEMINATION OF RESULTS**

The results will be published in an honours thesis which will be available in the Avondale College Library. Melissa Nalder will also make a presentation at an Avondale Conference at the end of the 2011, which will outline the research project and the results.

**FREEDOM OF CONSENT**

Your participation in this study is voluntary and there is no payment for participation. Please note that you are free to choose whether to participate in this research and you may withdraw your permission at any time without providing a reason.

Any questions about the above information can be obtained by contacting Maria Northcote at Avondale College, PO Box19, Cooranbong, NSW, 2265 Phone: 02 4980 2307 or email maria.northcote@avondale.edu.au

This research project has been approved by the Avondale College Human Research Ethics Committee (HREC). Avondale College requires that all participants are informed that if they have any complaint concerning the manner in which a research project is conducted it may be given to the researcher, or if an independent person is preferred, to the College's HREC Secretary, Avondale College, PO Box19, Cooranbong, NSW, 2265 or phone (02) 4980 2121 or fax (02) 4980 2117 or email: research.ethics@avondale.edu.au

**Appendix 3.3**
Information statement to parents of research participants (Phase One and Phase Three)

## INFORMATION STATEMENT TO PARENTS OF RESEARCH PARTICIPANTS

**RESEARCH TITLE:**
The impact of integrated movement-based activities on primary-aged students in the classroom.

**RESEARCHERS' NAMES:**
Principal Investigator: Maria Northcote
Co-investigators: Melissa Nalder - current honours student

**YOUR INVOLVEMENT IN THE PROJECT**
You are invited to allow your child to participate in a research project. This project is being conducted by an honours student and her supervisor in the Faculty of Education from Avondale College. This research will be conducted during the honour student's professional experience and all activities associated with the study will be done purely during class time. The activities will also be integrated into the curriculum, so that no extra work will be required from your child.

**PURPOSE OF THE PROJECT**
The purpose of this study is to discover whether integrating movement-based activities into all subjects at school will affect the attention span of students. These movement-based activities will be varied and consist of things such as acting out the movements of a miner in the gold rush, standing up or crouching down to indicate a vote or stamping their feet to represent the thunder in the storm, from the bible story Jesus and the storm.

**PARTICIPATION CRITERIA**
All students who will be a part of the year five classroom being taught by Melissa Nalder during her professional experience, will be invited to voluntary take part in the study.

**WHAT PARTICIPATION INVOLVES**
Participation in the study involves your child:

- Taking a simple, timed numeracy quiz which will be conducted during the normal mathematics lesson for approximately 10 minutes.
- Daily rating their own perceived levels of concentration on a scale of 1 to 10.
- Completing a guided reflection diary weekly.

**POSSIBLE RISKS OR INCONVENIENCES**
The movement-based activities will be low impact and as a result it is not anticipated that there will be any major risks or dangers for the children

involved. However, if your child suffers from asthma, it could be possible that these extra movement activities could irritate the condition. The activities will not be strenuous while in the classroom, so this will be a low risk. Please note that the activities planned will be very low impact such as walking up and down stairs, hand actions, feet actions, and other similar activities as featured in their physical education classes. The activities will be designed to improve in-class concentration rather than being cardio-vascular exercises. However, if a problem does occur the supervising teacher and honours student will follow all the necessary emergency protocol.

**BENEFITS**

- Adds to the growing body of knowledge concerning the benefits of exercise and movement to education.
- Students will learn how to reflect on their own learning.
- If the movement-based activities do improve the attention span of the students, the study could help them to learn more effectively.

**CONFIDENTIALITY AND DISCLOSURE INFORMATION**

Data collected from your child during the research will remain within the confidence of the researcher. Reports will not identify individual students. Data will be kept secure within password protected hard drive or in a locked storage cupboard, and stored for five years after completion of the study. After the five years all data will be destroyed.

**DISSEMINATION OF RESULTS**

The results will be published in an honours thesis which will be available in the Avondale College Library. Melissa Nalder will also make a presentation at an Avondale Conference at the end of the 2011, which will outline the research project and the results.

**FREEDOM OF CONSENT**

Your participation in this study is voluntary and there is no payment to the students for their participation. Please note that you are free to choose for your child to not to take part in this research and you may withdraw your permission at any time without providing a reason. Withdrawing will not disadvantage your child.

Any questions about the above information can be obtained by contacting Maria Northcote at Avondale College, PO Box19, Cooranbong, NSW, 2265 Phone: 02 4980 2307 or email maria.northcote@avondale.edu.au

This research project has been approved by the Avondale College Human Research Ethics Committee (HREC). Avondale College requires that all participants are informed that if they have any complaint concerning the manner in which a research project is conducted it may be given to the researcher, or if an independent person is preferred, to the College's HREC Secretary, Avondale College, PO Box19, Cooranbong, NSW, 2265 or phone (02) 4980 2121 or fax (02) 4980 2117 or email: research.ethics@avondale.edu.au

**Appendix 3.4**
Participant consent form
(Phase One and Three)

## PARTICIPANT CONSENT FORM

**RESEARCH TITLE:** The impact of integrated movement-based activities on primary-aged students in the classroom.

**RESEARCHERS**:
Principal Investigator: Maria Northcote
Co-investigators: Melissa Nalder - current honours student

I, _____ agree to allow my child _____to participate in the above research project and give my consent freely.

I have read and understood the information provided in the Information Statement to Research Participants.

I understand that the project will be conducted as described in the Information Statement to the Parents of Research Participants, a copy of which has been given to me to keep.

I understand I can withdraw my child from the project at any time and do not have to give any reason for withdrawing them.

The procedures required for the project and the time involved have been explained to me. I have had the opportunity to ask questions and have had them answered to my satisfaction.

I consent for my child to participate in the numeracy test, self rating of concentration, guided reflection questions and observation of my child's behaviour during the study.

Print Name:_____

Signature: _____

Date: _____

**Appendix 3.5**
Information statement for the school principal and the classroom teacher (Phase Two)

## INFORMATION STATEMENT FOR THE SCHOOL PRINCIPAL AND CLASSROOM TEACHER

**RESEARCH QUESTION:**
How do integrated movement-based activities impact on primary-aged students in the classroom?

**RESEARCHERS' NAMES:**
Principal Investigator: Maria Northcote
Co-investigators: Melissa Nalder - current honours student

**PURPOSE OF THE PROJECT**
The purpose of this study is to discover how integrating movement-based activities into all subjects at school, affects the students.

**THE TEACHER'S ROLE IN THE STUDY**
The teacher will be asked to

- Continue conducting lessons that contain movement-based activities and allow Melissa Nalder to observe them for a week.
- Organise for the students to complete a daily concentration diary and a guided self reflection journal. This should take only about 2 minutes each day for the concentration diary, approximately 10 minutes for the guided self reflection journal.
- Talk to Melissa Nalder during three casual interviews, about the movement-based activities and the impact they have on the class and individual students.

**WHAT PARTICIPATION INVOLVES FOR THE STUDENTS**

- Daily rating their own perceived levels of concentration on a scale using three faces (scale provided by Melissa Nalder).
- Completing a guided reflection diary (template provided).

**WHAT PARTICIPATION INVOLVES FOR THE HONOURS STUDENT**

- Melissa Nalder will want to observe the class for one week and their involvement in the movement-based activities.
- Melissa Nalder will also want to intermittently talk to the teacher three times about any observations that they might have made concerning the impact that the movement-based activities are having on their class, or on specific students.

**POSSIBLE RISKS OR INCONVENIENCES FOR THE STUDENTS**
The movement-based activities will be low impact and as a result it is not anticipated that there will be any major risks or dangers for the children involved.

**CONFIDENTIALITY AND DISCLOSURE INFORMATION**
Data collected during the research will remain within the confidence of the researcher. Reports will not identify the school, teacher or the students involved and the data will be kept secure and destroyed after five years.

**DISSEMINATION OF RESULTS**
The results will be published in an honours thesis which will be available in the Avondale College Library. Melissa Nalder will also make a presentation at an Avondale Conference at the end of the 2011, which will outline the research project and the results.

**Appendix 3.6**
Information statement to parents of research participants (Phase Two)

## INFORMATION STATEMENT TO PARENTS OF RESEARCH PARTICIPANTS

**RESEARCH QUESTION:**
How do integrated movement-based activities impact on primary-aged students in the classroom?

**RESEARCHERS' NAMES:**
Principal Investigator: Maria Northcote
Co-investigators: Melissa Nalder - current honours student

**YOUR INVOLVEMENT IN THE PROJECT**
You are invited to allow your child to participate in a research project. This project is being conducted by an honours student and her supervisor in the Faculty of Education from Avondale College, in association with your child's existing teacher. Melissa Nalder will be making observations of the normal class routine for one week.

**PURPOSE OF THE PROJECT**
The purpose of this study is to discover how integrating movement-based activities into the majority of subjects at school, will affect the students. Your child's teacher is already doing many of these activities as a part of the normal class routine, and the impact of this will simply be observed by the researcher.

**PARTICIPATION CRITERIA**
All students who are a part of this teacher's class will be invited to voluntary take part in the study.

**WHAT PARTICIPATION INVOLVES**
Participation in the study involves your child:

- Daily rating their own perceived levels of concentration on a scale that consists of three faces: one smiling, one neutral, and one frowning.
- Completing a simple reflection diary.

**POSSIBLE RISKS OR INCONVENIENCES**
The movement-movement based activities will be low impact and a part of the normal classroom routine and as a result it is not anticipated that there will be any major risks or dangers for the children involved.

**BENEFITS**

- Adds to the growing body of knowledge concerning the benefits of exercise and movement to education.
- Students will learn how to reflect on their own learning.

**CONFIDENTIALITY AND DISCLOSURE INFORMATION**

Data collected from your child during the research will remain within the confidence of the researcher. Reports will not identify individual students. Data will be kept secure within password protected hard drive or in a locked storage cupboard, and stored for five years after completion of the study. After the five years all data will be destroyed.

**DISSEMINATION OF RESULTS**

The results will be published in an honours thesis which will be available in the Avondale College Library. Melissa Nalder will also make a presentation at an Avondale Conference at the end of the 2011, which will outline the research project and the results.

**FREEDOM OF CONSENT**

Your child's participation in this study is voluntary and there is no payment for their participation. The results of this study will also not affect their school marks. Please note that you are free to choose for your child to not to take part in this research and you may withdraw your permission at any time without providing a reason. Withdrawing will not disadvantage your child.

Any questions about the above information can be obtained by contacting Maria Northcote at Avondale College, PO Box19, Cooranbong, NSW, 2265 Phone: 02 4980 2307 or email maria.northcote@avondale.edu.au

This research project has been approved by the Avondale College Human Research Ethics Committee (HREC). Avondale College requires that all participants are informed that if they have any complaint concerning the manner in which a research project is conducted it may be given to the researcher, or if an independent person is preferred, to the College's HREC Secretary, Avondale College, PO Box19, Cooranbong, NSW, 2265 or phone (02) 4980 2121 or fax (02) 4980 2117 or email: research.ethics@avondale.edu.au

**Appendix 3.7**
Participant consent form
(Phase Two)

## PARTICIPANT CONSENT FORM

**RESEARCH QUESTION:** The impact of integrated movement-based activities on primary-aged students in the classroom.

**RESEARCHERS**:
Principal Investigator: Maria Northcote
Co-investigators: Melissa Nalder - current honours student

I, _____ agree to allow my child _____to participate in the above research project and give my consent freely.

I have read and understood the information provided in the Information Statement to Parents of Research Participants.

I understand that the project will be conducted as described in the Information Statement to the Parents of Research Participants, a copy of which has been given to me to keep.

I understand I can withdraw my child from the project at any time and do not have to give any reason for withdrawing them.

The procedures required for the project and the time involved have been explained to me. I have had the opportunity to ask questions and have had them answered to my satisfaction.

I consent for my child to participate in completing the daily concentration self-rating scale and the simple reflection diary. I also give consent for observations to be made of my child's behaviour during the study.

Print Name:
_____

Signature: _____Date: _____

**Appendix 3.8**
Sample student self-rating scale of concentration
(Phase One and Three)

Day ____ Date: _____

How well would you rate your ability to concentrate this morning?

Please circle a number between 1 and ten, with 1 being poorly, and 10 being perfectly

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Poorly | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Perfectly |

How well would you rate your ability to concentrate during the middle of today?

Please circle a number between 1 and ten, with 1 being poorly, and 10 being perfectly

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Poorly | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Perfectly |

How well would you rate your ability to concentrate this afternoon?

Please circle a number between 1 and ten, with 1 being poorly, and 10 being perfectly

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Poorly | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Perfectly |

**Appendix 3.9**
Week 1 guided self-reflection journal (Phase One)

## Week 1 Guided Self-Reflection Journal

Name: _____

1. How well do you feel you have concentrated in class this week? Why?

_____
_____
_____
_____

2. Have you enjoyed being at school this week? Why?

_____
_____
_____
_____

3. Did you get all your class work done on time? If not, why?

_____
_____
_____
_____

4. Do you think you got more work done in class this week than normal? If so why?

_____
_____
_____
_____

**Week 2 Guided Self-Reflection Journal**

Name: _____

**Appendix 3.10**
Week 2 guided self-reflection journal
(Phase One)

1. Have you enjoyed being at school this week? Why?

2. Did you enjoy the moving activities that we did in class this week? Why or why not?

3. Do you think that having more moving activities in the classroom this week has helped you to learn better? If so how?

4. Did you get all your class work done on time? If not, why?

5. How well do you feel you have concentrated in class this week? Why?

6. Do you think that having more moving activities in the classroom this week has helped you to concentrate better in class? Why?

7. Do you think you got more work done in class this week than normal? If so why?

**Mental Maths Quiz**

Name:_____
Time:_____

**Appendix 3.11**
Timed Numeracy Test (Phase One)

1) 15 – 6 =
2) 12 + 7 =
3) 42 ÷ 6 =
4) 6 x 9 =
5) $81 ÷ 9 =
6) 15 ÷ 3 =
7) $5^2 + 10^2$ =
8) 100 – 30 =
9) 15 + 4 =
10) 20 – 9 =
11) 7 x 4 =
12) 8 x 9 =
13) 6 x 9 =
14) 27 ÷ 3 =
15) 64 ÷ 8 =
16)
87
- 55

17)
32
+ 45

18)
70
- 9

19)
9
x 3

20)
3148
+ 1902

21)
6529
+ 1764

22) 17 – 4 =
23) 3 x 6 =
24) 13 + 4 =
25) 36 ÷ 4 =
26) Triple 5 =
27) $21 ÷ 7 =
28) $2^2 + 3^2$ =
29) 4 x 125 =
30) 20 – 5 =
31) 6 x 4 =
32) 6 x 125 =
33) 3.02 + 2.43 =
34) 8 x 8 =
35) 32 ÷ 4 =
36) 1.63 + 0.25 =
37)
46
+ 25

38)
96
- 63

39)
34
+ 23

40)
10
x 7

41)
77
- 6

42) 387 + 125 =

Observation of Kindergarten, Charlton Christian College by Melissa Nalder
Teacher: Simone Randall

**Appendix 3.12** Sample Kindergarten Observations (Phase Two)

| Time | Concentration Rating 1-5 | Observations | Movement-based activity | Integrated or not | Resources |
|---|---|---|---|---|---|
| 8.50 | 4 | Class is generally settled after coming in the morning. | | | |
| 8.55 | 2 | Because the teacher took a while to get up the morning song, the kids got a little restless and talkative. Two girls at the back of the group were talking and playing with their chairs until the teacher picked up on it. | | | |
| 8.57 | 5 | Bible song and actions | Actions to bible song. | Yes | YouTube |
| 8.58 | 4 | Lots of the kids are smiling and laughing and interacting with their friends during the song. Most of the kids are singing and happily doing the actions. When the song finished they sat down all laughing and quietly chatting but calmed down very quickly. | | | |
| 9.00 | 5 | Everyone is very focused. Actions for days of the week rote learning. | Slap legs and clap to represent each day of the week. | Yes | |
| 9.03 | 4 | Star jumps for each month of the year. Well settled and behaved after activity. | Star jumps for the months of the year. | Yes | |
| 9.04 | 5 | Capital letter hand action. | Hand and arm action to represent a capital letter. | Yes | |

**Interview 1**

**Appendix 3.13** Sample Teacher Interview (Phase Two)

| | | |
|---|---|---|
| 1 | In addition to the movement-based activities you did today, what other ones do you use often in the classroom? | After recess they do Learning Connections which is a right/left brain hemisphere stimulating program because a lot of the children have more static lifestyles now. Crawling, marching, etc. Done every day. We also do movement activities to teach sight words such as stepping stones using the sight word cards. |
| 2 | Do you normally integrate the movement-based activities or keep them non-integrated? | It is but it is not really planned to be integrated. It is based more on the multiple intelligences. Also I come from a special education background and the movements that go with words helps the slower learners to remember and learn. The kids learn so much quicker now. They need to have their frontal lobe stimulated and if you do not do it for them then they will by fidgeting, arguing or going to the toilet over and over. Usually this comes out in negative behaviour. There is not much negative behaviour in my classroom because they are always moving. The movement is the base. It is just a part of the learning style. It should be in everything. The learning activities help them to focus because it stimulates the brain. Everything is integrated. They are always moving for a purpose, which is to keep them moving and to stimulate their frontal lobes so that they can continue to focus on their work. |
| 3 | What resources do you use to plan these activities? What is your inspiration for how you create these activities? | Just think of them myself usually but I am also trained in Learning Connections, which is course on movement activities to stimulate the brain. I have always done movement activities in my classroom. I am early childhood trained. It's just about knowing kids and that they have a short concentration span and that every child learns differently. The special education training also helped me to learn about the gestures. The movements seem to be super effective. It is like a sign language. It helps them to recall the sound. I use a mixture of jolly phonics and LEM programs which have the actions for the sounds, but I also make up extra actions to match the multiple phonograms which the students are learning about at this stage of the year so that they can begin to read. Because of this the kids are now reading. |
| 4 | Why do you use movement-based activities in your classroom? | To cater for all the learning needs and different styles. You can't just present one approach and expect them all to learn. |
| 5 | What benefits do movement-based activities have in the classroom? | They are retaining information better, more focused, less distracted, not much behavioural stuff. It is not easy to do it this way but it is beneficial. It needs to be very tightly structured and the behavioural systems and framework need to be in place. |

Did you finish all your **class work** today?

**Appendix 3.14**
Self-Rating Scale of Concentration
(Phase Two)

# My Concentration Diary

Name:
Day:

How well did you **think** today?

Did you have **fun** today?