

# **Using structured movement educational activities to teach numeracy and literacy concepts to preschoolers**

**Sameera Ayob**

**2016**



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

# **Using structured movement educational activities to teach numeracy and literacy concepts to preschoolers**

by

**Sameera Ayob**

Submitted in partial fulfilment of the requirements for the degree

## **MAGISTER EDUCATIONIS**

(Educational Psychology)

In the

Department of Educational Psychology

Faculty of Education

University of Pretoria

### **SUPERVISOR:**

Dr Ruth Mampane

### **CO-SUPERVISORS:**

Dr Maximus Sefotho

Dr Funke Omidire

PRETORIA

2016

## ACKNOWLEDGEMENTS

---

From my experience over these past couple of years, I have realised that the process of completing a dissertation is fuelled by family, generous colleagues, and a committed supervisor.

I would like to thank my husband Nazeer for his patience, perseverance and love, my father for being the visionary who always encouraged me to pursue knowledge and never letting me give up; my mother for always providing a mother's warmth in the home and teaching me the balance of work and family; my children Tasiyah (my strength), Zayaan (my pillar), and Zidaan (a ray of hope) for their patience, understanding and faith in me; my brother, sisters, nieces and nephews for always accommodating my needs above their own.

I would like to thank my most amazing supervisor, Dr. Ruth Mampane for her excellent guidance, patience and understanding. These qualities gave me the opportunity to guide this study to completion. I am most grateful for her continuous support and encouragement throughout the period of my research, and I sincerely believe that her guidance and attention to detail has enhanced the quality of my work. I would like to thank my mentor, Dr. Funke Omidire for taking the time to talk with me about my work, being the motivational leader, her insightful suggestions and unwavering support over the last year which have impacted positively on my final work. My co supervisor Dr. Maximus Sefotho for his time and positive reinforcement encouraging me to complete my study. Thank you to you all as without your support, this would not be possible. I am thankful for the intellectual platform provided to me by the University of Pretoria, which has allowed me to grow as both a person as well as an academic.

---oOo---

## DECLARATION OF ORIGINALITY

---

---

I, Sameera Ayob 96145758, hereby declare that all the resources consulted are included in the reference list and that this study titled:

**Using structured movement educational activities to teach numeracy  
and literacy concepts to preschoolers'**

is my original work. This dissertation was not previously submitted by me for any degree at another university.

---

S. Ayob

---

July 2016

---oOo---



## DECLARATION BY LANGUAGE EDITOR

---

---

GENEVIEVE WOOD

P.O. BOX 511 WITS 2050 | 0616387159

**EDITING CERTIFICATE**

LANGUAGE EDITING SERVICES

Date: 2016/08/08

This serves to confirm that the document entitled:

**Using structured movement educational activities to teach numeracy and literacy concepts to preschoolers**

has been language edited on behalf of its author Sameera Ayob.

Genevieve Wood  
PhD candidate  
Wits University

---oOo---



## ETHICAL CLEARANCE CERTIFICATE



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA  
Faculty of Education

RESEARCH ETHICS COMMITTEE

**CLEARANCE CERTIFICATE**

CLEARANCE NUMBER: EP 13/11/03

**DEGREE AND PROJECT**

MEd

Using structured movement educational activities to teach numeracy and literacy concepts to preschoolers

**INVESTIGATORS**

Sameera Ayob

**DEPARTMENT**

Educational Psychology

**APPROVAL TO COMMENCE STUDY**

20 March 2014

**DATE OF CLEARANCE CERTIFICATE**

04 August 2016

Please note:

For Master's application, Ethics Clearance is valid for 2 years

For PhD application, Ethics Clearance is valid for 3 years

**CHAIRPERSON OF ETHICS COMMITTEE:** Prof Liesel Ebersöhn

*pp. [Signature]*  
 Dr Matumeleng Ntho Ntho  
 Ethics Assistant  
 Bronwynne Swarts  
 Ruth Mampane  
 Maximus Sefotho  
 Funke Omidire

CC

This Ethics Clearance Certificate is issued subject to the following conditions:

1. A signed personal declaration of responsibility
2. If the research question changes significantly so as to alter the nature of the study, a new application of ethical clearance must be submitted
3. It remains the student's responsibility to ensure that all the necessary forms for informed consent are kept for future queries

Please quote the clearance number in all enquiries

## ABSTRACT

---

---

In this study, the experiences of six-year-old preschool learners in a structured movement educational assessment activity are explored. This qualitative study focused on the role of structured movement educational assessment activities in preschool learners, and assessed the way in which movement as a medium in a structured movement educational assessment activity supports learners understanding of numeracy and literacy concepts. A case study design was utilised to gather information about the experiences of the preschool learners during the activities, as well as the class teacher who facilitated the sessions. Data was collected by means of semi-structured interview, non-participant observations, a research journal, observation sheets, reflection notes, document analysis (worksheets of learners) and visual data (photographs). Thematic data analysis was applied to the gathered data, and various themes and sub-themes were identified. These were confirmed by the participants before the completion of the study.

The study adhered to the norms, values and principles of qualitative research, which entailed dealing professionally with aspects related to the different modalities of data. Further principles, namely that of informed consent, confidentiality, protection from harm, trustworthiness and anonymity, privacy and empowerment, caring and fairness were also adhered to (McMillan, & Schumacher, 2010).

This study found that the value of structured movement educational assessment activities strongly create positive outcomes associated with preschool learners in terms of their social and cognitive development. Furthermore, when preschool learners are physically involved in movement activities, they engage in tasks of listening, seeing, and doing, and practical application of concepts of numeracy and literacy. The finding further suggests that the value of assessing the preschool learners qualitatively during practical activities seemed favourable, as underlying conceptual knowledge of numeracy and literacy difficulties, as well as poor motor skill acquisition, were identified during the structured movement activities.

**KEYWORDS:**

- ❖ Literacy
- ❖ Movement
- ❖ Numeracy
- ❖ Preschool learners
- ❖ Physical activity

---oOo---



## TABLE OF CONTENT

---

---

	Page
<b>CHAPTER 1</b>	
<b>OVERVIEW OF THE RESEARCH</b>	
<b>1.1 INTRODUCTION AND RATIONALE</b> .....	1
<b>1.2 BACKGROUND OF THE STUDY</b> .....	3
<b>1.3 DEFINITION OF TERMS</b> .....	4
<b>1.4 RESEARCH QUESTIONS</b> .....	5
1.4.1 PRIMARY RESEARCH QUESTION .....	5
1.4.2 SECONDARY RESEARCH QUESTIONS .....	6
<b>1.5 SIGNIFICANCE OF THE STUDY</b> .....	6
<b>1.6 PURPOSE OF THE STUDY</b> .....	7
<b>1.7 PROBLEM STATEMENT</b> .....	7
<b>1.8 RESEARCH METHODOLOGY</b> .....	8
1.8.1 INTERPRETIVE PARADIGM .....	8
1.8.2 QUALITATIVE METHODOLOGY .....	9
1.8.3 RESEARCH DESIGN: A CASE STUDY .....	9
1.8.4 RESEARCH PARTICIPANTS .....	10
1.8.5 DATA COLLECTION .....	10
<b>1.9 DATA DOCUMENTATION</b> .....	12
<b>1.10 ETHICAL CONSIDERATIONS</b> .....	13
<b>1.11 OUTLINE OF THE CHAPTERS THAT FOLLOW</b> .....	13

---oOo---

## CHAPTER 2 LITERATURE REVIEW

<b>2.1</b>	<b>INTRODUCTION</b> .....	15
<b>2.2</b>	<b>THE DEVELOPMENTAL PROCESS OF THE PRESCHOOL LEARNER</b> .....	15
2.2.1	<b>THE PHYSICAL DEVELOPMENT OF THE PRESCHOOL LEARNER</b> .....	18
2.2.1.1	The importance of gross motor skills and fine motor skills in preschool learners .....	18
2.2.1.2	Defining the concept of movement .....	19
<b>2.3</b>	<b>CONCEPTUAL FRAMEWORK</b> .....	20
2.3.1	PREAMBLE .....	20
2.3.2	CONCEPTUAL FRAMEWORK: ASSESSMENT OF LEARNERS UNDERSTANDING OF ACADEMIC CONCEPTS THROUGH STRUCTURED MOVEMENT ASSESSMENT ACTIVITIES .....	21
2.3.3	DEVELOPMENTAL THEORIES TO SUPPORT STRUCTURED MOVEMENT EDUCATIONAL ACTIVITIES IN PRESCHOOL LEARNERS .....	23
2.3.3.1	Jean Piaget's theory of cognitive development .....	23
2.3.3.2	Erik Erikson's theory of affective development .....	25
<b>2.4</b>	<b>DEFINING THE CONCEPT MOVEMENT</b> .....	27
2.4.1	THE BENEFITS AND ROLE OF MOVEMENT FOR THE PRESCHOOL LEARNER .....	27
2.4.2	PERCEPTUAL MOTOR DEVELOPMENT AND ITS RELATION TO LEARNING .....	28
<b>2.5</b>	<b>THE NEED FOR MOVEMENT ACTIVITIES WITHIN THE SCHOOL</b> .....	29
2.5.1	POSITIVE ASPECTS THAT CAN PROMOTE STRUCTURED MOVEMENT EDUCATIONAL ASSESSMENT ACTIVITIES IN THE SCHOOL SETTING .....	31
<b>2.6</b>	<b>CONCLUSION</b> .....	34

---oOo---

## CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY

<b>3.1</b>	<b>INTRODUCTION</b>	36
<b>3.2</b>	<b>PARADIGMATIC PERSPECTIVE</b>	36
3.2.1	INTERPRETIVE PARADIGM	36
3.2.2	METHODOLOGICAL PARADIGM	38
<b>3.3</b>	<b>CASE STUDY DESIGN</b>	40
3.3.1	STRENGTHS OF THE DESIGN	41
3.3.2	WEAKNESSES OF THE DESIGN	41
<b>3.4</b>	<b>RESEARCH METHODOLOGY</b>	42
3.4.1	RESEARCH PARTICIPANTS	43
3.4.1.1	Selection of participants	43
3.4.1.2	Study participants	44
3.4.2	DATA COLLECTION TECHNIQUES	44
3.4.2.1	Non-participant observations of the participants	45
3.4.2.2	A research journal	46
3.4.2.3	Semi structured interview	47
3.4.2.4	Learners' worksheets as part of document analysis	47
3.4.2.5	Visual data	48
3.4.3	DESIGN OF THE STUDY	48
<b>3.5</b>	<b>DATA DOCUMENTATION</b>	49
3.5.1	DATA ANALYSIS AND INTERPRETATION	50
3.5.1.1	Thematic data analysis	50
<b>3.6</b>	<b>THE ROLE OF THE RESEARCHER</b>	51
<b>3.7</b>	<b>ETHICAL CONSIDERATIONS</b>	52
3.7.1	INFORMED CONSENT	52
3.7.2	AVOIDANCE OF HARM	53
3.7.3	CONFIDENTIALITY AND PRIVACY	53
3.7.4	DECEPTION OF PARTICIPANTS	54

	Page
3.7.5 VIOLATION OF PRIVACY/ANONYMITY/CONFIDENTIALITY .....	54
3.7.6 RELEASE OR PUBLICATIONS OF THE FINDINGS .....	54
3.7.7 DEBRIEFING OF THE PARTICIPANTS .....	54
<b>3.8 METHODOLOGICAL NORMS TO ENSURE QUALITY CRITERIA .....</b>	<b>55</b>
3.8.1 CREDIBILITY .....	55
3.8.2 DEPENDABILITY .....	56
3.8.3 CONFIRMABILITY .....	56
3.8.4 TRANSFERABILITY .....	57
<b>3.9 CONCLUSION .....</b>	<b>57</b>

---oOo---

## CHAPTER 4 RESEARCH RESULTS AND DISCUSSION

<b>4.1</b>	<b>INTRODUCTION</b>	58
<b>4.2</b>	<b>RESULTS FROM THE THEMATIC ANALYSIS</b>	58
4.2.1	THEME 1: THE ROLE OF MOVEMENT EXPERIENCES IN UNDERSTANDING ACADEMIC CONCEPTS	59
4.2.1.1	Subtheme 1.1: Movement activities inform understanding of academic concepts	61
4.2.1.2	Subtheme 1.2: Experiences of fundamental movement skills support learners understanding by listening, seeing and doing	65
4.2.1.3	Discussion of findings from Theme 1	70
4.2.2	THEME 2: MOVEMENT ASSESSMENT ACTIVITIES SUPPORT LEARNERS TO BUILD SOCIAL SKILLS	71
4.2.2.1	Subtheme 2.1: Success at movement activities creates teamwork group participation, and Subtheme 2.2: Movement activities build social skills	72
4.2.2.2	Discussion of findings from Theme 2	75
4.2.3	THEME 3: STIMULATING APPARATUS USED DURING MOVEMENT ACTIVITIES APPEALS TO LEARNERS' COGNITION	77
4.2.3.1	Subtheme 3.1: Appropriate space and equipment in the movement assessment activity setting	78
4.2.3.2	Discussion of findings from Theme 3	80
4.2.4	THEME 4: IDENTIFICATION OF LEARNERS EXPERIENCING DIFFICULTY	80
4.2.4.1	Subtheme 4.1: Movement experiences identify learners experiencing difficulty in movement skills, and challenges in understanding numeracy and literacy concepts	82
4.2.4.2	Subtheme 4.2: Assimilation of movement skills into classroom teaching	87
4.2.5	DISCUSSION OF FINDINGS FROM THEME 4	90
<b>4.3</b>	<b>CONCLUSION</b>	91

---oOo---

	Page
<b>CHAPTER 5</b>	
<b>CONCLUSIONS AND RECOMMENDATIONS</b>	
<b>5.1 OVERVIEW OF THE PREVIOUS CHAPTERS</b> .....	92
<b>5.2 INTRODUCTION</b> .....	92
<b>5.3 OVERVIEW OF THE FINDINGS OF THE STUDY</b> .....	93
<b>5.4 ADDRESSING THE RESEARCH QUESTIONS</b> .....	93
5.4.1 PRIMARY RESEARCH QUESTION .....	93
5.4.2 SECONDARY RESEARCH QUESTIONS .....	96
5.4.2.1 Secondary research question 1 .....	96
5.4.2.2 Secondary research question 2 .....	99
<b>5.5 OVERVIEW OF THE CENTRAL ASPECTS OF THIS STUDY</b> .....	101
<b>5.6 LIMITATIONS OF THE STUDY</b> .....	102
<b>5.7 CONTRIBUTION OF THE STUDY</b> .....	102
<b>5.8 RECOMMENDATIONS</b> .....	103
5.8.1 FURTHER RESEARCH .....	103
<b>5.9 CONCLUSION</b> .....	104
---oOo---	
<b>LIST OF REFERENCES</b> .....	105
<b>APPENDICES</b> .....	120

---oOo---

## LIST OF TABLES

	Page
Table 1.1: Timetable of the structure of a school day .....	15
Table 1.2: Visual representation of the data collection process .....	11
Table 1.3: Outline of the research collection process .....	11
Table 3.1: Strengths of a qualitative approach .....	39
Table 3.2: Challenges of a case study design .....	42
Table 3.3: Overview of the research methodology .....	42
Table 4.1: Themes and sub-themes .....	58
Table 4.2: Table of meaning .....	59
Table 4.3: Representation of subthemes, inclusion and exclusion criteria in Theme 1 .....	59
Table 4.3a: Summary of data sources used for thematic identification .....	60
Table 4.4: Representation of subthemes, inclusion and exclusion criteria in Theme 2 .....	72
Table 4.4a: Summary of data sources used for thematic identification .....	72
Table 4.5: Representation of subthemes, inclusion and exclusion criteria in Theme 3 .....	77
Table 4.5a: Summary of data sources used for thematic identification .....	77
Table 4.6: Representation of subthemes, inclusion and exclusion criteria in Theme 4 .....	81
Table 4.6a: Summary of data sources used for thematic identification .....	81

---oOo---

## LIST OF FIGURES

---

	Page
Figure 1.1: Overview of the research design and methodology.....	8
Figure 2.1: The conceptual framework of structured movement educational assessment activities.....	23
Figure 3.1: Fundamental elements of the interpretivist paradigm.....	38
Figure 3.2: Study participants.....	44
Figure 3.3: Four stage model to implement activities.....	49
Figure 4.1: Graph displaying the worksheets completed by the learners.....	87

---oOo---

## LIST OF PHOTOGRAPHS

---

	Page
<b>Photograph 4.1:</b> .....	61
Identification of understanding taking place by making use of visual and concrete blocks	
<b>Photograph 4.2:</b> .....	63
Identification of understanding of shapes, and concept of big and small reinforced	
<b>Photograph 4.3:</b> .....	64
Concept of numeracy being identified visually by the participant. The participant is engaging in the process of learning	
<b>Photograph 4.4:</b> .....	65
Instruction: throwing a bean bag into second hoop with a blue strip. Movement activity integrated numeracy and literacy concepts	
<b>Photograph 4.5:</b> .....	66
Participant counting out blocks to match the number	
<b>Photograph 4.6:</b> .....	67
<b>Photograph 4.7:</b> .....	67



<b>Photograph 4.8:</b> .....	68
<b>Photograph 4.9:</b> .....	69
Learner utilizing movement skills of hopping, and subsequently being cognisant of the numbers visually	
<b>Photograph 4.10:</b> .....	75
Photograph taken of the participants participating in a group	
<b>Photograph 4.11:</b> .....	75
Positive reinforcement identified, the children are cheering for their team player	
<b>Photograph 4.12:</b> .....	75
Teamwork and group participation. Learners' are taking turns and moving in a line. They are observing when it is not their turn and shouting in support for their team mate	
<b>Photograph 4.13:</b> .....	78
The apparatus used during the research	
<b>Photograph 4.14:</b> .....	78
Cones, blocks, number blocks, hoola hoops, and colourful shapes	
<b>Photograph 4.15:</b> .....	78
The apparatus used during the research	
<b>Photograph 4.16:</b> .....	82
Visual representation of a learner counting out blocks to match the number 6	
<b>Photograph 4.16:</b> .....	82
Visual representation of a learner counting out blocks to match the number 6	
<b>Photograph 4.17:</b> .....	86
Movement skill, numeracy concept and listening skill. Learner counted incorrectly	
<b>Photograph 4.18:</b> .....	86
Concepts of shape, colour, number identification. Learner attempting it for the second time	
<b>Photograph 4.19:</b> .....	89
Worksheet 4	
<b>Photograph 4.20:</b> .....	89
Worksheet 4	
<b>Photograph 4.21:</b> .....	90
Worksheet 4	

---ooOoo---

## CHAPTER 1 OVERVIEW OF THE RESEARCH

---

### 1.1 INTRODUCTION AND RATIONALE

The purpose of this research study is to explore the extent to which movement as a medium in a structured movement educational assessment activity can support preschool learners at six years of age in understanding numeracy and literacy concepts in a school setting. The research aims to provide a better understanding of potentially effective methods of assessment activities to support preschool learners in gaining a more concrete understanding of numeracy and literacy concepts through the medium of movement.

Developmental theories confirm that preschool years represent a time of great excitement, accomplishments and discovery, when a learner develops physically, emotionally, socially and cognitively (Erikson, 1963, 1977; Gesell, 1940; Piaget, 1952, 1971; Piaget, & Inhelder, 1969). During preschool years, a learner utilises physical movement and play in the process of growing and developing optimally. Movement is part of a learner's life from the time of conception (Gallahue, & Donnelly, 2003; Smidt, 2006). Strong foundational skills of gross motor coordination, such as running, hopping, skipping and throwing, are typically developed in an informal manner in young learners, thus providing a strong foundation base for further movement skills that may be learnt and mastered (Gallahue, Ozmun, & Goodway, 2012; Williams, Pfeiffer, Dowda, Jeter, Jones, & Pate, 2009; Robinson, & Goodway, 2009).

Stork and Sanders (2008, p.197) explain that capitalising on the body's capacity for movement is common to all young children, since children also use movement to express feelings, manipulate objects, learn about their world, delight in physical accomplishment, and enjoy movement for its own sake. Therefore, physical activity is an important component of everyday life and occurs in many forms during early childhood. Robinson and Goodway (2009), also concur that learners require specific and systematic opportunities to learn fundamental physical skills which must be taught, practised and reinforced, that will contribute to a lifetime of physical activity, and can promote growth in many areas of development in terms of the physical, cognitive and emotional aspects of six-year-old preschool learners (Gagen, & Getchell, 2006).

This chapter offers a concise overview of the subject of movement, and the way in which movement can support the understanding of numeracy and literacy concepts in preschool learners in a school setting. The importance of movement in the developmental process of a six-year-old learner's life has raised growing interest from educators across the globe, where scholars note that learning to move with skill and precision can at the same time facilitate understanding through movement (Clark, 1994; Gallahue, 1982; Bond, Cole, Fletcher, Noble, & Connell, 2011).

The benefits of movement to keep a learner physically fit and healthy is supported by Fredericks, Kokot, and Krog (2006). Blaydes-Madigan (2004) and Mahar, Murphy, Rowe, Golden, Shields and Raedeke (2006) also suggest that physical activities provide a combination of both health and learning benefits for the learner. When learners engage in physical activity it is linked to improved psychological wellbeing (Boreham, & Riddoch 2001), healthy weight status (Strong, Maline, Blimkie, Daniels, Dishman, & Gutin, 2005), and musculoskeletal health (Janz, Letuchy, Eichenberger, Gilmore, Burns, Torner, Willing, & Levy, 2010).

According to Kephart (1975), movement provides a strong foundation for developing learning skills if the normal sequence of physical movement is adhered to during the stages of a learner's life. Krog and Kruger (2011) and Pica (2004) meanwhile see movement to be a necessary tool for school readiness. Further to this, longitudinal studies have shown that movement can improve brain function and learning (Gabbard, 1998; Hanneford, 1995). Hanneford (1995, p.12) asserts that "movement activates the neural wiring throughout the body, making the whole body the instrument for learning."

Whilst the focus of this study is placed on movement and its facilitating role in the assessment of understanding numeracy and literacy concepts, the rationale for undertaking this study is centred in the motive to use the research in order to better understand the methods of structured movement educational assessment activities as a means of simultaneously supporting preschool learners gain a more concrete understanding of academic concepts through the medium of movement.

The idea of being able to integrate movement as a catalyst for both supporting and understanding academic concepts was born while completing a three month teaching internship at the school, in partial fulfilment of obtaining a postgraduate certificate in education (PGCE). Having completed my PGCE training, I was employed to teach. This in turn prompted the exploration to this topic.

## 1.2 BACKGROUND OF THE STUDY

This study involves six-year-old preschool learners attending a Muslim School situated in a suburb of Pretoria. The school is semi-private and promotes both an academic and an Islamic-based curriculum. The ethos of the school specifies an adherence to Islamic codes of conduct and attire. Young learners are urged to observe the manner of the older learners so that when they reach Grade 1, they are able to observe the structured ethos of the school, which would include dressing in acceptable Islamic attire, greeting teachers and elders with Islamic salutations, understanding the concept of male and female segregation, observing important religious dates, and strict adherence to the five times daily prayer rituals.

After observing the learners at the school and understanding the structure of their day (see Table 1.1), it seems that the role of movement is not facilitated at all into the academic periods of the school. Research has shown that the lack of physical activities sometimes result in lethargic, sedentary and fatigued symptoms in learners (Gallahue, 1976; Brown, Kennedy, Fok, Chan, & Yu, 2009), resulting in preschool learners not meeting national physical activity recommendations (Palmer, Matsuyama, & Robinson, 2016). In a classroom where preschool learners are seated when taught for the most part of the day, this can result in boredom, fatigue and lethargy, followed by loss of concentration (Hutt, Tyler, Hutt, & Christopherson, 1989; Pheloung, 1997). This can sometimes lead to disruptive behaviour, which in turn affects the learning process. Stork and Sanders (2008, p.197) have noted that “...although the positive effect of physical activity on the cognitive, social, and physical development of young children is generally acknowledged, there is little emphasis nationally on ensuring appropriate physical educational experiences within the early childhood curriculum.” The importance of movement is often overlooked, because movement is a natural part of our daily lives (Cools, Martelaer, Samaey, & Andries, 2008), and Gagen and Getchell (2006, p.227) concur that given the importance of physical play in children’s lives, it is surprising that there is not a greater attempt to inform early childhood educators on ways to teach effective movement education in a simple, systematic fashion.

**Table 1.1: Timetable of the structure of a school day**

Learners arrive at school	Outdoor play	Lunch time
8:15am	10:15am – 11:00am	11:10 – 11:40
Activities inside the classroom	<b>Unstructured outdoor play</b>	
	<ul style="list-style-type: none"> <li>Learners play on the jungle gym.</li> </ul>	Learners have a lunch break.
Art	<ul style="list-style-type: none"> <li>Play in sand castles</li> </ul>	Teachers assist learners with their lunch.
Pretend play	<ul style="list-style-type: none"> <li>Teachers monitor and observe the learners</li> </ul>	After they eat, learners can play on their own or in groups before the bell rings.
Story time	<ul style="list-style-type: none"> <li>No interaction with learners</li> </ul>	This play is also unstructured and teachers only observe the learners.
Snack time (inside classroom)		
Worksheets/charts:	<ul style="list-style-type: none"> <li>Make sure no one gets hurt</li> </ul>	Some of the learners sit on the steps or nearby benches.
<ul style="list-style-type: none"> <li>Numeracy</li> </ul>	<ul style="list-style-type: none"> <li>Curb reckless behaviour</li> </ul>	<b>Home Time 12:30pm</b>
<ul style="list-style-type: none"> <li>Literacy</li> </ul>		
<ul style="list-style-type: none"> <li>Life skills</li> </ul>		
Discussion time on the mat		
<ul style="list-style-type: none"> <li>Related to theme of the week</li> </ul>		

From this observation identified in (Table 1.1), it was also evident that preschool learners at the school find it generally difficult to clap out their names according to syllable during music periods. Other areas of concern that came from certain learners included problems with laterality, directionality, as well as low muscle tone. This was evident when some preschool learners found difficulty in grasping pencils, had poor hand-eye coordination, and struggled to cross the midline. My concern is supported by Boehm (2001, cited in Balat, 2009), that the above concepts, as well as quality, spatial, time and quantity, are concepts that a learner needs to know in order to understand the lessons and instructions the teacher presents in the classroom.

### 1.3 DEFINITION OF TERMS

This research study involves a number of key terms. The following definitions are presented.

**Movement:** Movement is necessary for all growth and change (Pheloung, 1997). Movement progresses with age, as the way in which the body manipulates itself, creates an awareness of spatial relationships, balance and coordination.

**Physical activity:** has been associated with cardiovascular health and fitness, muscular strength and endurance, and a positive association with academic achievement (Strong et al., 2005). According to Stork and Sanders (2008), physical activity in early childhood stimulates growth by supporting normal bone and muscle development. Hence, **movement** is a form of a **physical activity** which allows the body to move. This is supported by Robinson and Wadsworth (2010); and Robinson, Strodden, Barnett, Lopes, Rodrigues and D'Hondt (2015), who claim there is a relation between physical activity and movement, where both are mechanisms that show physical competence and motor ability.

**Numeracy:** According to Gallahue (1976), preschool learners deal with abstract concepts of counting, addition, subtraction, and measuring in concrete terms. This also involves shape and size discrimination, as well as number-identification abilities.

**Literacy:** According to Gallahue (1976), literacy is the development of communication skills, as well as memory and reading abilities. It includes letter recognition, letter sounds, and spelling.

**Preschool:** According to Louw (1991), the preschool period correlates with the period of early childhood, which takes place from the age of two to six years of age. He further concurs that cognitive and physical motor development occurs during this period of time.

**Learning:** Louw (1991) proposes the definition of learning as a change in an organism, which takes place as a result of experience gained by the organism, resulting in developmental process of a totally different kind.

## 1.4 RESEARCH QUESTIONS

The following research questions have been formulated to guide the study.

### 1.4.1 PRIMARY RESEARCH QUESTION

- To what extent can structured movement educational assessment activities be used to support six-year-old preschool learners, to understand numeracy and literacy concepts?

#### **1.4.2 SECONDARY RESEARCH QUESTIONS**

- What is the role of structured movement educational assessment activities in supporting the numeracy and literacy concepts of six-year-old preschool learners?
- How does movement as a medium in a structured movement educational assessment activity support six-year-old preschool learners understand numeracy and literacy concepts?

#### **1.5 SIGNIFICANCE OF THE STUDY**

The significance of this study is to guide preschool learners as part of a positive environment, by assessing the direct involvement of the class teacher, the learner and most importantly the assessment activities into a single framework for understanding numeracy and literacy concepts. There is agreement in the broader research that the preschool learners involved directly in physical activities allows them to have the most beneficial effect on early literacy (Rasberry, Lee, Robin, Laris, Russel, & Coyle, 2011) and Gagen and Getchell (2006, p.228) concur that when fun and stimulating activities are provided that challenge children at their developmental level of competence, children will participate with enthusiasm. By utilizing physical activities that integrate perceptual skill development can support learners to develop and refine their movement abilities, balance, motor coordination, and laterality (Gallahue, 1993; Tudor, 2005; Robinson, & Goodway, 2009).

Walter (2007) has stated that movement experiences enhance basic cognitive concepts in typically young learners, and Kozub (2012) states that when movement concepts are combined with locomotor, manipulative, and stability patterns, that learning experiences in the cognitive domain of learners is achieved. This is also corroborated by Erwin, Docheff and Beighle (2010), who suggest that the development of physical skills in early childhood needs to be guided as part of a scheduled activity lesson, and Gagen and Getchell (2006) concur that the process of planning these active experiences is greatly facilitated by understanding the basis of movement acquisition that defines what is appropriate for any given learner.

Garcia, Koch, Kretchmann, Falkowski, Christ and Coburger (2004) further argue that special guidance, together with early childhood developmental activities, are essential, and ensure the necessary attention required to the needs of a learner's developmental process. In line with this, I explore the role of structured movement

educational assessment activities as a means to support six-year-old preschool learners to understand concepts of numeracy and literacy.

## **1.6 PURPOSE OF THE STUDY**

The purpose of this study is to investigate the extent to which movement, as medium in a structured movement educational assessment activity, can support six-year-old preschool learners to understand numeracy and literacy concepts. I explore the concept of movement, the role of movement in six-year-old preschool learners, as well as investigate how the potential use of structured movement assessment activities can support these preschool learners' understanding of numeracy and literacy concepts in a school environment. It is proposed in this study that the above may be achieved by introducing structured movement educational assessment activities into the structure of a typical school day. These lessons adopt the approach of integrating skills of movement, and concepts of numeracy and literacy into one structured movement educational assessment activity (see Appendix H1 to H4).

## **1.7 PROBLEM STATEMENT**

Preschool learners today are less active physically. Various explanations, such as the transition to modern urban living, have resulted in learners being less active, and not playing outdoors due to lack of space, where they are instead consumed by video games and virtual reality programmes (Venetsanou, & Kambas, 2010). Scholars such as Boreham and Riddoch (2001), and Hedley, Ogden, Johnson, Carroll, Curtin and Flegal (2004) agree that preschool learners tend to spend many hours in day-care facilities, engage in increased television viewing, and have fewer siblings to play with than learners of previous generations.

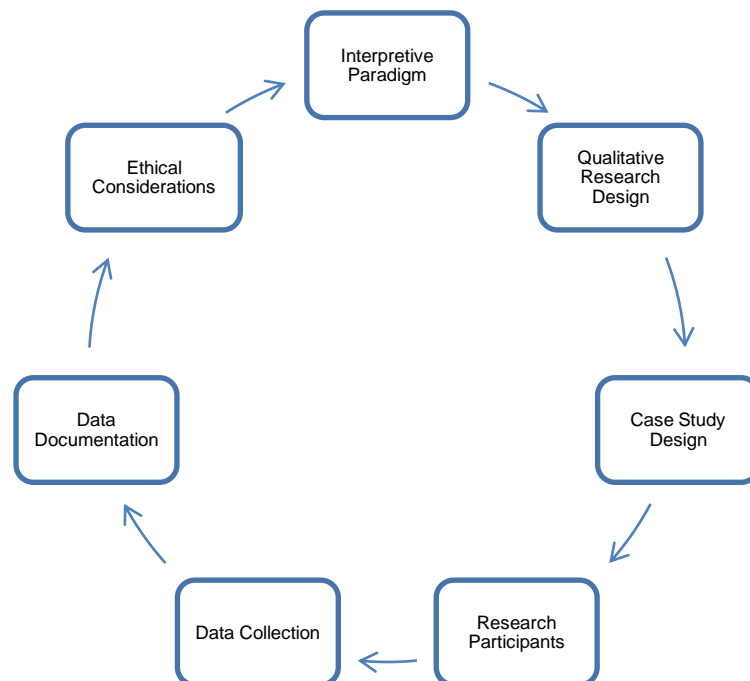
Hardman and Marshall (2009) as cited in (Van Deventer, & Van Niekerk, 2009), have discussed that there is a decline in physical activities amongst learners, not only outside the school but also within the school environment. This is also supported by Summerford (2001, p.6), who states that "physical education is often seen as a frill, and has been discontinued in many South African schools." International studies also stress on the importance to provide opportunities and equipment for learners to engage in a variety of gross and fine movement activities (Copple, & Bredekamp, 2009), and Palmer, Matsuyama and Robinson (2016), confirm that preschool centres need a daily structured movement session that includes formalized instruction for learners to participate in.



In line with the above, aspects of movement as a medium to support preschool learners understand numeracy and literacy concepts is currently not included as part of the curriculum followed at the school. From this, the more specific question could be asked: *to what extent can structured movement educational assessment activities be used to support six-year-old preschool learners to understand numeracy and literacy concepts?*

## 1.8 RESEARCH METHODOLOGY

Chapter 3 provides an in-depth description of the research methodology applied to this study. Figure 1.1 provides a concise overview of the research design and methodology.



**Figure 1.1: Overview of the research design and methodology**

### 1.8.1 INTERPRETIVE PARADIGM

An interpretive paradigm is applied to this study. This paradigm aims to understand the phenomena through which meanings are made by the participants in their natural settings, in an attempt to make sense of, or interpret, phenomena in terms of the meanings that the participants bring forth during a situation and everyday life. Smith (2004) asserts that the interpretive process leads to the construction of broad research questions resulting in expansive data collection methods. The interpretivist paradigm enables multiple ways of understanding phenomena (Yin, 2009). As a

qualitative researcher, it is important for me to find a way to discover the meanings that the research participants attribute to their worlds during the research process.

### **1.8.2 QUALITATIVE METHODOLOGY**

For this study, a qualitative research method was employed, as it is distinguished by its focus on phenomena that occur in natural settings, there is no manipulation or control of behaviour or setting (McMillan, & Schumacher, 2010). As a result, qualitative researchers recognise the multifaceted challenges, dimensions and layers that the study offers. Parker, Dalrymple and Durden (2000) also agree and describe qualitative research as that research conducted with attempts to understand meaning as well as impact in a multifaceted way. This study is intended to explore and encapsulate the subjective meanings and experiences of preschool learners engaging in structured movement educational assessment activities, rooted into a school setting.

### **1.8.3 RESEARCH DESIGN: A CASE STUDY**

A case study research design is suitable for this study as it allows the opportunity to work closely with preschool learners, supporting the process of implementation of the structured movement educational assessment activities, as well as the impact, if any, that it may have had on the broader assessment of preschool learners.

A case study design was selected purposefully to present an in-depth understanding and meaning of the participants. Creswell (2008, p.476) describes a case study “as an in-depth exploration of a bounded system (e.g., an activity, event, process, or individuals) based on extensive data collection.” A case study is a rich and holistic description of a phenomenon (Merriam, 1998, p.27). Merriam discusses the characteristics of a case study, namely (1998, pp.27-30) that:

- it consists of a bounded system (a system bound by time or place).
- it is descriptive and provides thick descriptions of the phenomenon.
- it is particularistic in that it focuses on a specific phenomenon.
- it is heuristic, as it contributes to the reader’s understanding of the phenomenon.

McMillan and Schumacher (2010) indicate that the case can be instrumental or intrinsic. For purposes of this study, I selected an instrumental case study design.<sup>1</sup>

---

<sup>1</sup> Instrumental case study will be discussed in-depth in Chapter 3.

The strengths and weaknesses of a case study design will be discussed more in-depth in Chapter 3.

#### **1.8.4 RESEARCH PARTICIPANTS**

According to Babbie, Mouton, Vorster and Prozesky (2002, p.288) purposeful sampling is the most commonly used sampling method when qualitative research is undertaken. The literature reviewed in Chapter 2 informed my decision to select a sample that was in a group (classroom setting), with their class teacher and the head of department teacher (HOD). Further to this, the developmental domains discussed in Chapter 2 informed my decision to choose Grade R learners in the six-year-old age group. The study was largely based on the subjective analysis of learners and both the teachers, and the site to be studied was a school.

For my study, I worked with one classroom of Grade R learners, comprising 20 learners and two teachers (one class teacher and one HOD), respectively. This is supported by Leedy and Ormrod (2001, p.102), who contend that “qualitative researchers tend to select a few participants who can best shed light on the phenomenon under investigation.”

#### **1.8.5 DATA COLLECTION**

The observations within a qualitative research design are documented in great detail and the methods of recording can include video recordings, field notes, interviews, documents, and drawings (Leedy, & Ormrod, 2001). These scholars further describe “qualitative researchers are often described as ‘being’ the research instrument, because the bulk of their data collection is dependent on their personal involvement (interviews, observations) in the setting” (2001, p.102). Vanderstoep and Johnson (2009) assert that employing a case study design requires utilising various data collection methods to ensure that a rich description and in-depth knowledge of the phenomenon under investigation is obtained.

The data collection process focused on me (the researcher) assuming the role of a non-participating observer during the structured movement educational assessment activities guided by the class teacher, and documenting the observations (field notes) of the participants by observing their verbal and non-verbal behaviour over a period of four consecutive days. A research journal was also utilised to capture observations and thoughts throughout the research process. Photographs were

taken to visually observe the data on the research site. Learner worksheets<sup>2</sup> served as document analysis, where the participants completed seven worksheets (on concepts demonstrated during the movement assessment activity) over a period of two days, after participating in the structured movement educational assessment activities.

The class teacher also kept reflection notes<sup>3</sup> daily, and the HOD was requested to complete observation sheets<sup>4</sup>, as the movement assessment activities took place over the period of four days. Four sessions over a period of four consecutive days were observed. A semi-structured interview with the class teacher on the last day of data collection was conducted. Table 1.2 gives a visual representation of the data collection process over the period of the four consecutive days, the sources of data utilised in this study, and the participants present during the data collection.

**Table 1.2: Visual representation of the data collection process**

No. of days	Assessment activities facilitated by	Participants on site	Sources of data
<ul style="list-style-type: none"> <li>• <b>day 1</b> - 20 participants, &amp; 2 teachers</li> <li>• <b>day 2</b> - 20 participants, &amp; 2 teachers</li> <li>• <b>day 3</b> - 20 participants, &amp; 2 teachers</li> <li>• <b>day 4</b> - 20 participants, &amp; 2 teachers</li> </ul>	<ul style="list-style-type: none"> <li>• Class teacher over the period of four days</li> <li>• Researcher set up the apparatus during the four days for the structured movement assessment activities one hour before data collection.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Class teacher</b> - 2 hours a day - TOTAL HOURS (8)</li> <li>• <b>HOD</b> - 1 hour a day TOTAL HOURS (4)</li> <li>• <b>Researcher</b> - 3 hours a day TOTAL HOURS (12)</li> <li>• <b>20 learners</b> - 1 hour a day TOTAL HOURS (4)</li> </ul>	<ul style="list-style-type: none"> <li>• Field notes</li> <li>• Observation sheets</li> <li>• Researchers journal</li> <li>• Learners' worksheets</li> <li>• Photographs</li> <li>• Semi-structured interview</li> </ul>

Table 1.3 provides a detailed overview of the research collection process during the course of the four days.

**Table 1.3: Outline of the research collection process**

DAY 1 Activities set out for 20 learners <sup>5</sup>		DAY 2 Activities set out for 20 learners <sup>6</sup>	
Class teacher	Facilitated day 1 of the assessment activity session Filled out a reflection sheet with her overall view of the assessment	Class teacher	Facilitated day 2 of the assessment activity session Filled out a reflection sheet with her overall view of the assessment

<sup>2</sup> See template of worksheets in Appendix I

<sup>3</sup> See excerpts from teacher's reflection notes in Appendix C

<sup>4</sup> See excerpts from HOD's observation sheets in Appendix F

<sup>5</sup> See Appendix H1

<sup>6</sup> See Appendix H2

	activity session		activity session
HOD	HOD was present throughout assessment activity session Wrote down her observations for day 1 on an observation sheet	HOD	HOD was present throughout assessment activity session Wrote down her observations for day 2 on an observation sheet
Researcher	Non-participant observer on site Utilised a research journal on that day	Researcher	Non-participant observer on site Utilised a research journal on that day
Photographs	Photographs taken during the course of the session	Photographs	Photographs taken during the course of the session
<b>DAY 3 Activities set out for 20 learners<sup>7</sup></b>		<b>DAY 4 Activities set out for 20 learners<sup>8</sup></b>	
Class teacher	Facilitated day 3 of the assessment activity session Filled out a reflection sheet with her overall view of the assessment activity session	Class teacher	Facilitated day 4 of the assessment activity session Filled out a reflection sheet with her overall view of the assessment activity session
HOD	HOD was present throughout assessment activity session Wrote down her observations for day 3 on an observation sheet	HOD	HOD was present throughout assessment activity session Wrote down her observations for day 4 on an observation sheet
Researcher	Non-participant observer on site Utilised a research journal on that day	Researcher	Non-participant observer on site Utilised a research journal on that day
Learners worksheets (WS) as document Analysis	Worksheets completed by the learners at the end of the session WS5/WS6/WS7 completed Total no. of WS = 60	Learners worksheets (W/S) as document Analysis	Worksheets completed by the learners at the end of the session. WS1/WS2/WS3/WS4 completed Total no. of WS = 82
Photographs	Photographs taken during the course of the session	Photographs	Photographs taken during the course of the session

## 1.9 DATA DOCUMENTATION

According to Merriam (2009), qualitative data analysis is an inductive process. Rabie (2004) reiterates and explains that the process of qualitative data analysis brings meaning to a situation, rather than to search for the truth.

Maree and Van der Westhuizen (2010), assert that inductive thematic analysis presents the researcher with multiple realities than any other data analysis strategy. An inductive thematic analysis is used to interpret the data for this study. The raw

<sup>7</sup> See Appendix H3

<sup>8</sup> See Appendix H4

data gathered from the data collection process, will be carefully prepared using transcriptions (Hayes, 2011). The transcripts will then be coded to define significant themes and sub-themes. The significant data obtained from the different modalities will be analysed with inclusion and exclusion criteria.<sup>9</sup> The data will then be categorised under themes, which will be interpreted, and the results will be documented.

## **1.10 ETHICAL CONSIDERATIONS**

Strydom (2005, p.67) has emphasised that when doing research on human subjects always adhere to a code of ethics.<sup>10</sup> As outlined by Sinkovics, Penz and Ghauri (2008), various measures to ensure that the research is carried out ethically, will be taken into consideration during this research study.<sup>11</sup> Further to this, Cohen et al. (2004, pp.49-72) also propose that the purpose and aim of the present research study will be discussed in-depth with the participants. The participants will have the choice to discontinue their participation at any time, where confidentiality will be maintained at all times regarding their identities. All of the participants will be asked to sign consent and assent forms. The research process was sought and granted with the permission of the Ethical Committee of the Faculty of Education of the University of Pretoria.

## **1.11 OUTLINE OF THE CHAPTERS THAT FOLLOW**

Chapter 2 consists of a comprehensive literature survey. It focuses specifically on the role of movement and the importance of movement in the lives of six-year-old preschool learners. Theories that have been identified as being relevant to this study include the theories of Piaget (1952, 1969, 1971), Erikson (1963, 1977), and Gallahue (1976, 1982, 1993, 1996). Other scholars in the field, who have significantly contributed to the relevance of the topic of movement and how it can support six-year-old preschool learners' understanding of numeracy and literacy concepts inform this study, by considering their point of view and contribution.

Chapter 3 focuses on the research design and methodology. It discusses the research process that ensues and the ethical domains of the study are also discussed in detail.

---

<sup>9</sup> Inclusion and Exclusion criteria is described in Chapter 3.

<sup>10</sup> Discussed in more detail in Chapter 3.

<sup>11</sup> Discussed in more detail in Chapter 3.

Chapter 4 describes the results of the thematic analysis of the data. The data collection process and findings that support the research are depicted and described in detail. This chapter also identifies the themes induced from the data analysis process.

Chapter 5 reflects on the findings from Chapter 4. These findings are compared to the literature review presented in Chapter 2. Limitations of the study are discussed.

---oOo---

## CHAPTER 2 LITERATURE REVIEW

---

### 2.1 INTRODUCTION

In this chapter, a well-grounded literature, pertaining to the role of movement, and how movement as a medium can support the understanding of academic concepts in six-year-old preschool learners. More specifically, the understanding of numeracy and literacy concepts through the effectiveness of structured movement educational assessment activities in six-year-old preschool learners in a school setting are explored. The purpose of this chapter is to provide a concise and thorough introduction of the relevant components from my conceptual framework to inform the present study, and to find a link to the research questions, which specifically focus on the way in which structured movement educational assessment activities can support preschool learners to understand the academic concepts of numeracy and literacy.

Firstly, I begin this chapter by presenting my understanding of the developmental process of the preschool learner, paying close attention to the physical, cognitive as well as social-emotional development of a six-year-old learner. I focus on Piaget's theory of cognitive development and Erikson's theory of psychosocial development, particularly where these pertain to the developmental processes for a six-year-old. Further to this, an exploration of concepts such as movement, the benefit and role of movement in the life of a preschool learner, and the way in which these affect the process of understanding in preschool learners, will be discussed in depth. The psychomotor domain of motor abilities of preschool learners is expanded upon, specifically focusing on perceptual motor development as well as the fundamental movement abilities, which include gross motor skills and fine motor skills, physical fitness and physical abilities, which will inform the present study.

### 2.2 THE DEVELOPMENTAL PROCESS OF THE PRESCHOOL LEARNER

Child development is a discipline that indicates the development of learners from birth to the end of childhood (Gallahue, & Donnelly, 2003; Smidt, 2006). This discipline aims to identify, describe and predict patterns in learners' growth, where growth includes cognitive, language, physical, moral, social and emotional development. Development is seen as holistic, as all aspects of development are



conceived as interrelated. For the purpose of this study, I focused on the physical, cognitive, as well as social development of preschool learners, and the way in which this developmental process support preschool learners' understanding of academic concepts through the medium of movement. For a learner to be actively involved in movement activities, he/she must have the physical strength to move, must be cognisant of his/her environment, and must be socially-emotionally equipped to interact in group activities.

The terms 'preschool years' and 'early childhood' are synonymous in many aspects the key factor being that they fall within the three- to six-year-old continuum. As Louw (1991) has determined, the early childhood/preschool period lasts from the ages two to six, and considerable cognitive and physical-motor development occurs during this phase of development. Umek, Kranjc, Fekonja, and Bajc, (2008) assert that learners' language, cognitive, and social development levels are connected with their academic success when they enter the school environment. For the purpose of the present study, the participants are Grade R preschool children, and I will use the term learners as this falls in line within a South African context.

Draper, Achmat, Forbes and Lambert (2012, p.137) describe early preschool years as a critical period for the development and mastery of fundamental motor skills, and Robinson and Goodway (2009) concur that planned movement skills develops gross motor skills. By employing this as a point of departure, I confirm the importance of understanding the developmental processes of preschool learners, in order to support them further in the academic sphere of their lives. There is extensive literature which maintains and confirms that during infancy and early preschool years, learners use their motor skills to explore the environment, engage in physical play, initiate social interactions, and develop basic academic skills (Clark, 1994; Robinson et al., 2015). Further to this, Goddard-Blythe (2000) explains that movement is necessary for developing attention, balance and co-ordination, which are essential for future study skills, while Walter (2007) reiterates that movement activities typically enhance basic cognitive concepts in young learners.

According to Rathus (2006, pp.262-268) and Gallahue, Ozmun and Goodway (2012, p.169), physical growth in preschool children is slower than in infancy, and the total amount of weight gained from two to five years of age is less than the amount gained during the first year following birth. Preschool learners become taller and leaner as they gain in height and lose some of their "baby fat" (Gallahue et al., 2012; Gagen, & Getchel, 2006, Louw, 1991). These scholars add that the brain develops more

quickly than any other organ in the preschool years, and that the brain has reached 90% of its adult weight by age five to six. I consider that this rapid developing period of physical growth and personality of the preschool learner can serve as a foundation where future lifelong skills can be learnt, where I argue in this study that cognition and physical development are strong contributors to preserving the understanding of numeracy and literacy concepts that can take place during this fundamentally crucial period of time.

Campbell (2006, p.34-35) explains that throughout the preschool period, children continue to demonstrate advances in cognitive and social development that are reflected in more complex reasoning and language skills. The emergence of self-awareness, self control, self-regulation, and understanding of the feelings and thoughts of others, including improved ability to balance individual needs with the needs of peers during social interaction, is greatly observed during this active developing period of the preschool years (Campbell, 2006), where it can be seen that a preschool learner is in the process of becoming more independent.

Sherborne (1990), concurs the importance of the social and emotional foundations in movement, where she identified two basic needs in all learners, namely to feel at home in their bodies, and by doing so, first to develop mastery over the body and second, to form relationships with others. This was reiterated by Stork and Sanders (2008) who concur that physical activity for preschool learners is necessary for their overall development, as this promotes the mastery of skills and attitudes that may lead to more healthy behaviours later in life, and that physical activities also facilitates cognitive and social development.

It is important to understand how movement and the development processes in six-year-old preschool learners are interrelated. This in turn can inform ways to expand on age appropriate assessment activities by means of which to support the assessment of an understanding of numeracy and literacy concepts as demonstrated through the medium of structured movement. This is supported by Gallahue (1976), in his early work, where the author firmly states that the basis for any sound educational activity lies in a thorough understanding of human development.

## **2.2.1 THE PHYSICAL DEVELOPMENT OF THE PRESCHOOL LEARNER**

The physical-motor development of the learner occurs during childhood, During this time, a learner's motor control increases considerably and the growth of the body and its internal structure goes hand-in-hand with the learner's gradual improvement in control over the body and body movements (Louw, 1991). Gallahue and Donnelly (2003); Pica (2004) and Gagen and Getchell (2006) stress that continuous practice and instruction of skills are required if one wants to observe results in the learner's performance level and movement repertoire. Pica (2004) further states that once a learner is able to creep and walk, gross motor skills ought to be taught, and Robinson and Goodway (2009) emphasize that a planned movement activity for learners develops gross motor skills.

Lemos, Avigo and Barela (2012) assert that mastering fundamental skills at an appropriate age with the use of regular physical activities at school would prevent learners from being delayed in their motor development, and Peter and Walter (2010, p.39) agree that without these skills, many children will not absorb a love of activity, nor will they become capable enough in movement to encourage them to be lifelong movers practicing healthy lifestyle choices. In light of the above, this research took place over a period of four consecutive days, and included assessment activities which integrated movement skills and academic concepts of numeracy and literacy for Grade R learners.

### **2.2.1.1 The importance of gross motor skills and fine motor skills in preschool learners**

Gross motor skills, as described by Wang (2004), are skills such as static and dynamic balance, strength and agility, and general body control. As Louw (1991) elaborates, these skills usually develop within the context of a learner moving, such as gross motor would include: running, hopping, jumping and fine motor would include painting, cutting with scissors, and their development is also dependant on their physical growth. The following authors, Gallahue et al. (2012, p.16) and Gallahue and Donnelly (2003, p.68), explain that gross motor skills are the movement of the large muscles of the body, whereas fine motor skills involve limited movements of parts of the body in the performance of precise movements.

Eliason and Jenkins (1986) believed that early childhood educators needed to breakdown motor skills into two major categories, that is, gross motor skills (large muscles) and fine motor skills (small muscle). Gross motor skills and fine motor

skills fall within the component of fundamental movement skills, and are important concepts for the development of the learner. A learner needs to master these skills through the progression of development. Gallahue et al. (2012, p.169) also concur that the preschool years represent an ideal time to develop and refine a wide variety of movement tasks ranging from the fundamental movements of early preschool years to more specialised skills of middle childhood.

A research study by Giagazoglou, Karagianni, Sdiropoulou and Salonikidis (2008) highlighted the influence of preschool-type setting (public vs. private) on learners' gross motor development. Results revealed that learners who attended the private preschool type-setting, with plenty of open space for play, gymnasia, courts and playgrounds and including daily exercise physical activity programmes, displayed a higher gross motor score than learners who participated in public preschool centres that had limited spaces for sports and free play, and which did not include any physical education lessons into their schedule.

### **2.2.1.2 Defining the concept of movement**

The definition, 'movement is life,' by Gallahue et al. (2012, p.3) is sufficient to understanding this concept. Movement can be defined as an essential component of a learner's development. It facilitates a healthier connection with the body, senses, cognitive skills, improving body awareness and body image (Elliott, 1998, p.253). Gallahue et al. (2012) agree by stating that our very existence depends on a beating heart, breathing in and breathing out from of our lungs, as well as a host of automatic movement processes that take place in our body. Researchers also concur that physical activity has been associated with cardiovascular health and fitness, muscular strength and endurance, and a positive association with academic achievement (Strong et al., 2005). Robinson and Goodway (2009) concur that physical activity contributes to the health of young learners and a review from Robinson et al. (2015) supports a positive relationship between fundamental movement skills (FMS) and health related outcomes such as fitness, physical activity engagement, and perceived competence.

Pangrazi and Dauer (1981) define physical education as learning to move, moving to learn, and learning about movement. Shim, Norman and Kim (2013) meanwhile assert that the main purpose of physical education is to improve physical development, which benefits cognitive, academic, social as well as emotional aspects within a learner's life. For this study, I use the term movement

interchangably with physical activity, and physical education. This usage is supported by (Robinson, 2010), who claims there is a relation between physical activity and movement, as both are mechanisms which show physical competence and motor ability. For effective physical competence, movement skills need to be introduced to preschool learners, so that they can manage their body in space.

Strong et al. (2005) claim that the physical activities of learners and adolescents vary with age, type of exercise, and setting. These scholars further stress that physical activity and movement ability begins in infancy, with pushing up, turning, crawling, and eventually walking, and it progresses to more complex activities as neuromuscular control develops. Gallahue et al. (2012) agree, and claim that learners, adolescents, and adults are involved in a lifelong process of learning how to move with control and competence. Strong et al. (2005) and Gallahue et al. (2012) also agree that basic movement patterns develop during preschool ages, and are the foundation for a wide range of physical activities at later ages. With growth, maturation, and experience, basic movements are integrated and coordinated into more specialised and complex movement skills that characterise the free play, games, sports, and other activities of school-age youth.

It is safe to assume that during the preschool years, a learner is explorative, adventurous, and has the ability to move. Movement skills such as simple motions of jumping, hopping, throwing, catching, running, etc. are part and parcel of the preschool learner's physical development. Gallahue et al. (2012, p.186) also stress that learners ought to focus on developing basic motor competence and efficient body mechanics in a wide variety of movement skills and situations. One can deduce that it is useful to take on an opportunity by acknowledging the physical competence of the preschool learner and integrating other areas of development, specifically focusing on cognitive and the social development of the preschool learner. The literature supports the fact that during this explorative and developmentally appropriate stage of life, structured movement educational assessment activities can serve as a medium to promote academic understanding of numeracy and literacy concepts in the fundamentally important preschool years.

## **2.3 CONCEPTUAL FRAMEWORK**

### **2.3.1 PREAMBLE**

The value of the importance of movement in preschool learners cannot be overemphasised. Movement is an essential component of a learner's development. I

am focusing in particular on the physical, the cognitive, and the social-emotional developmental processes of preschool learners. These domains of learner development, which are explained by Jean Piaget and Erik Erikson, are discussed in detail in sections (2.3.3.1) and (2.3.3.2) and have supported me in developing age-appropriate, structured movement educational assessment activities by means of which to support six-year-old preschool learners to understand numeracy and literacy concepts. The above theories confirm that movement is a crucial developmental process, where Gallahue (1976) confirms that it permeates all facets of a learner's development, that is the psychomotor, cognitive as well as affective domains of behaviour.

### **2.3.2 CONCEPTUAL FRAMEWORK: ASSESSMENT OF LEARNERS UNDERSTANDING OF ACADEMIC CONCEPTS THROUGH STRUCTURED MOVEMENT ASSESSMENT ACTIVITIES**

I was guided by the seminal work of Gallahue and his theoretical framework of learning to move and learning through movement when constructing the conceptual framework in Figure 2.1. Gallahue's (1976) theoretical framework underpins three important aspects of movement development: first, the interrelated nature of motor development as affecting a learner's cognitive, affective behaviour as well as psychomotor development (fundamental movement abilities of locomotion, manipulation and stability); second, the learner's physical abilities of physical and motor fitness; and last, the cognitive development of the learners' perceptual and academic abilities, while the learner's self-concept is addressed within the affective development stages.

Against this backdrop of knowledge, I integrated the above components to create a conceptual framework pertaining to the acquisition of movement activities to support the understanding of academic concepts for preschool learners, while paying close attention to the way in which movement can have a positive influence on learners' domains of physical, cognitive, social, and emotional development.

My conceptual framework is the assessment of learners' understanding of academic concepts through structured movement assessment activities, where numeracy and literacy concepts are included into the movement activities. I focus on the movement abilities, which include skills of locomotion, manipulation, and stability, identified as by Gallahue (1976) and Gallahue and Donnelly (2003), as part of structured movement educational assessment activities, to support preschool learners

understanding of numeracy and literacy concepts. I incorporated locomotor skills, which the broader literature defines as age-appropriate activities for six-year-old preschool learners. These included activities such as: running, jumping, and hopping. For object control skills, I adhered to the manipulation skills of: throwing, rolling, kicking, and catching. Stability included observations pertaining to the judgement as to whether balance, coordination as well as attention were met by the preschool learner, whilst engaging in the physical activities.

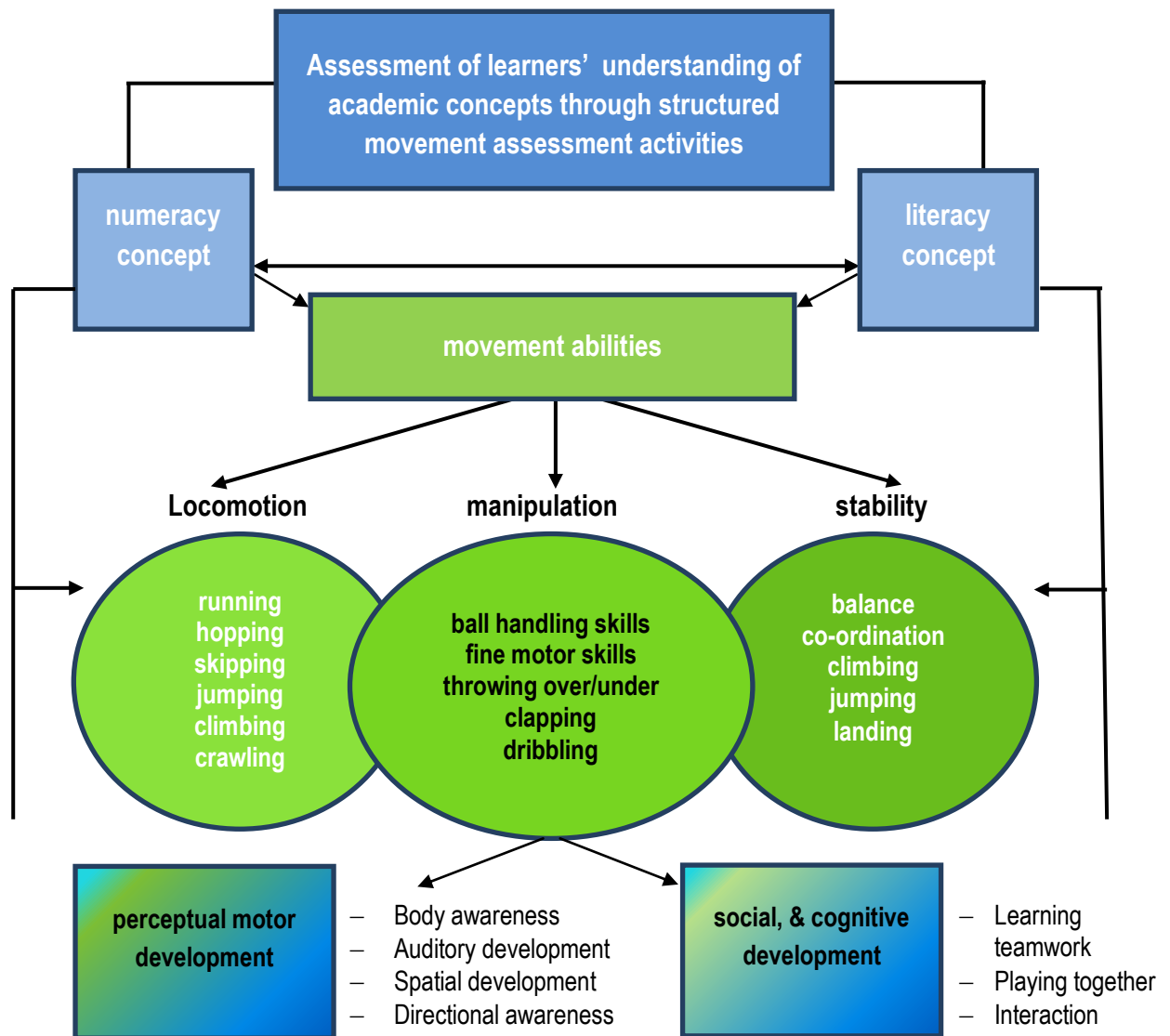
Gallahue (1982) confirms that affective development involves dealing with learners' increased ability to act, interact, and react effectively with other people, as well as with themselves. The social interaction gained whilst engaging in activities with their peers can have a positive impact in the life of a preschool learner, and the movement activities can also support the interaction, which in turn serves as a catalyst to promote positive interaction at school with peers.

Learners become participants of team effort, playing together, as well as interacting with their peers, where all these components support the social-emotional development of preschool learners, where learners demonstrate by doing, as well as by engaging in team effort. Hence, the social environment where movement activities take place under the umbrella term of a world of play becomes a strong source of support for the understanding of numeracy and literacy concepts. I argue here that this platform is crucial to integrating the social development of the preschool learner into a structured movement educational activity, which promotes integrated understanding across the physical, cognitive, emotional as well as social domains of development in a preschool learner.

Perceptual-motor learning, as defined also by Gallahue and Donnelly (2003), is the establishment and refinement of sensory sensitivity to one's world through movement, thus enhancing a learner's knowledge of their spatial world through movement activities that play a vital role to their body, space and directional awareness. During the activities, the learners subsequently engaged in body and directional awareness, as well as auditory, visual and spatial development.

In summary, Figure 2.1 is an illustration of learners being assessed for numeracy and literacy concepts, understood by the learners through the medium of structured movement educational assessment activities. These activities include movement abilities of locomotion, manipulation, and stability, which in turn also support the perceptual motor development of the learner who participates in these activities.

During this process, the learners are also involved in teamwork and group activities which inform the social development of the learner.



**Figure 2.1: The conceptual framework of structured movement educational assessment activities**

### 2.3.3 DEVELOPMENTAL THEORIES TO SUPPORT STRUCTURED MOVEMENT EDUCATIONAL ACTIVITIES IN PRESCHOOL LEARNERS

#### 2.3.3.1 Jean Piaget's theory of cognitive development

Constructivist theorist Piaget is a pioneer, who contributed to our understanding of how learners learn, grow and develop intellectually (Piaget, 1952). He theorised that learners learn not only through experience, but also through social interaction and transmission (Piaget, & Inhelder, 1969). Piaget believed that the opportunities to be physically and mentally involved in learning, is necessary for the mental



development of learners in the early years (Morrison, 2004). Piaget also emphasised the importance of movement as an information gathering device for learners to learn about themselves and their world (Gallahue, 1982). For this reason, cognitive psychology focuses on studies of mental processes, which include the way in which people think, perceive, remember, and learn (Blake, & Pope, 2008). Its core focus is on how people acquire, process, and store information.

Piaget divides human cognitive development into four periods, namely the sensori-motor period (birth to two years), the pre-operational period (two to about seven years), the period of concrete operations (seven to eleven years) and the formal operational period (from about eleven years onwards) (Piaget, 1941, 1952; Piaget, & Inhelder, 1969). For the purpose of this study, I focus on the preoperational period, which concentrated on the age of the six-year-old learner, which is appropriate for the present study. According to Piaget's developmental theory, motor skills contribute to young learners' active exploration of the environment, and it is through such actions that young learners construct their knowledge of the world (Piaget, 1952). During the preoperational period, the learner's cognitive development is focused on the development of the ability to represent things mentally and symbolically (Louw, 1991). This is further supported by Morrison (2004), who describes that during the preoperational stage, learners' knowledge is based mainly on what they are able to see.

Gallahue et al. (2012, pp.173-174) further concur that during this phase, cognitive functions eventually result in logical thinking and concept formation. These scholars further assert that play serves as a vital means by which higher cognitive structures are gradually developed. It is valuable for me to understand cognitive psychology, because it allows me the opportunity to create diverse assessment activities, which facilitate the exploration of structured movement educational assessment activities. This knowledge also supports me to become more cognisant of how preschool learners process, learn, and remember information, which guides me to plan effective assessment activities for preschool learners through the medium of movement.

A recent study cited by Mensah and Somuah (2014) asserts that Piaget's theory has subsequently had a profound impact in the education sphere, where many educational programmes are built upon the belief that a learner ought to be taught at the level for which he/she is developmentally prepared (Santrock, 2008). This correlates with my view that preschool learners must be physically able to use age-

appropriate movement skills, which in turn can support the assessment of numeracy and literacy concepts.

Mensah and Somuah (2014) affirm that applying Piaget's theory in the classroom can have many benefits for both teacher and learners, where teachers develop a better understanding of their learners' thinking. They can also align their teaching strategies with their learners' cognitive level. In line with this view, I feel it can be appropriate to align structured movement educational assessment activities for preschool learners, focusing on their cognitive and expected age-appropriate movement skills. This view is also supported by Mensah and Somuah (2014), who, in their recent study, compared Piaget's and Vygotsky's developmental theories, and examined how their educational extensions might be applied in promoting students' learning in Basic Education Programme in Ghana. These scholars felt that educators ought to have an understanding of Piaget's and Vygotsky's theories, and that learners ought to be provided with more opportunities to play and learn with peers.

This observation supports my study, where it can be reasoned that preschool learners should be provided with opportunities where they can participate in movement activities, and be subsequently supported in a group. Mensah and Somuah (2014) stress that the role of the teacher is not to distribute knowledge, but rather, to act as a facilitator, who provides an appropriate learning environment, and encourages the learner to formulate ideas, discover concepts, and think independently.

Nair, Yusof, and Arumugam (2014) maintain that learners' interest in understanding language can be enhanced if teachers employ methods involving elements of joy and fun. These findings support the initiative underway here, as they confirm that adapting change by including physical assessment activities as a mode to promote an understanding can be beneficial to the learner cognitively, and can create a strong sense of self-confidence when a concept is understood. This in turn can promote social and emotional development, since there is at once engagement in group activity.

### **2.3.3.2 Erik Erikson's theory of affective development**

Erikson (1963, 1977) based his theory of psychosocial development on the principle that cognitive and social development occur simultaneously. He asserted in his work that a learner develops his/her personality and social skills within the context of institutions such as the families, schools, and child care programmes. For the

purposes of this study, I focused on the preschool learner in relation to the academic sphere, which was in this case the school setting.

Erikson divides the life span into eight stages (Erikson, 1963). For intent of the present study, I focused on the third stage, more commonly known as the stage of initiative versus guilt (synthesis: purpose). This stage lasts from approximately ages three to six, and is described as an age where learners' greater freedom of movement and autonomy allows them to act more independently than before, where they start to explore the world with a newfound sense of purpose (Louw, 1991). Gallahue et al. (2012, p.36) further concur, and describe this stage, when initiative is established during the early childhood years, and when children are challenged to engage in more purposeful and responsible socialised behaviours.

Maier (1969) and Gallahue et al. (2012) elaborate, and describe the social environment of the learner as challenging, where there is a need for learners in this stage to master specific tasks. Gallahue et al. (2012) emphasise that this stage serves as a platform where fundamental movement skills are already acquired and are being mastered, which in turn influences the learner's success in games as well as activities, and Rogoff (2003) describes this as a social milieu where learners engage in a variety of activities, watching each other participate, in the course of incidental learning, acquire information about how to do the activity, base their performance in comparison to their peers, and lastly experience the activity as meaningful.

Johnson and Johnson's (1999) theory of cooperation, which encourages working together to accomplish shared goals. Johnson and Johnson's cooperative sub-skills of: (1) helping (2) turn taking (3) sharing (4) division of labor (5) negotiation (6) ability to coordinate effort (7) exchange complimentary pieces of information, and (8) perspective taking, ought to provide preschool learners with opportunities where they can participate in movement activities, and be subsequently supported in a group.

A recent study by Gehris, Gooze and Whitaker (2014) explores preschool learners movement experiences. One of the themes that emanated from this research and which supports the present study is these authors' assertion that "success at movement tasks builds children's self-confidence" (2014, p.4). This study confirmed that when learners were successful in achieving new motor skills, they developed self-confidence, and teachers' reported that the self-confidence learners developed from being successful at movement skills would spill over into all the other academic

areas of the preschool curriculum. Gmitrova and Gmitrov (2004) are also of the view that child-directed play is an important factor enhancing social and cognitive development in learners, and when included into the preschool curriculum, appears to be necessary for learners to develop academic readiness.

A study by Nair, Yusof and Arumugam (2014), which focused on the implementation of the play method to learn a particular language, showed an improvement in the mastery of vocabulary among preschool learners, when compared to the conventional method, because the play method enhanced the learners' interest in understanding, where it included a more enjoyable and fun approach. The technique of play reinforces the idea that social interaction can promote understanding, when learning becomes a social activity rather than an individualised one.

## **2.4 DEFINING THE CONCEPT MOVEMENT**

### **2.4.1 THE BENEFIT AND ROLE OF MOVEMENT FOR THE PRESCHOOL LEARNER**

Extensive research suggests that movement provides a myriad of benefits for learners that occur over their life span. It benefits their physiological and psychological well-being (Cragg, & Cameron, 2006; Stork, & Sanders, 2008), as well as promotes health and educational benefits (Dotterwich, Greene, & Blosser, 2012; Pienaar, 2009). The benefits of movement to keep a learner physically fit and healthy is also reinforced by Fredericks, Kokot and Krog (2006). Blaydes-Madigan (2004) and Mahar, Murphy, Rowe, Golden, Shields and Raedeke (2006) also suggest that physical activity has a combination of health benefits, as well as learning benefits for the learner. Daily activity also promotes a good cardiovascular system, stimulates the muscular-skeletal and metabolic systems, and creates a fitter body (Pienaar, 2009).

Research suggests that movement experiences have been shown to enhance basic cognitive concepts in developing young learners (Walter, 2007). Kozub (2012) meanwhile argues that promoting physical education as a subject can also support understanding in core academic subjects. Movement is also a strong prerequisite for learning readiness, it provides the basis to help the brain integrate in preparation for academic work (Pheloung, 1997).

The relation between movement and successful learning has been at the root of earlier theorists, such as Delacato (1959, 1974), Cratty (1972, 1973), Kephart (1975) and Ayres (1979). These scholars' works assumed that movement reflects neural

organisation and provides the stimulation to neurological systems that are necessary for optimal development and functioning. Pang and Fong (2009), expand to say that learners acquire new fundamental motor skills (FMS) successfully during the preschool years (Olrich, 2002, cited in Pang & Fong, 2009), and also assert that learners neurological pathways develop rapidly during the preschool years and are therefore receptive to the development of fundamental movement patterns and basic skills.

Movement can be seen as an integral part in the mental processing of a learner. Hannaford (1995) declares that every movement is a sensory-motor event, linked to an understanding of the physical world, and it is from this point of departure that all learning derives. Taras (as cited in Pica, 2004), explicitly states that learners think better when their daily routine includes physical activity. A recent study by Karabulut (2013), who also cites Hannaford (1995), claims that the mind/body connection is central to these astounding new insights into how the brain learns. Karabulut (2013, p.3) further suggests that the importance of well-balanced sensory development and the role of the cerebellum is responsible for all movement, and well-balanced communication between the two brain halves, are whole body experiences. In order for the brain to cope with the demands of formal education, it needs to be exposed to as well as to learn to deal with a rich variety of sensory and motor experiences, at home, as well as in a school environment. These movement experiences in turn benefit the learner, where movement serves as a catalyst to facilitate and support the academic sphere of the preschool learner.

#### **2.4.2 PERCEPTUAL MOTOR DEVELOPMENT AND ITS RELATION TO LEARNING**

Perceptual development is the developing ability to interpret information received via the senses (Louw, 1991). Gallahue (1976) stresses the importance of perceptual-motor development, and states that from the moment of birth, the infant begins the process of learning how to interact with his environment. Perceptual-motor learning, as defined also by Gallahue and Donnelly (2003) is the establishment and refinement of sensory sensitivity to one's world through movement, thus enhancing learners' knowledge of their spatial world through movement activities that play a vital role for their own body, in the form of spatial and directional awareness. They further elaborate that the interaction is a perceptual, as well as a motor process.

Karabulut (2013) concurs that the brain processes information through the five senses: hearing, sight, touch, smell and taste, and further explains that physical experience is influenced by the way in which a learner orientates his/her body and how he/she can balance the body. Krog and Kruger (2011, p. 72) suggest that a movement activity include the above systems: vestibular (balance system viz. the main instructor of the sensory system), proprioceptive (body in space), tactile (touch), visual (seeing) and auditory (hearing) systems. These scholars further claim that each system has a sensory organ through which information is gained and primary actions are initiated, they depend on each other for interpretation of information, and for movement. For optimal learning and understanding to take place in preschool learners, it is important to explore all the senses, as well as understand the sensory processing requirements (Karabulut, 2013).

Elena, Georgeta, Cecila and Lupu (2014) affirm the importance of sensory motor integration in a recent study, where they concluded that the inclusion of dynamic physical activities in the educational programme induces positive effects in the development of motor skills of elementary learners. In their study, they concur with Gallahue (1993), who asserts that by using activities of perceptual skill development, learners can develop and refine movement abilities and perceptual-motor abilities.

Through extensive research, the role of movement and how movement specifically can facilitate preschool learners' development, has also been established by the works of earlier research studies by De Witt and Booyesen (1995); and Pheloung (1997), who emphasise the importance of constraints such as laterality, directionality and crossing the midline. The spatial orientation of the learner – another constraint – was also elaborated in the works of Flinchum (1975); Corso (1993); Bluestone (2004); and Gallahue et al. (2012). Gallahue et al. (2012), state that the spatial and temporal worlds play an important role in perceptual motor training activities. The above constraints have been integrated into the structured movement educational assessment activities, with a view to providing greater insight into the rationale behind the movement activities and the understanding of numeracy and literacy concepts for six-year-old preschool learners.

## 2.5 THE NEED FOR MOVEMENT ACTIVITIES WITHIN THE SCHOOL

The importance of movement education is often overlooked, because movement is a natural part of our daily lives (Cools et al., 2008). The implication of movement in the developmental process of a learner's life has also led to growing realisations from educators across the globe in this respect, where many scholars now feel that learning to move with skill and precision can at once facilitate learning through movement (Gallahue, 1982; Clark, 1994; Bond et al., 2011), while Park, Solomon and Lee (2007); Dotterwich et al. (2012), and Kirk, Vizcarra and Looney (2014) have stressed the health and educational benefits associated with physical activity in classrooms, and support the view that schools need to promote physical activities.

Clark (2007, cited in Lemos, Avigo, & Barcela, 2012, p.17) states that "the acquisition of gross motor skill is critical, but despite its importance, unfortunately, gross motor development has been overlooked by many who work with early education." Pate, Dowda, Brown, Mitchell and Addy (2013) are also of opinion that public health initiatives ought to promote and facilitate physical activity in preschool settings, because most learners are already attending a preschool. They also assert that more time is allocated to enhancing learners' pre-academic and school readiness skills, which limits the amount of time allocated to promoting and support learners' physical activity.

However, Bond et al. (2011), in recent years, argue that the area of motor skills has tended not to be a high priority for schools, and has since become an area which they have been actively encouraged to target. The studies pertaining to motor skills interventions to date have also not addressed the wider issue of implementing physical activities in school settings. There is evidence to suggest that there is a need for school-based interventions for learners with motor skill difficulties (Bond et al., 2011). Pate et al. (2013) also confirm that public health initiatives aim to promote and facilitate physical activity in learner care and preschool settings, with a focus on enhancing learners' pre-academic and school readiness skills, but also stressing and asserting that a limited amount of time is allocated for physical activities in schools.

Dotterweich, Greene and Blosser (2012) confirm this view, by stating that physical activity provides a myriad of academic benefits, including an improvement in concentration and attention. In young learners, play and physical activity are closely connected. Free play is vital for the learner's overall development, serving multiple important functions in their emotional, social, motor and cognitive development

(Kreichauf, Wildgruber, Krombholz, Gibson Vögele, Nixon, Douthwaite, Moore, Manios, & Summerbell, 2012). These scholars also feel that physical activity can and should be integrated into the daily routines and the existing curriculum of preschools, and should not be seen as something competing with other educational goals.

The benefits of including movement into the school setting is reinforced throughout literature supporting my view, in that, movement filters positively through all aspects of the developing learner. It promotes well-being and good health, reduces fatigue, activates the cognitive domain for active understanding to take place, and promotes positive social integration. Movement activities provide constructive, beneficial, and practical elements into the lives of preschool learners, with a view to uplifting them physically, cognitively, emotionally and socially.

### **2.5.1 POSITIVE ASPECTS THAT CAN PROMOTE STRUCTURED MOVEMENT EDUCATIONAL ASSESSMENT ACTIVITIES IN THE SCHOOL SETTING**

Integrating movement to demonstrate the understanding of numeracy and literacy concepts in preschool learners can be very beneficial for the learner, as Black (1995, p. 33) reports that “a good physical education activity can boost academic achievement”. He further elaborates that learners learn more in a physical education activity than they do sitting still most of the day in the classroom. Gallahue and Donnelly (2003) also accept that when cognitive concepts are demonstrated through the medium of movement, active participation reinforces fun. They further state that when learners engage in activities that involve teaching an academic concept, their attention is not as easily diverted, as when they are learning in a less active classroom setting.

Integrated learning is also supported by Humpries, Bidner and Edwards (2011), who concur that the learner’s learning experience exhibits responsible personal and social behaviour that respects self and others in physical activity settings. They further state that physical activities are beneficial as they value aspects of health, enjoyment, challenge, self-expression, and/or social interaction.

Gabbard (1998) suggests that early brain and motor development can be used as a window of opportunity to promote strong movement skills as prime learning and understanding takes place up until nine years of age. Humphrey and Wakeford (2008), Balat (2009) and Pellet and Pellet (2010) agree that everyday activities and basic concepts and words which are introductory to literacy can be introduced through movement activities.



Fredericks et al. (2006) and Kozub (2012) further stressed the importance of movement as a core ingredient to academic understanding, and feel that if physical and academic educators share the curriculum, they will increase learners' understanding in the cognitive domain, and at the same time, include the important movement skills that will holistically promote the development of the whole learner. Pienaar (2009) is also of the view that motor abilities are key ingredients for school readiness, and Pica (2004) concurs that a developmentally appropriate movement curriculum can benefit learners in the refinement of movement skills, and at the same time, can expand their movement vocabularies.

Gallahue, Ozmun and Goodway (2012) support movement as part of a school activity, by highlighting that such activities should, first of all, be prescriptive, and based on the learner's developmental level, they should include opportunities for gross motor play, as well as an extensive variety of activities that require object handling and hand-eye coordination. These scholars further suggest that the activities ought to be planned to also enhance the perceptual motor functioning of learners. The activities should also include ample opportunities to elevate positive reinforcement, which in turn will construct a healthy sense of self, and will also reduce the fear of failure. Promoting physical activities in a preschool focused on enhancing learners' pre-academic and school readiness skills are initiatives that Pate et al. (2013) argue, which support learners' physical activity. This is reiterated by Orlowski, Lorson, Lyon and Minoughan (2013), who state that opportunities for physical activity are needed throughout the school day.

An article by Stork and Sanders (2008) highlights the positive effect of physical activity on the cognitive, social, and physical development of young learners, who, through extensive research, examines the incidence and quality of physical activity instruction during early childhood. They suggest that young learners learn more via developmentally appropriate instruction than through random physical activity. They also draw attention to the way in which learners use movement, to express feelings, manipulate objects, and learn about their world, and in addition, they delight in physical accomplishment and enjoy movement generally. Hence, these scholars further maintain that physical activity is an important component of everyday life, and occurs in many forms during the early childhood years.

Pienaar (2009, p.53) supports structured movement development activities, and states that they are critical contributors to the development of fundamental movement patterns, perceptual motor skills, positive cognitive outcomes, health

benefits, and self confidence, where she further notes that support for good movement development can serve as a strong foundation upon which the total development of learners can come to rest.

Kreichauf et al. (2012) in addition conducted a study focusing on accompanying physical activity lessons with language. They found that this is not, as might be assumed, more time-consuming, but is in fact just as effective. This research found that three of the studies surveyed by these authors confirmed reaching two curricular goals with one activity to be possible. This positive view appears to confirm that both the role of movement and the integration of academic concepts positively impacts on the understanding of learners specifically when they are incorporated into a structured movement educational assessment activity.

Pellet and Pellet (2010, p.50), in a research article entitled 'Building Physical Education Knowledge and Understanding Through Vocabulary Activities', alleges that implementing vocabulary words in physical education on a regular basis can make a significant difference in building learners background knowledge and comprehension. These scholars further maintain that this type of integration can enhance reading, improve understanding of movement concepts and develop movement quality.

Little Champs is a motor development programme for preschool learners that began in 1995 for the economically disadvantaged communities in South Africa. It was designed by sports coaches and human movement specialists. This programme exposes learners to play, and to have the opportunity to develop and master motor skills. These skills then form the foundation for the development of skills that can be used in sport later in childhood and adolescence. Participation in the programme can also serve to enhance the social skills of participants and to increase their levels of self-efficacy regarding motor skills (Draper et al., 2012).

The results of a study by Nair et al. (2014) revealed that the implementation of the play method can help to improve the mastery of vocabulary among preschool learners, when compared with the conventional method. The findings also suggested that the play method enhanced learners' interest in learning a particular language (Malay) given that the learners found the learning experience more enjoyable and fun-filled. Learners are also able to interact with their friends during the activities, and as such, they master the vocabulary.

The positive insights gained from former research studies supports the present study, where movement activities can support the understanding of numeracy and literacy concepts when integrated into a fun-filled learning experience. Six-year-old preschool learners are in a period of exploration and discovery. They are curious, and through movement, they are able to explore, discover, open up to new opportunities, and grow in all domains of development. This study avers that this innate ability should not go unnoticed, but should be developed further to elevate opportunities that can be beneficial in the lives of these young and vibrant beings.

## **2.6 CONCLUSION**

In light of the above, it is my intent to support the current relationship between movement and the understanding concepts of numeracy and literacy in a preschool learner within the school setting. From a theoretical perspective, and based on an extensive literature review, it is found that there exists a profound positive link of intergrating movement and academic concepts to enhance the understanding of preschool learners. Suitable movement assessment activities (see Appendix H) are designed, and aligned to the fundamental aspects of movement skills and expected numeracy and literacy concepts for six-year-old preschool learners, paying close attention to their developmental domains of cognitive, emotional, as well as social progression. This integrated assessment approach, where movement served as a catalyst, aims to discover the role of movement in understanding academic concepts of numeracy and literacy.

After establishing a strong foundation of theoretical knowledge from the different perspective of theorists, this study aims to corroborate these findings by incorporating the fundamental movement skills of six-year-old learners, and through repetition, enforce refinement in these skills. Movement skills and academic concepts were integrated as a single basis for assessment of learners' understanding during the structured activities.

The extent to which a structured movement educational assessment activity can support six-year-old learners in understanding numeracy and literacy concepts seemed to be favourable. This was further supported by a qualitative research design, where it was my aim to capture data within a qualitative method of inquiry, thus placing emphasis on understanding, changing and adapting the activities to suit the needs of the learners, as well as the teacher.

Similar research conducted in South Africa was limited in scope, as the method of inquiry was quantitative (Krog, & Kruger, 2011). According to these scholars, the following was highlighted: movement is a difficult construct to evaluate using objective, standardised measuring instruments only, and when dealing with young learners, taking into consideration the factors that come into play during the research process.

Chapter 2 permitted me to look closer look at the concepts related to the present study. I elaborated on the skills of movement that can be integrated towards an expanded understanding of academic concepts in preschool learners in an informal environment. Further to this, I was cognisant of the developmental stage of the preschool learner, particularly focusing on the physical, cognitive and social domain. In the next chapter, I elaborate on the research methodology employed in the present study.

---oOo---

## CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY

---

### 3.1 INTRODUCTION

This chapter discusses the research methodology applied to the study and the meta-theoretical paradigm on which the study is based. The chapter also encapsulates a detailed overview of the various steps of the research process employed during the course of investigation. These discussions include the course of action of the sample and sampling methods, in addition to the data collection and data analysis methods employed. A focus on the quality criteria, ethical considerations adhered to, and my role as the researcher, were strongly considered throughout the research process. Lastly, the chapter concludes with the data analysis procedures, followed by the strengths and limitations of the research methodology used in this study.

### 3.2 PARADIGMATIC PERSPECTIVE

#### 3.2.1 INTERPRETIVE PARADIGM

The interpretive ontology employed in this study is the meta-theoretical paradigm. This paradigm seeks to understand and interpret the world in terms of its actors (Cohen et al., 2010). According to McMillan and Schumacher (2010), constructivist researchers use systematic procedures, but maintain that there are multiple socially constructed realities. They also state that researchers' professional judgements and perspective are considered in the interpretation of data, thus placing more emphasis on values and context, rather than on being objective. In light of this knowledge, the social reality is seen as a set of meanings that are constructed by the learners who participate in that reality (Merriam, & Simpson, 2000).

The interpretivist paradigm enables multiple ways of understanding phenomena (Yin, 2009). It allows information to be gathered in person, by interacting with the participants in their setting (MacMillan, & Schumacher, 2010). For purposes of the study, my involvement was primarily in a school setting, where I observed six-year-old preschool learners, engaged in structured movement educational assessment activities, where movement skills, and numeracy and literacy concepts were integrated through the medium of movement.

Whilst engaging in this study, I strongly relied on Schwandt’s (2000) recognition of the three assumptions distinguishing the interpretivist paradigm:

- **Human action as meaningful**
  - Learners engaged in activities, which contained an element of fun.
  
- **The existence of an ethical commitment**
  - To show utmost respect to the participants and respect their space.
  - An ethical obligation to base the findings on the outcome of the participant’s involvement in the structured movement educational assessment activities.
  
- **Striving to emphasise the contribution of human subjectivity to knowledge**
  - As a researcher, the observation of the participants’ actions was meaningful information collected, with the aim of contributing to the findings of the present study.

In light of the above, I explored and described the manner in which the structured movement educational assessment activities within a school setting attributed meaning to the participants from their own perspectives. Mertens (2010) suggests that knowledge could be constructed through an interactive process, which I endorsed for my study, as the participants engaged in movement activities and participated in a group setting with other learners in their class.

Figure 3.1 explains the fundamental elements of the interpretivist paradigm described by Cohen et al. (2003). These include three steps, namely:

ELEMENTS OF INTERPRETIVIST PARADIGM	RELATED TO THE PRESENT STUDY
1. Interpretivist research is naturally completed on a small scale, where human interaction creates social context.	<ul style="list-style-type: none"> <li>• 22 participants</li> <li>• Made up of 12 boys and 8 girls</li> <li>• 2 teachers: 1 class teacher and 1 HOD</li> <li>• In a school setting</li> </ul>
2. The interpretivist paradigm involves a non-statistical approach that allows subjective interactions during observations and semi-structured interviews.	<ul style="list-style-type: none"> <li>• Observing preschool learners activities during structured movement educational assessment activities.</li> <li>• Making field notes and reflecting notes in research journal.</li> <li>• Interview and reflection notes of the class teacher, and obtaining observation sheets from the HOD who participated, this enabling me to understand the process from their perspective.</li> </ul>

ELEMENTS OF INTERPRETIVIST PARADIGM	RELATED TO THE PRESENT STUDY
3. The interpretivist paradigm attempts to uncover and understand experiences and meanings.	<ul style="list-style-type: none"> <li>• Observing the participants in their natural setting.</li> <li>• Observing the participants experience and understanding of the activities.</li> <li>• Engaging in a semi-structured interview with the class teacher and her reflection notes.</li> <li>• Engaging with the observation sheets from the HOD.</li> <li>• Photographs taken during the structured movement educational assessment activities.</li> </ul>

**Figure 3.1: Fundamental elements of the interpretivist paradigm**

### 3.2.2 METHODOLOGICAL PARADIGM

Qualitative methods of data collection were used within the interpretive paradigm to gain a clearer understanding of the specific phenomena. In this study, my aim was to assess the extent to which movement, as medium in a structured movement educational assessment activity, could support six-year-old preschool learners understand numeracy and literacy concepts in a school setting, by employing an interpretive mode of inquiry. A qualitative research paradigm captured the essence of this study, and subsequently followed an interpretivist ontology.

McMillan and Schumacher (2010) describe qualitative research to involve inquiry into meanings, understanding, or nature of knowledge and perspectives, according to the particular theoretical framework and field of study. The most suitable way to conduct this study was through qualitative research as it involves understanding a practical situation (Creswell, 2007).

Qualitative research also follows an emergent design, which evolves and changes as the study takes place (McMillan, & Schumacher, 2010). I followed an inductive approach with a view to collect data to build concepts or theories (Babbie, 2013), by observing the participants in their natural setting, and describing the events as accurately as possible, because qualitative research is distinguished by its focus on phenomena that occur in natural settings, where there is no manipulation or control of behaviour or setting (McMillan, & Schumacher, 2010).

**Table 3.1: Strengths of a qualitative approach**

No.	Qualitative research	Strengths of this approach as identified by Parker et al. (2000)
1.	The research took place at an educational setting, being a school.	<ul style="list-style-type: none"> <li>• Insight into the ways the participants experienced the structured movement educational assessment activities.</li> <li>• Ability to assess how the participants experienced the new activities.</li> </ul>
2.	The key characteristics that followed included observing learners in their natural setting, allowing data to be collected directly from the source in a rich narrative description.	<ul style="list-style-type: none"> <li>• Being able to gain understanding of the participant's context, as well as their environment.</li> </ul>
3.	The design is flexible and can change as the study progresses, where it is imperative to understand the situation from different perspectives.	<ul style="list-style-type: none"> <li>• Gaining an understanding of the process.</li> <li>• Gaining an understanding of the manner in which the research events influenced one another.</li> </ul>

Qualitative inquiry permitted me to ask the class teacher during a semi-structured interview (see Appendix E) to share her ideas, and to build on the general themes which emerged through the study (Creswell, 2008). Rich descriptive data is the essence of qualitative research. Patton (2002) notes that ‘thick description’ provides the foundation for qualitative analysis and reporting. ‘Thick description’ takes the reader into the setting being described in such a way that he/she can understand the phenomenon studied and draw his or her own interpretations about meaning and significance. The study was conducted in a natural setting (in school), which afforded many opportunities to observe and listen to the learners. In this way, it was possible to collect and analyse my observations of the learners and also understand the observations and reflections that stemmed from the teachers’ perspective.

I engaged in a qualitative mode of inquiry to ascribe meaning to the research questions in Chapter 1. Although structured movement educational assessment activities within the school setting are not a new concept, extant research shows the explicit need for such physical activities to be a part of the school setting. My aim is to support the argument for utilisation of structured movement educational assessment activities for six-year-old preschool learners.



### 3.3 CASE STUDY DESIGN

Many research designs are used in qualitative research. Johnson and Christensen (2011) assert that the decision to select a research design depends on the nature of the study, specifically considering the research questions and the research aim that guide this study. Pursuant to this view, and considering it from an interpretivist paradigm, a case study design was selected here, for the fact that it presents an in-depth understanding and meaning of those involved.

A case study could offer the opportunity to work closely with preschool learners, supporting the process of implementation of the structured movement educational assessment activities, as well as the impact, if any, this may have had on the broader understanding of preschool learners. A case study could provide me with the opportunity to observe the extent to which structured movement educational assessment activities allow for the reinforcement of understanding academic concepts through the medium of movement.

According to Yin (2009) case studies are defined according to the following types:

- explanatory case studies – this type of case study would be used if you were seeking to answer a question that sought to explain the presumed causal links in real-life interventions that are too complex for the survey or experimental strategies;
- exploratory case studies – this type of case study is used to explore those situations in which the intervention being evaluated has no clear, single set of outcomes; and
- descriptive case studies – this type of case study is used to describe an intervention or phenomenon and the real-life context in which it occurred.

This study primarily takes the form of the second of these, namely an exploratory case study. This design gave me insight into how learners participated in structured movement educational assessment activities in a school setting. Another advantage of this study design was that it highlighted the unique features within the school setting, which may have been lost in a study on a larger scale (Cohen et al., 2007).

I selected a Muslim school in Pretoria. According to McMillan and Schumacher (2010, p.344), “a case study may be understood as an in-depth analysis of a single entity. It is also a choice of what to investigate.” For this study, the preschool

learners engaged in a bounded system of structured movement educational assessment activities.

McMillan and Schumacher (2010) indicate that the case can be instrumental or intrinsic. For purposes for this study, I selected an instrumental case study design. McMillan and Schumacher (2010) describe this type of case study as a method of understanding a particular theme in a single phenomenon. Creswell (2008, p.476) concurs, and states that an instrumental case “serves the purpose of illuminating a particular issue”, where Fouché (2005, p.272) explains that an instrumental case study is used to elaborate on a theory or to gain a better understanding of an issue. The case simply serves the purpose of facilitating the acquisition of knowledge about the issue.

### **3.3.1 STRENGTHS OF THE DESIGN**

Cohen et al. (2004, p.181) recognise that one of the strengths of a case study is that it observes effects within a real-life context. Babbie et al. (2002, p.282) reinforce the value of an accurate interpretation of contextual factors in case studies. Merriam (1998, p.42) concurs that the advantages of case studies includes that they provide detailed descriptions and explanations about phenomena.

I identify with the above vital characteristics and strengths for case study design. A case study design allows for the exploration of educational movement activities, whilst taking into account the multiple sources of data that inform the study, so as to construct shared meaning. By gaining in-depth understanding of how learners experience movement, the teachers’ observations and reflections, together with my research journal and field notes, yielded rich and personal data.

### **3.3.2 WEAKNESSES OF THIS DESIGN**

Researchers such as Cohen et al. (2007), Blance and Durrheim (2000) and Stake (2005), also brought to light the challenges that may surface when employing a case study design. Table 3.2 provides an overview of these challenges:

**Table 3.2: Challenges of a case study design**

Challenges of a case study design	Efforts to reduce the challenges in the study
Not open to cross-checking, element of potential bias/subjectivity may present itself (Cohen et al., 2007).	Utilised a research journal and engaged with my supervisor on a regular basis.
The potential limitations relating to the validity of information and the testing of results (Blance and Durrheim, 2000).	The meta-theoretical paradigm was that of interpretivism, which enhances the uniqueness of the case.
Generalisability in the case study Stake (2005) may result in finding similarities with other cases.	Participants were sampled purposefully, I adhered to the developmental milestones of preschool learners in general. Exploration of structured movement educational assessment activities is currently a major concern in most schools nationally and internationally.

The research design favoured flexibility, as it evolved through the research process, according to my findings. This idea correlates with Creswell's (1998, p.17) explanation that the qualitative research is complicated by the fact that it does not have firm guidelines or specific procedures, and that it evolves and changes constantly. I therefore needed to be vigilant in making generalisations, and aligned myself within the interpretivist approach, thereby relying on the richness of the data to gain a deeper understanding of the participants' experiences. Table 3.3 presents an overview of the research methodology followed.

### 3.4 RESEARCH METHODOLOGY

**Table 3.3: Overview of the research methodology**

RESEARCH METHODOLOGY	
<b>Research Design</b>	<ul style="list-style-type: none"> <li>Qualitative Case Study</li> </ul>
<b>Selection of participants</b>	<ul style="list-style-type: none"> <li>Sampling procedure: Purposive sampling</li> <li>Total number of participants: 22</li> <li>20 six-year-old preschool learners in Grade R</li> <li>Made up of 12 boys and eight girls</li> <li>Two teachers: one class teacher, one HOD</li> </ul>
<b>Data collection</b>	<ul style="list-style-type: none"> <li>Observation of participants (Field notes)</li> <li>Semi-structured one-on-one interview</li> <li>Research journal, reflection notes, observation sheets</li> <li>Worksheets of learners as document analysis</li> <li>Visual data</li> </ul>
<b>Data documentation</b>	<ul style="list-style-type: none"> <li>Transcriptions</li> </ul>

<b>Data analysis and interpretation</b>	<ul style="list-style-type: none"> <li>• Transcriptions and interview</li> <li>• Qualitative analysis</li> <li>• Triangulation of data</li> </ul>
<b>Quality Criteria</b>	<ul style="list-style-type: none"> <li>• Credibility</li> <li>• Dependability</li> <li>• Confirmability</li> <li>• Transferability</li> </ul>
<b>Ethical Considerations</b>	<ul style="list-style-type: none"> <li>• Informed consent and voluntary participation</li> <li>• Anonymity and privacy</li> <li>• Protection from harm</li> </ul>

### 3.4.1 RESEARCH PARTICIPANTS

Babbie et al. (2002, p.287) suggest a sample of between five and twenty-five participants when engaging in a qualitative enquiry. According to Babbie et al. (2002, p.288), purposeful sampling is the most commonly used sampling method when qualitative research is undertaken. It entails that a small sample is selected, and that inclusion criteria are implemented when selecting the participants (Strydom, & De Vos, 2000, p.198).

Being of limited scope, my study made use of purposeful sampling as a feasible option. Purposeful sampling, as described by Creswell (2008), applies to both individuals and sites. In relation to this, Creswell (1998, p.118) states that the purposeful selection of participants represents a key decision point in qualitative research, and that the researcher ought to have clear criteria in mind for the identification of participants. I adhered to the purposeful sampling strategy to select the participants to participate in the study. The criteria I employed to choose my sample was as follows.

#### 3.4.1.1 Selection of participants

The selection of participants was determined during a meeting with the HOD of the Foundation Phase at the Muslim School. She provided me with insight into the number of classes per grade as well as the ratio of one teacher per 20 learners. Further to this, the developmental domains informed my decision to choose Grade R learners, who all were in the age group of  $\pm$  six years old.

The study was largely based on the subjective analysis of learners and the site to be studied was a school. Purposeful sampling, according to Bless and Higson-Smith (1995), is a sample chosen on the basis of what is considered to be an average

person. Six-year-old learners fall into the category of an “average person”, whose developmental milestones are within the norm, where all the learners in the study will already be in the Grade R setting, where school readiness has also been supported.

In conducting the study, it was important for me to build rapport with all the participants (teachers and preschool learners), so as to ensure that they might be made comfortable with my presence at their school. This was achieved by engaging with them and providing them with a detailed explanation of my role at the school and their willingness to be part of the research process. I also ensured that the participants understood the purpose of the study, and informed them that participation is voluntary, and that they could withdraw from the study, should they feel they are not willing to participate any further. An assent form with simple tick to say ‘yes’ or ‘no’ was given to the learners to fill in.

### 3.4.1.2 Study participants

This study included participants from one class of Grade R learners, comprising 20 learners from a Muslim school in Pretoria, and two teachers (class teacher and HOD), who also participated in the study. Creswell (2008) concurs that for qualitative inquiry, I might intentionally select individuals and sites in order to gain an in-depth exploration of a central phenomenon. The following figure highlights the study participants.



**Figure 3.2: Study participants**

### 3.4.2 DATA COLLECTION TECHNIQUES

Case study research includes a variety of data collection methods, and uses multiple methods in a single case in order to obtain relevant, in-depth and contextually rich information (Rule, & John, 2011). The observations within a qualitative research design are documented in great detail, and the methods of recording can include video recordings, field notes, interviews, documents, and drawings (Leedy, & Ormrod, 2001). These scholars further describe “qualitative researchers are often described as ‘being’ the research instrument because the bulk of their data collection

is dependent on their personal involvement (interviews, observations) in the setting” (2001, p.102).

Babbie et al. (2002, p.279) concur that one of the principles of data collection in case study research is to use multiple sources of evidence, which results in rich and detailed data (Merriam, 1998, p.28; Babbie et al., 2002, p.282; Henning, Van Rensburg, & Smith, 2004, p.42). It also permits triangulation of data. Triangulation is one of the important attributes of qualitative research. Yin (2009) confirms that when triangulation is adopted, evidence is corroborated by ensuring that recurring themes are elicited from the data. A semi-structured interview with class teacher (Appendix E), observation sheets from the HOD (Appendix F), reflection notes from the class teacher (Appendix C), a research journal (Appendix B), analysis of learners worksheets (Appendix J) and photographs, were used to gather data in this study.

I began the data collection process by being a non-participating observer during the structured movement educational assessment activities guided by the class teacher, and documenting the observations (research and field notes) of the participants by observing their verbal and non-verbal behaviour over a period of four days. Photographs were also taken to visually observe the activities on the research site. I engaged with reflection notes from the (class teacher) and the observation sheets from the (HOD) towards the end of each session. This followed a semi-structured interview with the class teacher on the last day of data collection. Learners’ completed worksheets (Appendix K) were also utilised as data.

#### **3.4.2.1 Non-participant observation of the participants**

According to McMillan and Schumacher (2010), observation is the manner in which the researcher is able to see and hear what is occurring naturally at the research site. An important aspect of non-participant observation is the collection of descriptive information in an objective manner, according to defined conditions (Babbie, & Mouton, 2001, p.294). Non-participant observation in this study was based on: (1) gaining in-depth insight into data, which could not be reduced to figures; (2) focusing on the natural experience of the participants; and (3) taking on a dual role of data collector and data interpreter (Strydom, 2002, p.280).

Non-participant observation within a qualitative research paradigm allowed me to study the participants within their natural setting (Fouche, 2005) and assisted in the collection of first-hand information from the participants in the study (Creswell, 2005). I was able to see things which may have gone unnoticed, and access personal

knowledge (Cohen et al., 2010). I focused on gaining information by means of a naturalistic observation during my visits to the school (Cohen et al., 2007). Being a non-participant observer I tried to maintain credibility of my reporting (Mertens, 2010). Field notes are written accounts of what I hear, see, experience and think about both during and after my observations on site (Cohen et al., 2007; Greeff, 2005). Field notes may contain descriptions of key individuals, a running record of what occurred during observation, and comments made by me, which may include reflective notes (Slavin, 2007). Field notes included detailed and comprehensive written descriptions of reactions, actions, comments, body language and other relevant information (Leedy, & Ormrod, 2001, p.102).

In the study, my site was the school. I observed the following:

- the learners' experiences and behaviour during the structured movement educational assessment activities;
- whether the movement stations were practical and learner safe;
- whether direct/indirect assessment of learners' expected outcomes specific to the structured movement educational assessment activities were being met;
- observing the teacher's role as part of the movement educational assessment activity;
- assessing the HOD's observation sheets of the learners during the course of the four days; and
- assessing the learners worksheets after participating in the movement educational assessment activities.

#### **3.4.2.2 A research journal**

Morrow (2005) asserts that a journal is the most valuable way a qualitative researcher is able to maintain a reflexive approach during the research process. A research journal served as a relatively valuable source from which continuous interpretation and analysis could be unearthed about the participants and my experience of the research process (Altrichter, Porsch, & Somekh, 2005). For this study, the research journal reflects my ideas about the study, as well as reflections of methodological phenomenon (Denzin, & Lincoln, 2011).

A journal permitted me to capture mine, the teacher's, and the learners' experiences, by allowing me to collect field notes during non-participant observations, conversations, and thoughts that emerge during the process of data capturing

(Maree, 2010). Observations and reflections were recorded on paper. I combined the notes from my research journal in one document (see Appendix B). The journal allowed me to record my observations and reflect on self-awareness and self-knowledge in the situation being studied (Patton, 2002).

### **3.4.2.3 Semi-structured interview**

According to Robson (2005, p.270), semi-structured interviews have predetermined questions, but that their order can be modified during the interview, based on what seems most appropriate. He also states that semi-structured interviews are widely used in flexible, qualitative designs. I made use of a semi-structured interview to collate the data from the class teacher. The semi-structured interview was used to explore the class teacher's perceptions of the way in which she experienced the structured movement educational assessment activities, whilst facilitating the sessions with learners.

As the interviewer, I liked to ask questions to the interviewee, by pursuing these more in-depth (Hill et al., 2005). The protocol in semi-structured interviews serves as a guide (Flick, 2002), or as a foundation on which the interview is built, but one that allows creativity and flexibility, so as to ensure that the participant's story is fully uncovered. I engaged in a discussion with the class teacher who participated in the activities to elicit information with regard to the activities by using broad and open-ended questions (Vithal, & Jansen, 2012). The use of open-ended questions is flexible and provides an opportunity to elaborate on discussion points.

### **3.4.2.4 Learners' worksheets as part of document analysis**

Documents are a valuable source of information in qualitative research (Creswell, 2008). Creswell further asserts that information from this source can provide valuable information in gathering an understanding of the central phenomena pertaining to the proposed study. They also represent a good source of text data for a qualitative study. For purpose of this study, the learners' worksheets were the documents to be used as sources of data. The learners when inside the classroom, and while seated, were asked to listen to the instruction from the teacher in order to complete worksheets relating to the structured movement educational assessment activity in which they participated. This source of data permitted me to analyse the worksheets to ascertain whether: firstly, the learners understood the concepts demonstrated to them after the structured movement of educational assessment activity were implemented, and secondly, did the learners experience difficulty, whilst



completing the worksheets, when seated inside the classroom and working independently.

### **3.4.2.5 Visual data**

For this study, photographs were included as visual data.<sup>12</sup> The purpose of including visual data is to gain a visual perspective of the data sources and to utilise certain parts of the data for research (Greeff, 2005). The photographs were a form of visual data, vividly displaying the actual event as it took place, and the learners during the educational movement activities at the school during the course of the four days. Consent for photographs was included in the informed consent (see Appendix 3). The school however requested that the photographs, should be printed preferably without faces, due to religious beliefs. The visual images demonstrated the way in which the learners participated in the structured movement educational assessment activities, which enhance the written data sources by means of the visual representation of non-verbal communication (Bailey, 1987, in Greeff, 2005). According to Cohen et al. (2007), an advantage of visual data is that it is both easy to relate to and persuasive in nature.

### **3.4.3 DESIGN OF THE STUDY**

An important point within the qualitative research design is to make the daily work at the school visible, to discuss the ideas and activities with the team of teachers, where this is maintained through observing the activities implemented on a daily basis. A four-stage model (Figure 3.3) will be introduced as a platform upon which the activities will be implemented. This would follow a responsive teaching cycle, as cited in Manning and Mitchell (2011), to set out in action and implement the tasks at hand, as well as to document what is happening, and to frame the events contextually.

A detailed, four-day structured movement educational assessment activities (Appendix H) of 30 minutes a day during the course of four consecutive days (Mon/Tues/Wed/Thurs) for the six-year-old learners was discussed with the class teacher. This was followed by a learners' worksheet (document analysis) to be completed in class with what was supported outside during the structured movement educational assessment activities.

---

<sup>12</sup> Photographs included in Chapter 4.

DAY	ACTIVITIES
Day 1	<ul style="list-style-type: none"> <li>• The implementation of the structured movement educational assessment activity.</li> <li>• The observation of the activities of the programme on a daily basis.</li> <li>• The analysis and documentation of own and teacher's observation.</li> <li>• Reworking the programme the next day.</li> </ul>
Day 2	<ul style="list-style-type: none"> <li>• The implementation of the structured movement educational assessment activity.</li> <li>• The observation of the activities of the programme on a daily basis.</li> <li>• The analysis and documentation of researcher's own as well as teacher's observation.</li> <li>• Reworking the activities the next day.</li> </ul>
Day 3	<ul style="list-style-type: none"> <li>• The implementation of the structured movement educational assessment activity.</li> <li>• The observation of the activities on a daily basis.</li> <li>• The analysis and documentation of the researcher's own and teacher's observation.</li> <li>• Reworking the activities the next day.</li> </ul>
Day 4	<ul style="list-style-type: none"> <li>• The implementation of the structured movement educational assessment activity.</li> <li>• The observation of the activities on a daily basis.</li> <li>• The analysis and documentation of researcher's own and teacher's observation.</li> <li>• Semi-structured interview with the class teacher.</li> </ul>

**Figure 3.3: Four stage model to implement activities**

### 3.5 DATA DOCUMENTATION

According to Babbie (2013), qualitative research uses inductive analysis of data with an intention to gather the data and build on concepts or theories. This is reiterated by Merriam (2009), who asserts that qualitative data analysis is an inductive process. Rabie (2004) reiterates, and explains that the process of qualitative data analysis is to bring about meaning to a situation, rather than to search for the truth. Thematic data analysis was used to present themes that arose from the data that was collected, by classifying it (Ibrahim, 2012). Ibrahim (2012) deliberates thematic analysis suitable for interpreting data. According to Maree and Van der Westhuizen (2010), inductive thematic analysis presents the researcher with multiple realities than any other data analysis strategy.

In this study, I followed an inductive approach in that, I began studying the cases in their natural setting, describing the events as they occurred and as accurately as possible, where lastly, themes emerged as sources of data. The data was documented using hand notes and an audio recording device. The data documentation process comprised of recording the information, and typing up the hand notes, editing, and transcribing the information. This process informed constructing a new reality and creating meaning from the collected data (Flick, 2009). During the study, I remained a non-participating observer over the period of

four days, and during the semi-structured interview with the class teacher, I asked questions that were relevant to answering my research questions. Further to this, I utilised journal notes to document information as it happened during the structured movement educational assessment activities.

### **3.5.1 DATA ANALYSIS AND INTERPRETATION**

The aim of data analysis and interpretation was to make meaning out of information by searching across all data sources (transcriptions, field notes, research journal, observation sheets, reflection notes and visual data) in an attempt to answer research questions. As an interpretivist perspective directed the study, I needed to provide thick description of the research and related processes (Blanche, & Durrheim, 2002).

#### **3.5.1.1 Thematic data analysis**

The analysis of data followed an inductive process, following the thematic analysis technique, which is an ongoing and iterative process (Nieuwenhuis, 2010). This process of analysis firstly began by preparing the data by transcribing all the data. Secondly, I read and listened to the tape recording (semi-structured interview) in combination with my field notes and research journal, observation sheets from the HOD, reflection notes from the teacher, and the transcript from the semi-structured interview. Third, I placed items with similar topics together, and began identifying themes. This enabled me to obtain a comprehensive overview. Lastly, data that reflected the themes most eloquently were chosen with supporting quotations. Literature guided my understanding of my data and interpretation process.

I collected information through the non-participant observations and journal entries, observations from participants during structured movement educational assessment activities in their natural setting by making field notes; secondly, the reflection notes from the class teacher and the observation sheets from the HOD; thirdly, the teacher's semi-structured data; and lastly, analysing the worksheets completed by the learners/participants by documenting if the worksheets were completed successfully or not. The above included: preparing, summarising and organising, exploring and coding the data, describing findings and forming themes, representing and reporting the findings, interpreting the meaning of the findings, and validating the accuracy of the findings as described by Creswell (2008). This process permitted me to subsequently analyse the data collected by generating, classifying, categorising, interpreting, and making meaning of the content.

I wrote memos to make sense of the themes and patterns of information that emerged. I then managed and analysed the collected data by organising it into an orderly format, colour-coding it so that I could draw on certain categories of information, which consisted of themes and possibly sub-themes (see Appendix D). This enables me to be able to identify the relationships between these themes. Understanding the context and interpretation of the general data collected played a key role in understanding the context of the emergent themes, and allowed me to incorporate the data into the research report for the present study (Hartley, 2004).

Greeff (2005, p.299) suggests that the researcher must transcribe and analyse the interviews while they are fresh. I further explain that by employing qualitative analysis, I was able to capture the richness of themes emerging from the data. For the purpose of this study, I transcribed and analysed all data to give a detailed description of the empirical evidence collected.

### **3.6 THE ROLE OF THE RESEARCHER**

A researcher is ethically obliged to ensure that he/she is competent and adequately skilled to undertake the research (Strydom, 2005, p.63). This research study was completed as a partial requirement for my degree to be obtained in Educational Psychology. I received supervision from my supervisor and co-supervisors. I engaged in an extensive literature review (Chapter 2) to empower me with knowledge associated with the research topic, problem statement and associated research questions.

I ensured that all procedures followed during the course of the study complied with ethical codes. I defended my research proposal, which complied with departmental and faculty requirements for a mini-dissertation. I then obtained ethical clearance from the University, before I collected data from the school.

My role as a researcher shifted according to the needs of the research process. I acted as a non-participant observer (researcher) on the field and as a participating researcher during the one-on-one interview (Creswell, 2007; Greef, 2005). I was a critical reader and reviewer in the triangulation process of the data analysis and member checking, and ensured quality criteria were employed. I became a reflective researcher by keeping a research journal to monitor my own actions, biases, responses and thoughts. Throughout the entire process, my role as a researcher was guided by ethical behaviour, so that no intentional harm was done to participants (Ryen, 2004).

### 3.7 ETHICAL CONSIDERATIONS

Strydom (2005, p.57) defines ethics as a group of moral principles that is recommended by a group or an individual, and which is widely accepted. It offers rules and behavioural expectations about the most correct conduct towards experimental subjects and participants and all other persons involved in the research. Strydom (2005, p.67) emphasised that when doing research on human subjects, I should use a code of ethics. I also followed the Council for Counsellors' Code of Ethics (2009) to protect the learners and their parents throughout the study.

A key part of this code is to be respectful of the learners and their parents. The code mentions that research ought to be undertaken with the protection and consideration of the welfare, respect and dignity of the particular client. I felt it crucial to adhere to the following principles as highlighted by McMillan and Schumacher (2010) and Strydom (2005). These guiding principles expanded the quality of the data and also dealt with issues of access and ethics.

#### 3.7.1 INFORMED CONSENT

According to Creswell (2008, p.179), data collection should be ethical and it should respect the individual. Obtaining permission (see Appendix 1 to 4) before starting to collect data is not only part of the informed consent process but is also an ethical practice. Participation must be voluntary. The participants must become aware of their rights and what they are getting involved in when they read and sign a statement giving informed consent, a written agreement to participate should be given by subjects after they learn something about the research procedure. Mouton (2001, p.244) states that human subjects must be informed as to what will happen and their signed consent should be obtained. This section discusses ethical clearance, informed consent and assent, confidentiality, anonymity, non-maleficence, the right of the participant to withdraw from the research at any time, and member-checking. Upon this platform, the following steps were taken to adhere to the research study:

- The first step taken was the application of ethical clearance to ensure the wellbeing of the research participants. Acceptance was granted by the University of Pretoria's ethics committee, which awarded me the permission to conduct my research study.
- The second step followed an appointment to meet with the principal of the school, to explain what my research entailed, and how I would like to utilise

the school as a research site. Permission was granted by the principal to use their facility as a research site, and a subsequent meeting was made by the principal to meet with the HOD and class teacher who would be part of the study. Permission was granted by the HOD to utilise one Grade R class of 20 learners and one class teacher.

- The third step focused on drawing up consent and assent letters, which stated the purpose of the study; how the information was to be collected, used and stored, as well as their rights (Hayes, 2011). The participants were informed about the aims and process of the research before they were asked whether they would be interested in participating. Each parent of the 20 learners signed the consent letter and the preschool learners signed the assent letters.

### **3.7.2 AVOIDANCE OF HARM**

According to Fouka and Mantzorou (2011), a researcher must be aware of any potential discomfort the researcher's research can elicit to its participants. Strydom (2005, p.59), concurs that participants can be harmed in a physical and/or emotional manner. It is given that harm to participants in social sciences will be mainly of an emotional or psychological nature, although physical injury cannot be ruled out completely. I took note of the potential for harm and confirmed that no participants were harmed in any way. Strydom (2005, p.58) notes that there is an ethical obligation for the researcher to avoid any physical or emotional discomfort that may be a result of the study. The nature of this research study did not expose the participants to any emotional harm, especially that which could be foreseen. My role was to observe the learners engage in structured educational movement activities through movement skill acquisition. As a result, no harm was anticipated to the participants in the research study.

### **3.7.3 CONFIDENTIALITY AND PRIVACY**

Mouton (2001, p.243) indicates that in an increasingly public and transparent world scientists have to be extremely watchful in respecting subject's rights to privacy. Mouton also believes that informants have the right to remain anonymous, which refers to the principle that the identity of an individual is kept secret. He states that the conditions of anonymity apply to the collection of data by means of video camera, face-to-face interviews and in participant observation. Creswell (2008, p.179) further states that protecting the anonymity by assigning numbers to returned

instruments and keeping the identity of individual's confidential offers privacy to participants. During data collection, I viewed data as confidential, and did not share it with other participants or individuals outside of the research. I am of the opinion that confidentiality and privacy is of the utmost importance in this study, and therefore, I signed a letter for each parent stating as such. The real names of the learners and the two teachers were kept confidential.

#### **3.7.4 DECEPTION OF PARTICIPANTS**

According to McMillan and Schumacher (2010, p.117) "researchers should generally be open and honest with participants about all aspects of the study" and Strydom (2005, p.61) states that no form of deception should ever be inflicted on participants or participants, and that if this occurs unplanned, it should be rectified immediately. For the purpose of this study deception of the participants was avoided by providing full access to the process and possible outcomes of the research study. I also revealed the goal and process to participants.

#### **3.7.5 VIOLATION OF PRIVACY/ANONYMITY/CONFIDENTIALITY**

Strydom (2005, p.62) states that the responsibility of confidentiality rests with the researcher whether the participant has requested it or not. Furthermore the participants must be assured that information given will be treated with confidentiality. "They must be assured that data will only be used for the stated purpose of the research and that no other person will have access to interview data" (Bless, & Higson-Smith, 2004, p. 101). Within this study, I regarded confidentiality as a priority, and undertook the following steps to ensure that the identity of the participants was not recorded in the study. All information gathered was discussed with my supervisor only, and confidentiality issues were also clarified with the supervisor. Information gathered for the purpose of this study, which contains personal information regarding the participants, was not in any way shared with a third party, apart from the supervisor. All collated data was kept in a secure and locked office. No unconcealed media was used.

#### **3.7.6 RELEASE OR PUBLICATIONS OF THE FINDINGS**

Strydom (2005, p.65) states that the researcher ought to compile the report as accurately and objectively as possible. He further states that the researcher has the obligation to ensure at all times that the investigation proceeds correctly, and that no deception will take place in publication. For the purpose of this study I provide a

mini-dissertation of the research study to be evaluated. This was compiled under the guidance of the supervisor, in accordance with scientifically acceptable norms, procedures, standards and ethical considerations for publication.

### **3.7.7 DEBRIEFING OF THE PARTICIPANTS**

Strydom (2005, p.66) explains that after completion of the research study, the researcher is required to rectify any misperceptions that may have arisen in the minds of the participants. He also states the research study must be a learning process of both the researcher and the participants. In this study, I debriefed the teacher and the HOD, whom I engaged with one-on-one as participants.

## **3.8 METHODOLOGICAL NORMS TO ENSURE QUALITY CRITERIA**

I placed a great deal of attention to the following concepts, which fall within the qualitative research paradigm, to ensure trustworthiness to the proposed research study.

### **3.8.1 CREDIBILITY**

Credibility centres on harmonising between the constructed realities of the participants and those realities represented by the researcher (Sinkovics, Penz, & Ghauri, 2008). To ensure maximum credibility is attained, I utilised triangulation from the multiple data sources, together with member checking, involve examining the identified themes with participants to guarantee their accuracy (Creswell, 2007).

Mertens (2010) asserts that in order to gain credibility, it is vital that I must spend sufficient time in the field before reaching conclusions on the study. I collected various forms of data on site from the participation observation over four days, an interview, a research journal, photographs, reflections and observation notes, and learner worksheets as document analysis. The association of information from the different modalities of the gathered data was confirmed using triangulation.

The research journal also documented my thoughts and emotions throughout the study and debriefing with my supervisor which ensured credibility of my study. I also made use of member checking (Creswell, 2007) with my participants (teacher and HOD) to clarify my understanding of the themes. This process gave clarity as they both expressed that the themes were an accurate reflection of what they had too experienced.



### **3.8.2 DEPENDABILITY**

Dependability focuses on the degree to which the findings can be repeated in other studies (Sinkovics, Penz, & Ghauri, 2008) hence can be defined as the extent of accuracy with which a researcher reports the research findings. This is attained when research results are stable over time, demonstrating the consistency of the findings. Dependability for the study ensued the transcription of the interview and transcribing thereof. I provided rich descriptions of the data collected in accordance with a qualitative design to strengthen the dependability (DiFabio, & Maree, 2012). I used triangulation and crystallisation (Janesick, 2003) which contribute to the overall trustworthiness of the study.

Triangulations allowed me to cross-reference the various results from the different sources of data (research journal, one-on-one semi-structured interview, reflection notes, observation sheets, learners' worksheets as document analysis, photographs) against one another (Gibson, & Brown, 2009). I also consulted with my supervisor during the analysis and interpretation phases to gain another perspective on my findings.

### **3.8.3 CONFIRMABILITY**

According to McMillan and Schumacher (2010), reflexivity can be described as the rigorous self-scrutiny by the researcher throughout the research process. Sinkovics, Penz and Ghauri (2008) meanwhile have defined confirmability as the need for the researcher to confirm that their data and interpretations are grounded in real conditions and circumstances, and that it refers to the degree of neutrality and objectivity of one's findings. Simply stated, confirmability is the objectivity of the study, which can be attained by re-evaluating the data collection and data analysis process for possible biases or misrepresentations of the research findings.

For the study, all the information obtained from the multiple data sources was typed out, namely: the semi-structured interview, non-participant observations, reflection notes, observation sheets, learners worksheets as document analysis, research journal, transcriptions; subsequently allowing the data analysis process to be visually presented on a large cardboard, which was then colour coded. This ensured that my raw data followed a logical and structured analysis process and was reviewed by my supervisor (Maree, Ebersöhn, & Vermaak, 2008).

Confirmability also embraces on the researcher's own self-awareness. A research journal allowed me to document my thoughts, values, beliefs, emotional state and biases, which surfaced during data collection. The data collected is intended to be kept for an acceptable period of time for the possibility of further analysis by other researcher (DiFabio, & Maree, 2012).

#### **3.8.4 TRANSFERABILITY**

Characteristics of a qualitative research design, according to McMillan and Schumacher (2010), is the thick, rich, descriptive data obtained through multiple research techniques, such as observations, field notes, and a journal. According to DiFabio and Maree (2012), the method of cross-validation makes it possible for the findings of this study to be adopted in another setting or context.

The main purpose of this study was to gather information regarding the view of whether structured movement educational assessment activities can facilitate learning numeracy and literacy concepts in a school setting. The outcomes of this study might not be consistent, as it might not lead to the same conclusions, if it were conducted at another time, or by a different group of learners.

#### **3.9 CONCLUSION**

This chapter documented the methodology that I used to collect and analyse the data gathered for the present study. Findings from the data analysis were used to answer the research questions as stated in Chapter 1. The chapter that follows is a presentation of the data analysis and the interpretation of the results.

---oOo---

## CHAPTER 4

# RESEARCH RESULTS AND DISCUSSION

---

### 4.1 INTRODUCTION

In this chapter, I present the results from the study, by arranging and presenting the data under themes, and sub-themes. These themes emerged following an analysis of the data obtained during the data collection processes. The raw data is assessed from various sources, which include: 1) the verbatim transcript from the semi-structured interview held between the class teacher and the researcher, 2) the research journal and subsequent field notes from the researcher made whilst being a non-participating observer, 3) observation sheets from the head of department (HOD), 4) reflection notes from the class teacher, 5) photographs taken during data collection, 6) learners worksheets completed by the participants(learners). The chapter concludes with a discussion of the findings in relation to the relevant literature reviewed. Throughout, I aim to highlight similarities and explain any potential contradictions in the interpretations.

### 4.2 RESULTS FROM THE THEMATIC ANALYSIS

Four main themes and seven sub-themes were identified during the thematic analysis process. The chapter is structured according to the four main themes and sub-themes that emerged. I outline these themes in Table 4.1.

**Table 4.1: Themes and sub-themes**

Themes	Sub-themes
1. The role of movement experiences in understanding academic concepts	<ul style="list-style-type: none"> <li>• Movement activities inform understanding of numeracy and literacy concepts</li> <li>• Experiences of fundamental movement skills support learners' understanding by listening, seeing, and doing</li> </ul>
2. Movement assessment activities support learners to build social skills	<ul style="list-style-type: none"> <li>• Success at movement activities creates teamwork and group participation</li> <li>• Movement activities build social skills</li> </ul>
3. Stimulating apparatus used during movement activities appeals to learners' cognition	<ul style="list-style-type: none"> <li>• Appropriate space and equipment in the movement assessment activity setting enhances a positive atmosphere to support the activities</li> </ul>
4. Identification of learners experiencing difficulty	<ul style="list-style-type: none"> <li>• Movement activities identify learners experiencing difficulty in movement skills in understanding numeracy and literacy concepts</li> <li>• Assimilation of movement skills into classroom teaching</li> </ul>

Table 4.2 illustrates the different abbreviations used when quoting from the different modalities of the collected data.

**Table 4.2: Table of meaning**

Table of meaning			
Abbreviation	Source of information	Appendix	Colour code
TI	Transcripts of interview with class teacher	E	
RJ	Research journal and field notes	B	
TR	Teacher's reflection notes	C	
OSHD	Observation sheet from Head of department (HOD)	F	
PH	Photographs		Photographs
<p><b>Participants in this study include :-</b></p> <ul style="list-style-type: none"> <li>➤ <b>Class teacher</b> who facilitated the activities</li> <li>➤ The <b>HOD</b> who observed the activities</li> <li>➤ The <b>researcher</b> as a non-participating observer; and</li> <li>➤ The <b>six year old preschool learner</b> participants.</li> </ul>			

#### 4.2.1 THEME 1: THE ROLE OF MOVEMENT EXPERIENCES IN UNDERSTANDING ACADEMIC CONCEPTS

This theme describes the benefits of movement and how the role of movement experiences, facilitates learners' understanding of numeracy and literacy concepts in a school setting. Table 4.3 visually represents the subthemes, inclusion and exclusion criteria within Theme 1.

**Table 4.3: Representation of subthemes, inclusion and exclusion criteria in Theme 1**

Theme 1: - The role of movement experiences in understanding academic concepts		
Sub-theme	Inclusion Criteria	Exclusion Criteria (Across both subthemes)
<b>Movement activities inform understanding of academic concepts.</b>	a) Any reference made to the understanding of the basic concepts of numeracy and literacy	<ul style="list-style-type: none"> <li>• Any reference made to gender roles and which group performs better</li> <li>• Any comments made by the class teacher and HOD regarding their personal points of view not related to the learners during the sessions</li> </ul>
	b) Any reference made to incidental learning/observations of activities that were working well.	



Sub-theme	Inclusion Criteria	Exclusion Criteria (Across both subthemes)
	c) Any reference made to the movement repertoire and refinement of skills	<ul style="list-style-type: none"> <li>Any comments and references relating to discipline and behavioural issues</li> </ul>
Movement experiences of fundamental movement skills support learners understanding by listening, seeing and doing.	a) Any reference made to the identification of understanding taking place ie) by listening, seeing, and/or doing b) Any reference made to the movement skills and informal instructions associated with understanding	<ul style="list-style-type: none"> <li>Any comments and instances of instruction made in reference to learners that were not linked to the movement activities</li> </ul>

Table 4.3a below provides an outline of the different themes and the data sources where data regarding the said observations was identified:

**Table 4.3a: Summary of data sources used for thematic identification**

Assessment of data	Semi-structured interview with teacher	Observation sheets from HOD	Research Journal Researcher Observations (Field notes)	Photographs	Learners' Worksheets
Understanding basic concepts of numeracy and literacy	✓	✓	✓	✓	✓
Incidental learning	✓	✓			✓
Movement repertoire and refinement of skills	✓	✓	✓		
Identification of understanding taking place by listening, seeing, doing	✓	✓	✓	✓	✓
Movement skills associated with understanding	✓	✓	✓	✓	
Informal play instruction facilitates understanding	✓	✓			
Activities worked well	✓	✓		✓	
Perceptual motor development	✓	✓	✓	✓	✓

#### 4.2.1.1 SubTheme 1.1: Movement activities inform understanding of academic concepts

The data obtained from the various sources of data modalities, identifies how movement experiences inform the understanding of numeracy and literacy concepts in a school setting. This is an important theme as it sets the foundation for this section of my study. The class teacher and HOD seemed to have had a predominately positive view in relation to the learners' active involvement in the structured movement educational assessment activities. The responses from the teacher and HOD during the four days, suggest that the role of movement can support the learners' understanding of academic concepts.

##### (a) Understanding basic concepts of numeracy and literacy

The rationale behind the movement activities and the understanding of numeracy and literacy concepts for six-year-old preschool learners cannot be over emphasized as an important cognitive domain for effective understanding to take place.

Based on the data obtained, the class teacher made the following comment:

- ❖ *“Yes those colourful concrete blocks actually allowed the children to see that the number and the number of blocks were not the same. You see the abstract and concrete coming together.”* (TI: L38-41, p2)
- ❖ *“it was like a lesson plan with instructions and the activities all had a learning component to be learnt.”* (TI: L45-47, p2)

The class teacher confirms that during the movement activities, understanding was clearer because the learners were visually cognisant of the concrete aids in front of them. Furthermore photograph 4.1 visually demonstrates the active participation of the learners.



**Photograph 4.1:**  
Identification of understanding taking place by making use of visual and concrete blocks

The class teacher confirmed that the idea of play is integrated also a context of learning in the process of –

- ❖ *“what I think worked well was that they were learning through play.”* (TI: L47-48, p2)

The teacher also noted:

- ❖ *“...they were understanding because they followed instructions and they were getting it right and when they did get some things wrong then learning took place at that same time while it was fresh.”* (TI: L54-57, p2)

The above concurs that the understanding of concepts takes place simultaneously. The class teacher highlights that learning takes place through play and concurrently, understanding is reinforced through the medium of movement which can give rise to many benefits for the learners.

The class teacher also highlighted that the movement activities in a group setting inform understanding and seem to benefit the learners, as identified in this comment:

- ❖ *“I was stunned when I saw their mistakes, and then when I rectified it all the children learnt from it as well. If we were at a desk or in a worksheet everyone would not have benefitted from it.”* (TI: 219-223, p8)

Movement activities integrate concepts of numeracy which can serve as an opportunity to assess understanding, as the class teacher again highlighted it as a concept that was understood through the structured movement of educational assessment activities:

- ❖ *“.....that I found was a good way of assessing them and then also you know physically seeing the difference between the big shapes and the small ones, that worked very nicely you know that concept was taught. And then even how you used the long and short strips that is also measurements in the numeracy component that we want our Grade R's to learn.”* (TI: 129-135, p5)



**Photograph 4.2:**  
Identification of understanding of shapes, and  
concept of big and small reinforced

The above statement from the class teacher and photograph 4.2 highlights and refer to the concepts of numeracy being reinforced and learners had to visually observe and identify concepts such as big and small, thick, thin, long, and short. Thus, activating an understanding in particular of the numeracy concept and how it can be applied in everyday activities.

The following statement relates positively to the understanding of concepts because the class teacher feels that the activities were based along the lines of playful and fun activities:

- ❖ *“I love that we could incorporate concepts taught in class like the long-short, big-small. The kids grasped it easier because to them it was seen as a fun game they playing.”* (TR: 19-05-2014, Day 1, p1)
- ❖ *“I liked the concepts of colour and the numbers and then you also added the thickness and long and short. All the mathematical components taught visually.”* (TI: 108-110, p4)

Further to this the learners understood through visual awareness.

The HOD’s observations also corroborate those of the class teacher, where reference is made to learners understanding basic concepts of numeracy and literacy.

- ❖ *“The learners enjoyed the activity and showed knowledge of shapes/colour/matching.”* (OSHD: 20-05-2014, Day 2, p2)

#### **(b) Incidental learning/observations of activities working well**

Indication of incidental learning, movement repertoire and refinement of skills is also highlighted in the following statements:



- ❖ *“The concept long/thick/short/fat/thin were done very well! So many lessons were integrated in one movement session. The ideal situation for good practice in the learning and teaching process.”* (OSHD: 22-05-2014, Day 4, p4)



**Photograph 4.3:**

Concept of numeracy being identified visually by the participant. The participant is engaging in the process of understanding

The data obtained from the research journal where the researcher observes the following:

- ❖ *“I enjoyed the group dynamics, the cheering, the helping of participants to each other, as well as learning from others’ mistakes was in fact learning taking place. Observing others and then gaining the confidence to it themselves was also a phenomenal insight.”* (RJ: 20-05-2014, Day 2, p6)

The above provides evidence to support the conclusion that activities were working well. This was further reiterated by the HOD’s comments, to the effect that

- ❖ *“The activities are good and enhance all kinds of learning.”* (OSHD: 22-05-2014, Day 4, p4)

### **(c) Movement repertoire, refinement of skills**

During the course of the four days, the learners were involved in similar activities with varying levels of difficulty, allowing skills to be refined. The comment below by the HOD emphasise that the repertoire of movement skills allow the learners to master a skill in movement, where –

- ❖ *“The learners have now mastered the activities.”* (OSHD: 22-05-2014, Day 4, p4)

This was further confirmed by the researcher who also stated that

- ❖ *“A lot of repetition took place to reinforce concepts.”* (RJ: 21-05-2014, p8)

adding that:

- ❖ *“Fundamental movement skills are being mastered as their balance and coordination seems to be improving.” (RJ: 21-05-2014, p9)*



**Photograph 4.4:**

Instruction: throwing a bean bag into second hoop with a blue strip. Movement activity integrated numeracy and literacy concepts

#### **4.2.1.2 SubTheme 1.2: Experiences of fundamental movement skills support learners understanding by listening, seeing and doing**

This subtheme draws on the idea of ‘play’ as a means to facilitate understanding, and the perceptual motor development of listening, seeing, and doing as important developmental criteria to enhance understanding. It is safe to assume that the overall success of the activities during the course of the four days is also brought to the fore through the data sources.

The class teacher and HOD view the structured movement educational assessment activities as informing a deeper understanding of numeracy and literacy concepts being assessed through the medium of movement. From the data, it emerged that the learners, view these type of activities as ‘play’. The class teacher and HOD use the word ‘play’ to show that assessment of not only numeracy and literacy concepts were identified, but that learners’ overall development across all physical, cognitive, developmental and social domains of a childhood development were being assessed simultaneously.

##### **(a) Identification of understanding taking place by listening, seeing, doing**

Detailed reference is made to the learners, where they seemed to be understanding while they were listening, seeing and doing. Understanding was taking place because the learners were physically involved in the activity. The above is confirmed by the class teacher’s comments where she says –

- ❖ *“they walk to a shape and colour of the shape I say see the number and then count out blocks for that number, that was nice because there were so many instructions and you know they had to listen.”* (TI: L77-80, p3)
- ❖ *“But I found that the children actually do understand better when they physically involved in the activity.”* (TI: 218-219, p8)



**Photograph 4.5:**  
Participant counting out blocks to match the number

The idea of learners’ understanding being reinforced through the skills of listening, seeing, and doing, is identified in the comments made above.

Comments made by the HOD supports the class teachers comments noting that the learners’ had to be cognisant of instructions in order to perform the activity.

- ❖ *“Activities were challenging. Learners had to be reminded to use to legs, to hop etc. learners needed to be questioned e.g. which side of the hoop is square? Learners were verbalizing their taught through movement. Good.”* (OSHD: Day 2, p2)
- ❖ *“The learners were more involved today, watching, listening and awaiting their turn. Concentration has improved.”* (OSHD: Day 3, p3)

**(b) Movement skills and Informal instructions associated with understanding**

The class teacher reiterates in her reflection notes, aspects within the structured movement educational assessment activities that worked well. These include: the role of movement and skill refinement; and the understanding of concepts taking place simultaneously, as noted in the following excerpts:

- ❖ *“What worked well is when each child had to throw a ball into a specific hoop.”* (TR: 20-05-2014, p2)

- ❖ *“The activity where the children took number of blocks and placed it on correct number card.”* (TR: 19-05-2014, p1)



Photograph 4.6



Photograph 4.7

The HOD also agrees and stated:

- ❖ *“The concept long/thick/short/fat/thin were done very well! So many lessons were integrated in one movement session. The ideal situation for good practice in the learning and teaching process.”* (OSHD: 22-05-2014, Day 4, p4)

The class teacher also expressed her thoughts on what worked well during the course of the days and stated the following:

- ❖ *“What I think worked well was that they were learning through play even though it was specific movement skills like hopping or jumping, you know at the end of the day if it’s not formal then the children enjoy it more.”* (TI: L47-50, p2)
- ❖ *“I feel active learning was taking place. The way they ran through the cones and had to identify the numbers on the left then the right. You noticed how they got confused with left and right.”* (TI: L63-66, p3)

According to the class teacher, the learners seemed to be ‘learning’. This term can positively link to the learners’ optimal understanding of particular concepts which were being demonstrated during the movement skill acquisition which were concurrently being employed during the activities.

Photograph 4.8 below highlights the class teacher’s active participation during the activities she facilitated whilst each learner had an opportunity to do the required activity. The class teacher was seen as encouraging the learner. This involvement

ought to be an integral part of any successful programme to enhance a learner during the physical activity.



Photograph 4.8

The class teacher also highlights the following:

- ❖ *“So I liked that movement was like a game and through that the visual form of size and measurement was taught. Also the cones with the number and I asked them to throw the bean bag to a number, that the group thoroughly enjoyed because you saw they started competing with how far they can throw rather than to the number. But shame they listened.”* (TI: L135-141, p5)

Here reference is made to the various skills of movement, numeracy and literacy concepts being integrated as one lesson plan. The role of movement is seen as enhancing the experiences of the learners and seems to be described as benefitting the learners in a positive way.

- ❖ *“These few days I saw how these kids had to listen, see, move, learn all at the same time so I feel it does work.”* (TI: L196-197, p7)

The class teacher recognises that the learners are understanding through listening, seeing and doing which in turn seems to be benefitting them.

Another comment made by the class teacher with the following comment:

- ❖ *“...learn by doing which is great and how they had to listen to instructions and follow them step by step so even if the first children found difficulty the others saw and copied them which is nice because they saw how it is done and then had a chance to do it better. Also the concept of colour and shape and movement are key in their development.”* (TI: L202-207, p8)

- ❖ *“jee<sup>13</sup> I do feel that learning did take place, most definitely.”* (TI: L231, p9)

The above comment and photograph suggests that there is an association between movement and understanding of academic concepts when presented in a fun manner. The following comment by the HOD is reiterated in this subtheme as her comment also draws on the idea of informal instruction during the activities which were associated to understanding certain concepts for a particular activity.

The HOD explains that the language of movement skills is also associated with understanding:

- ❖ *“Activities were challenging. Learners had to be reminded to use to legs, to hop etc. learners needed to be questioned e.g. which side of the hoop is square? Learners were verbalizing their taught through movement. Good.”* (OSHD: Day 2, p2)



**Photograph 4.9:**  
Learner utilizing movement skills of hopping, and subsequently being cognisant of the numbers visually

- ❖ *“The learners were more involved today, watching, listening and awaiting their turn. Concentration has improved.”* (OSHD: Day 3, p3)
- ❖ *“The activities are good and enhance all kinds of learning. The concept long/thick/short/fat/thin were done very well! So many lessons were integrated in one movement session. The ideal situation for good practice in the learning and teaching process.”* (OSHD: Day 4, p4)

When the class teacher was asked what worked well during the course of the four days, she responded:

- ❖ *“The activity where the children took number of blocks and placed it on correct number card.” “I love that we could incorporate concepts taught in*

<sup>13</sup> An Arabic word which means ‘yes’

*class like the long-short, big-small. The kids grasped it easier because to them it was seen as a fun game they playing.” (TR: 19-05-2014, p1)*

The researcher also agreed with the above comment which was additionally emphasised in the researcher’s research journal. The following was stated:

- ❖ *“Yes I saw how learning across all domains was taking place. Visual, auditory, physical, cognitive as well as emotional was all finding a space within these structured movement educational activities.” (RJ: 20-05-2014 p6)*
- ❖ *“Yes, movement and learning is taking place simultaneously.” (RJ: 20-05-2014, p7)*
- ❖ *“Are the children learning? Yes many concepts are being taught simultaneously, concept such as visual and auditory instructions are also being met in terms of children listening and following certain instructions and visually being able to discriminate between colour form size, etc...” (RJ: 21-05-2014, p8)*

#### **4.2.1.3 Discussion of findings from Theme 1**

I observed, similar to authors below, that; physical activity has been associated positively with academic achievement (Strong et al., 2005, as cited in Tucker, 2008). Research also stipulates that movement experiences have been shown to enhance basic cognitive concepts in developing young children (Walter, 2007), while Kozub (2012) lobbies that promoting physical education as a subject can also support learning in core academic subjects. Similarly Pheloung (1997) additionally describes movement as a strong prerequisite for learning readiness – provides the basis to help the brain integrate in preparation of academic work. It can thus be asserted that the class teachers and HOD’s point of view in relation to their observations of the participants (preschool learners) collaborate strongly with the literature.

Furthermore, Karrabut (2013) states that the brain processes the inflowing information provided through the five senses: hearing, sight, touch, smell and taste, and further explains that physical experience is associated with body orientation and balancing skills. The above provides a fundamentally important idea also identified during data collection, that the experience of being part of structured movement educational assessment activities can facilitate an optimally positive experience in terms of a deeper understanding of academic concepts.

Robinson (2010), maintains that learners move and engage in physical activity through the execution of fundamental motor skills. Through the natural process, fundamental movement skills are learnt very easily. There seems to be a significant amount of evidence in research that identifies preschool years as a positive platform for understanding to take place through the medium of fundamental movement skill acquisition.

The comments identified from the class teacher and HOD's perspective provide justification for the argument that understanding through concrete and abstract forms informs the learners reasoning. Further to this, the identification of understanding taking place through the medium of movement was observed on several occasions, informing the sub-theme of 'experiences of fundamental movement skills support learners understanding by listening, seeing and doing'. Furthermore the subtheme movement repertoire is also recognised amongst many other scholars, including Gagen and Getchell (2006) who agree that continuous practice and instruction of skills are required if one wants to observe results in the learner's performance level and movement repertoire.

#### **4.2.2 THEME 2: MOVEMENT ASSESSMENT ACTIVITIES SUPPORT LEARNERS TO BUILD SOCIAL SKILLS**

This theme describes the social dimensions associated with the experience of the learners during the structured movement educational assessment activities. Teamwork, group participation, healthy competition, positive mood, and positive reinforcement were identified as reinforcing social skills. Table 4.4 visually represents the subthemes, inclusion and exclusion criteria within Theme 2.

Two subthemes were identified in Theme 2. Both these subthemes related significantly well with one another, where the data obtained overlapped on both sub-themes. Therefore the inclusion and exclusion criteria were identified as the same for both sub-themes respectively.



**Table 4.4: Representation of subthemes, inclusion and exclusion criteria in Theme 2**

Theme 2 - Movement assessment activities support learners to build social skills		
Subtheme	Inclusion Criteria	Exclusion Criteria
<b>Success at movement activities creates teamwork and group participation</b> <b>Movement activities build social skills</b>	a) Any references to teamwork and group participation b) Any references to healthy competition and positive reinforcement	<ul style="list-style-type: none"> <li>Any reference to the learners who were misbehaving</li> <li>Any reference to learners' who were not included in the sample</li> <li>Any references to the class teacher discussing challenges of unruly behaviour.</li> </ul>

**Table 4.4a: Summary of data sources used for thematic identification**

Assessment of data	Semi-structured interview with teacher	Observation sheets from HOD	Research Journal Researcher Observations (Field notes)	Photographs	Learners' Worksheets
Teamwork and group participation	✓	✓	✓	✓	✓
Healthy competition and positive reinforcement	✓	✓	✓	✓	✓

**4.2.2.1 SubTheme 2.1: Success at movement activities creates teamwork group participation, and**  
**SubTheme 2.2: Movement activities build social skills**

Theme 2 concerns the learners' expansion of social skills, along the lines of teamwork and group participation, emerging from the movement assessment activities. The building of social skills can be identified as a positive initiative. The two subthemes were identified to have the same inclusion criteria and will be discussed together. Both subthemes identify the sense of collaboration, healthy competition, positive reinforcement, and teamwork as strong contributing features to the main theme.

**(a) Teamwork and group participation**

Teamwork and group participation was typically highlighted by the learner's active involvement in the structured movement educational assessment activities. Furthermore, the responses they shouted out during the activities, to their team-mates suggested that active involvement in a group setting seemed to be taking place. Below are some comments that support the above findings:

Group participation was identified by the class teacher:

- ❖ *"...that was nice and the whole group was involved, you saw they sat there and watched and then started cheering."* (TI: L81-83, p3)

Reference made to the group dynamic as being positive was identified in the following comment by the class teacher

- ❖ *"Also the movement keeps them going, they active and more happy."* (TI: L57-58, p3-4)

The above was additionally emphasised in the research journal, where the learners were described as cheering and laughing, noting a positive mood amongst the participants during the structured movement educational assessment activities:

- ❖ *"Yes as I heard them saying it out loud they were laughing and cheering."* (RJ: 20-05-2014, p7)

Team involvement and supporting each other is also identified as a key aspect that reinforced understanding academic concepts through movement activities, identified by the class teacher:

- ❖ *"And also the other children stepped in to help. So you know the playing actually helped all of them learn."* (TI: L34-35, p2)

and subsequently by the researcher in the following comments:

- ❖ *"They watched their friends participate"* (RJ: 19-05-2014, p3)
- ❖ *"I enjoyed the group dynamics, the cheering, the helping of participants to each other, as well as learning from others mistakes was in fact understanding taking place. Observing others and then gaining the confidence to it themselves was also a phenomenal insight."* (RJ: 20-05-2014, p6)

- ❖ *“The children began working as a team, and cheered each other along the way.”* (RJ: 21-05-2014, p8)

**(b) Healthy competition and positive reinforcement**

Healthy competition is recognised as a positive way of assessing the group dynamics and social interaction which emerges into positive social interaction and teamwork. The learners during the course of the four days seemed to be actively exchanging knowledge and understanding with each other, as well as gaining insight through others’ mistakes. This is supported from the raw data obtained from the transcripts from the semi-structured interview, observation sheets, and the research journal.

- ❖ *“It worked well as the children participated and the group dynamics in terms of listening to each other rather than to the teacher only was maintained.”* (RJ: 22-05-2014. P.10).
- ❖ *The group of children began interacting and supporting each other during the activities* (RJ: 19-05-2014, p3)
- ❖ *The children were all too eager to participate, and began enjoying the activities.”* (RJ: 19-05-2014, p3)

The class teacher also emphasizes that the learners:

- ❖ *“they seemed to be all involved.”* (TI: L85, p3)
- ❖ *“I really liked the involvement of them and they were not bored because you saw I included them and asked them individually if the child was right.”* (TI: L86-87, p4)
- ❖ *“Well I think and you also saw they were enjoying it and you know they all interacted with each other and they were having fun.”* (TI: L149-151, p6)

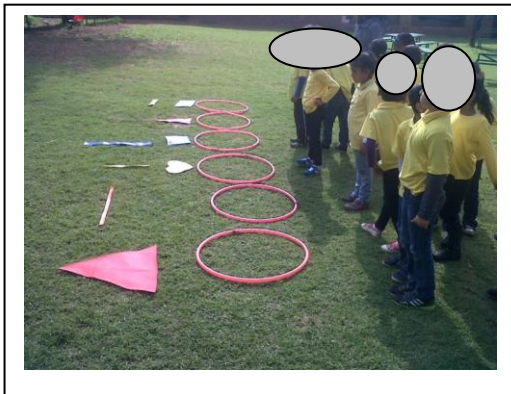
Furthermore healthy competition and positive reinforcement were identified in the research journal where direct quotes from the learners’ were transcribed when one learner threw a block:

- ❖ *The child threw the block, and all the other children cheered. Comments such as “Aaah man, yes I got it in, Yes its right, Oh no I missed” The teacher motivated the children with comments such as “well done, you got it in, oh no that’s fine, you aimed at the right hoop but the block rolled over, you threw it too fast, aim and throw slowly.”* (RJ: 22-05-2014, p9-10)

Comments from the research journal with regard to the above stated:

- ❖ *“...this activity allowed each child to participate, and the children wanted to have more turns, the children also commented to say “ooh it went into the green thick strip, not the blue thick one.” (RJ: 22-05-2014, p10)*

The following photographs are included to visually represent the learners in a group setting during the research process. Photographs 4.10 to 4.12 are included as sources of data to support the findings and to visually represent the group dynamics presented during the course of the four days.



**Photograph 4.10:**  
Photograph taken of the participants participating in a group



**Photograph 4.11:**  
Positive reinforcement identified, the children are cheering for their team player



**Photograph 4.12:**  
Teamwork and group participation. Learners' are taking turns and moving in a line. They are observing when it is not their turn and shouting in support for their team mate

#### 4.2.2.2 Discussion of findings from Theme 2

Theme 2 provides evidence which maintains and confirms that during infancy and early preschool years, learners use their motor skills to explore the environment, engage in physical play, initiate social interactions, and develop basic academic skills (Clark, 1994; Robinson et al., 2015). Theme 2 identifies social development of preschool learners as a strong contributing factor in child development. Social development emerged as a relevant theme, and is supported with research from

scholars as early as Sherborne (1990), who avers the importance of the social and emotional foundations in movement, where she identified two basic needs in all learners, namely to feel at home in their bodies, and by doing so, first to develop mastery over the body and second, to form relationships with others. The above correlates with the movement activities where both basic needs stated above seem to have been fulfilled.

Teamwork and group participation is identified from the works of Johnson and Johnson's (1999) theory of cooperation. This theory encourages working together to accomplish shared goals. Johnson and Johnson's cooperative sub-skills of: (1) helping (2) turn taking (3) sharing (4) division of labour (5) negotiation (6) ability to coordinate effort (7) exchange complimentary pieces of information, and (8) perspective taking. These were identified significantly in the data, where the learners engaged in movement activities, and engaged in turn taking, helping each other, etc. Opportunities where the learners participated in movement activities, whilst at the same time being supported by their teammates are evident in most activities.

Campbell (2006, pp.34-35) also collaborates with the above and explains that throughout the preschool period, children continue to demonstrate advances in cognitive and social development that are reflected in more complex reasoning and language skills, an emerging self-awareness and understanding of the feelings and thoughts of others, improved ability to balance one's own needs with the needs of their peers during social interaction and increased knowledge of the physical world.

The above corroborates the underlying theme of social development as being a positive influence in a learners' life. A recent study by Gehris, Gooze and Whitaker (2014) explores preschool learners movement experiences. One of the themes that emanated from this research and which supports the present study is these authors' assertion that success at movement tasks builds children's self-confidence.

Observations and transcripts from the class teacher, HOD, and the researcher exhibit a strong sense of group dynamics, and positive reinforcement, all typically identified as relevant subthemes within the broader theme of 'movement assessment activities support learners to build social skills'. The creation of these sub-themes was guided by those factors discussed in literature to show a positive link to movement experiences and social development. This in turn can also promote social as well as emotional development seeing that there is engagement in group activities. Stork and Sanders (2008) note that the positive effect of physical activity

on the cognitive, social, and physical development of young learners is generally recognised.

#### 4.2.3 THEME 3: STIMULATING APPARATUS USED DURING MOVEMENT ACTIVITIES APPEALS TO LEARNERS' COGNITION

This theme describes how a stimulating environment appealed to the learners' cognition. The stimulating environment included equipment and different types of apparatus with the view of creating a positive space for the learners. Table 4.5 visually represents the subthemes, inclusion and exclusion criteria within Theme 3.

**Table 4.5: Representation of subthemes, inclusion and exclusion criteria in Theme 3**

Theme 3 - Stimulating apparatus used during movement activities appeals to learners cognition		
Subtheme	Inclusion Criteria	Exclusion Criteria
Appropriate space and equipment in the movement assessment activity setting	a) Any reference made to aesthetic, colours, and visually appealing environment b) Any reference made on the planning structures c) Any reference made to the adaptability of the activities	a) Any comment or reference made to the role of the teacher and her management skills b) Any reference made to the type of materials used as apparatus c) Any reference made on the observation of the HOD to discuss control and management of the teacher inside and outside the classroom.

**Table 4.5a: Summary of data sources used for thematic identification**

Assessment of data	Semi-structured interview with teacher	Observation sheets from HOD	Research Journal Researcher Observations	Photographs	Learners' Worksheets
Aesthetic and colours	✓	✓	✓	✓	
Visually appealing	✓	✓	✓	✓	
Appeal to cognition	✓	✓		✓	
Planning structures	✓	✓	✓	✓	

#### 4.2.3.1 SubTheme 3.1: Appropriate space and equipment in the movement assessment activity setting

The creation of this sub-theme was guided by factors such as the aesthetics, space, colours of the apparatus as being visually appealing, the planning structures that were adhered to during the course of the four days, and the adaptability of the activities. It is apparent from the data sources that the appealing and colourful space created for the movement activities brings forth a positive atmosphere where understanding is enhanced.

##### (a) Aesthetic, colours, visually appealing

The description of the space was identified by the HOD where she states that the:

- ❖ *“Equipment was colourful and attractive.”* (OSHD: Day 2, p2)
- ❖ *“Colourful apparatus also made an impression to the learner. Good.”* (OSHD: Day 3, p3)
- ❖ *“Attractive and well-spaced.”* (OSHD: Day 4, p4)

The following photographs also visually display the layout of the equipment.



**Photograph 4.13:**  
The apparatus used during the research



**Photograph 4.14:**  
Cones, blocks, number blocks, hoola hoops, and colourful shapes



**Photograph 4.15:**  
The apparatus used during the research

The above observations were additionally observed by the researcher in her reflective journal, stating the following:

- ❖ *“The movement stations looked very inviting, and the children were very enthusiastic.”* (RJ: 19-05-2014, p2)
- ❖ *“The apparatus looks very appealing and colourful. Very bright and cheerful for the children.”* (RJ: 21-05-2014, p8)

Reference is made to the stimulating apparatus used to inform understanding of numeracy and literacy concepts. The concrete objects appeal to the learners' cognition.

#### **(a) The planning structures**

The class teacher places much emphasis on the equipment and planning by commenting on the following:

- ❖ *“Yes those colourful concrete blocks actually allowed the children to see that the number and the number of blocks were not the same. You see the abstract and concrete coming together.”* (TI: L38, p2)
- ❖ *“when we placed the hoops horizontally then all the children could see.”* (TI: L92-93, p4)
- ❖ *“...I liked the concepts of colour and the numbers and then you also added the thickness and long and short.”* (TI: L108-109, p4)

Here, reference is made from the opinion of the class teacher who expresses that the stimulating environment appealed to the learner's cognition. Further to this, she also identified that the planning structures facilitated the understanding of concepts being enhanced by means of the visually appealing apparatus used. Reference again is made to how concrete objects inform understanding of abstract concepts in a visual way. The positive impact of understanding facilitated through the medium of a stimulating environment with colours and age-appropriate apparatus as expressed by the class teacher and HOD brings to mind that the idea of the activities was meaningful. Therefore it appears as though from the observations and the transcript, a stimulating environment can create an enthusiasm for gaining an understanding of academic concepts. Further to this, comments shouted out by the learners highlighted that they too seemed to appreciate the equipment.



#### **4.2.3.2 Discussion of findings from Theme 3**

The success of a movement activity is echoed from research by Giagazoglou et al. (2008), highlighting the influence of preschool-type setting on children's gross motor development. Results from this study revealed that learners who have plenty of open space for play, and playgrounds as well as daily exercise physical activity programmes, display a higher gross motor score than do those children who participated in limited spaces and do not have any physical education lessons into their schedule. Further to this, research by Gagen and Getchell (2006) stresses the importance of choosing developmentally appropriate activities, and in selecting appropriate equipment with which to perform movement activities. These scholars concur that without these skills, learners may not absorb a love of activity, nor will they become capable enough in movement to encourage them to become lifelong movers practicing healthy lifestyle choices.

The above findings support Theme 3 as an important process for the optimal success of movement activities. This is supported by Palmer et al. (2016) who in their research study also included items such as playground balls, cones, jump ropes, scarves, and hula hoops, to design and set up for motor skill stations. The idea of the motor skill station was to initiate a game designed to get the learners up and active. Palmer et al. (2016) supported the idea by stating that such stations can also serve as an opportunity to reinforce classroom academic concepts such as numbers, letters, or other lessons. These findings fall directly in line with the current study.

Gallahue and Donnelly (2003) accept that when cognitive concepts are demonstrated through the medium of movement, active participation reinforces fun. They further state that when learners engage in activities that involve teaching an academic concept, their attention is not as easily diverted as when they are learning in a less active classroom setting. This was identified in the data sources even in Theme 1.

#### **4.2.4 THEME 4: IDENTIFICATION OF LEARNERS EXPERIENCING DIFFICULTY**

Theme 4 identifies the challenges experienced whilst the learners' engaged in the movement activities as opposed to when they were seated in a classroom setting completing worksheets. This theme was selected as it brought forth aspects such as the difficulties experienced with the movement skill itself, as well as challenges experienced with a numeracy and/or literacy concept.

**Table 4.6: Representation of subthemes, inclusion and exclusion criteria in Theme 4**

Theme 4 - Identification of learners experiencing difficulty		
Subthemes	Inclusion Criteria	Exclusion Criteria
<b>Movement experiences identify learners experiencing difficulty in movement skills, and challenges in understanding numeracy and literacy concepts</b>	a) Any reference to movement difficulties and mistakes identified in numeracy and literacy concepts experienced during the sessions	<ul style="list-style-type: none"> <li>Any reference made to behaviour of a learner in another context</li> <li>Any reference to flexible grouping to manage behaviour</li> <li>Any reference made to instances during observations that showed how the teacher's knowledge of the learner's interest was used to motivate the learner and how instruction was linked the learner's interest</li> </ul>
	b) Any comments or references made to repeating the movement skill	
	c) Any reference made to supporting the identified learner to complete the specific task	
<b>Assimilation of movement skills into classroom teaching</b>	a) Any reference made to information manifest in the learners worksheets	<ul style="list-style-type: none"> <li>Any reference made from the researcher's observation during the time of filling in the assent forms</li> </ul>

**Table 4.6a: Summary of data sources used for thematic identification**

Assessment of data	Semi-structured interview with teacher	Observation sheets from HOD	Research Journal Researcher Observations (Field notes)	Photographs	Learners' Worksheets
Immediate feedback of mistakes encountered	✓	✓	✓		
Learning difficulties	✓	✓		✓	
Movement difficulties	✓	✓	✓	✓	
Repeating the movement skill	✓	✓	✓		
Supporting the identified learner to complete the specific task	✓	✓	✓	✓	✓
Information manifesting from the learners worksheets				✓	✓

#### 4.2.4.1 SubTheme 4.1: Movement experiences identify learners experiencing difficulty in movement skills, and challenges in understanding numeracy and literacy concepts

During the activities, many learners seemed to face some manner of challenge with regard to a movement skill, numeracy, and/or literacy concept. This was identified by the class teacher, HOD, and researcher. The following is discussed:

##### (a) Movement difficulties and mistakes identified in numeracy and literacy concepts experienced during the sessions

The analysis of the data demonstrated evidence of learners experiencing difficulty with the different skills of movement as well as concepts of numeracy and literacy during the activities. Specifically, these include movement skill difficulty, and mistakes identified with counting. The teacher expresses the following:

- ❖ *“I must say it’s shocking to see that some children can’t do the movement. It was so easily picked up.”* (TI: L15-16, p1)
- ❖ *“I must say that I was surprised to see the mistakes they made with the concrete and abstract.”* (TI: L26, p1)
- ❖ *“When the one girl had to place the blocks to the correct number, I can’t remember how many but she placed less blocks to the actual number. I must admit it was very good to see visually the mistakes she made and then rectifying it.”* (TI: L30-33, p2)



**Photograph 4.16:**  
Visual representation of a learner counting out blocks to match the number 6

The above was also identified by the HOD who made an observable note of the mistake encountered.

- ❖ *“Yes, one learner did not apply the number concept that was needed. Instead of placing six blocks she placed seven.”* (OSHD: Day 1, p1)

Furthermore, the direct quote from the research journal gives an in-depth explanation of how the teacher facilitated the above:

- ❖ *One girl got it incorrect, the teacher asked the girl “What number is this?” the other kids shouted out “number seven”, the teacher asked the girl, and she replied seven. The teacher asked the girl to count the blocks, the girl said “1, 2, 3, 4, 5, 6”, the teacher said “go and get another block to make it seven” the teacher and the four children count it again and see the correction.* (RJ: 22-05-2014, p9)

In light of the above, it would seem that the class teacher views herself as a source of personal and social guidance for the learners in her classroom. Tasks related to guiding the learners in their educational, personal and social development is identified from the data transcript. Furthermore, the class teacher mentioned that she would like to delve further by supporting the learner identified as experiencing difficulties.

In addition to this, the class teacher placed emphasis on the following:

- ❖ *“It was easy to identify the learners with poor listening skills, who did not respond immediately to instructions”.* (TR: 19-05-2014, p1)
- ❖ *“I was stunned when I saw their mistakes, and then when I rectified it all the children learnt from it as well.”* (TI: L219-221, p8)

The teacher identifies the above mistakes as a learning opportunity for the other learners, making the numeracy and literacy concepts more understandable by utilising the opportunity pedagogically to enhance their understanding. The above observations were also evident from the observations made by the HOD:

- ❖ *“Counting. Instead of 7 she said 6.”* (OSHD: 22-05-2014, Day 4, p4)

In addition, the researcher observed the following:

- ❖ *5 boys were unable to identify their left side and right side*
- ❖ *4 boys did not jump on two feet*
- ❖ *1 boy could not jump on two feet, and lost his balance*
- ❖ *The others managed to jump and maintained balance*
- ❖ *4 boys confused colour and shapes.* (RJ: 20-05-2014, p5)

The comments below highlight the astonishment of both the class teacher and HOD during their observations of the learners all through the movement activities.

- ❖ *“You noticed how they got confused with left and right.”* (TI: L65-66, p3)
- ❖ *“It was actually shocking that some children, like the one I pointed to, was not coping with the movement.”* (TI: L96-97, p4)
- ❖ *“...and how they had to listen to instructions and follow them step by step so even if the first children found difficulty the others saw and copied them.”* (TI: L202-204, p8)

In addition, according to the class teacher, the role of movement assessed learners who were identified as making mistakes.

- ❖ *“I was surprised to see the mistakes they made with the abstract and concrete”* (TI: L26-27, p1)

In addition, the following was also elicited from the reflections from the research journal:

- ❖ *“One child reversed the number 2 for the number 5. The teacher immediately corrected this and also went on and showed them the number 6 and the number 9, explain to them how the two numbers can become confusing.”* (RJ:19-05-2014, p3)

Another reflection from the research journal, demonstrating the difficulty with movement skill and perceptual development:

- ❖ *“I felt that laterality was a problem as the children seemed to get confused with left and right. But other concepts were being constantly reinforced. I found that counting out the numbers to the blocks was problematic for some but the teacher spent time reinforcing the concept. Also if a child ran too fast through the cones or did not maintain balance, the teacher redirected the child to do it and refined the skill.”* (RJ: 22-05-2014, p10)

## **(b) Repeating the movement skill**

Movement repertoire is identified as an important skill as the following was identified from the different data sources:

- ❖ *One boy found difficulty hopping on one leg, another boy was unable to maintain balance.* (RJ: 22-05-2014, p9)
- ❖ *What worked well is when each child had to throw a ball into a specific hoop.* (TR: 20-05-2014, p2)

- ❖ *One learner got confused /forgot the sequence or pattern when jumping* (OSHD: Day 2, p2)
- ❖ *“I absolutely enjoyed today’s activities with the learners. I particularly appreciated how the concepts were being reinforced through movement. Problem learners also engaged and benefitted from the activities.”* (TR: 20-05-2014, p2)

The above comments demonstrate the effectiveness of including movement activities into understanding numeracy and literacy concepts. From the data it emerged that both the class teacher and the HOD found this mode of assessment a feasible option as learners who seemed to be experiencing difficulty were identified very quickly. Furthermore they mentioned that repetition of a particular skill at that time benefitted the learner in a positive way. In addition, the class teacher seemed to play a positive role, where she was adhering to the principle of the ‘Zone of Proximal development’ scaffolding each learner supporting them to be confident and meeting them at their level to assist them on to a higher level of understanding.

### **(c) Supporting the identified learner to complete the specific task**

According to the class teacher, the following was transcribed:

- ❖ *“But I found that the children actually do understand better when they physically involved in the activity. I was stunned when I saw their mistakes, and then when I rectified it all the children learnt from it as well.”* (TI: L218-221, p8)

The above comment filters into Theme 2 where reference is made to mistakes being identified and rectified within a group, important to the social dimensions attached to the study which can benefit both the learner and the class teacher. Furthermore the class teacher discusses that if and when a learner is identified, extra measures can be taken such as supporting that particular learner with the difficulty identified. The above was reiterated by the class teacher to support this comment

- ❖ *“...can identify them and then work on that particular skill.”* (TI: L105, p4)

Another observation from the research journal identified the class teacher as supporting a learner with a specific task was also observed in these notes:

- *“Whilst the girls were taking turns, one little girl went to her teacher and said “Appa I don’t want to do this I don’t know what to say,” I was very impressed*

*with the way the teacher managed this, she brought the little girl next to her and as the other girls were participating, she asked the anxious little girl to listen to the others, and even repeated the shapes and colours as the other girls said it. The teacher motivated the little girl and encouraged her to participate, she did and was very shy and spoke very softly, but managed the movement skill, as well as recognized the shape and colour.” (RJ: 20-05-2014, p6)*

Based on the above results, it can be asserted that the class teacher played an active role in supporting the learners experiencing difficulty with particular skills of movement, numeracy or/and literacy concepts. Reinforcing the concept and allowing the learners to practice a particular movement skill enhanced understanding for the learner.

In this study, it is evident that the class teacher and the HOD view one of their main responsibilities as engaging with the learners when they are experiencing difficulties. This is particularly driven by their understanding of their role as a teacher to provide a meaningful experience in a school setting. The data provided above demonstrates that the class teacher ensures that she can identify learners experiencing difficulty, providing an atmosphere where the group participates in a learning experience.

The following photographs 4.17 and 4.18 included as sources of data to visually represent some of the mistakes made by the learners.



**Photograph 4.17:**  
Movement skill, numeracy concept and listening skill. Learner counted incorrectly

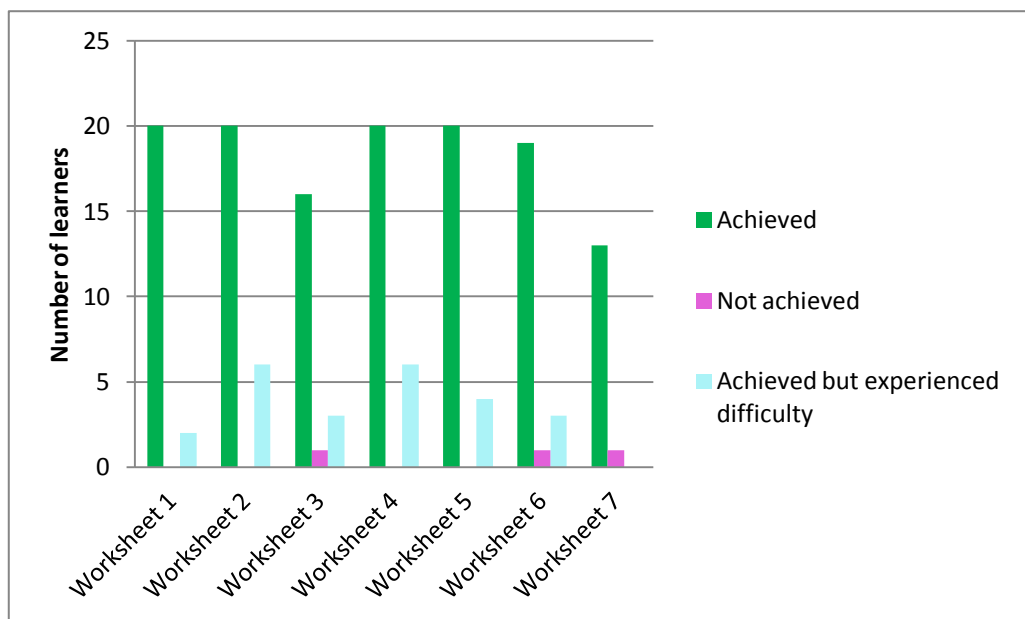


**Photograph 4.18:**  
Concepts of shape, colour, number identification. Learner attempting it for the second time

#### 4.2.4.2 Sub-Theme 4.2: Assimilation of movement skills into classroom teaching

Twenty learners completed a total of seven worksheets over a period of two days of data collection after completing the movement activities. The idea of the worksheet is to assess if the learners' grasped an understanding of what took place during the structured movement educational assessment activities.

Figure 4.7 represents a graph, which visually depicts all the worksheets<sup>14</sup> that were completed by the learners. Further to this, the graph displays three categories of the learners results obtained from the worksheets:



**Figure 4.1: Graph displaying the worksheets completed by the learners**

- **Worksheet 1: Learners were required to fill in the missing number in the space provided**

10% of Learners experienced difficulty with handwriting

- **Worksheet 2: Learners were required to colour in the thin rectangles blue and thick rectangles yellow**

30% of learners experienced difficulty with colouring inside the lines and shading properly

<sup>14</sup> Appendix I – Samples of worksheets from the learners.



- **Worksheet 3: Learners were required to fill in the missing number in the space provided**

15% of learners experienced writing difficulty

- **Worksheet 4: Learners were required to colour in the big triangle red and the smaller one blue**

30% of learners required assistance

- **Worksheet 5: Learners were required to colour in the square green, the circle orange and count the amount of squares on the page and the amount of circles on the page**

20% of learners had difficulty shading properly

- **Worksheet 6: Learners were required to identify the number, count the amount of dots next to the number 1 and write the number 1 in the block**

15% of learners experienced difficulty writing and shading properly

- **Worksheet 7: Learners were required to portray what they had done in the last 4 days in a drawing**

0% of learners did not experience any difficulty (they could draw anything, so no difficulties were found)

#### **(a) Information manifesting from the learners worksheets**

The findings from the worksheets illustrate that whilst the learners were seated in the classroom and the instructions were read to them by the class teacher who facilitated them to complete the worksheets correctly, the learners made fewer mistakes with numeracy and literacy concepts as opposed to when they were actively involved in the structured movement educational assessment activities.

The following statements from the research journal:

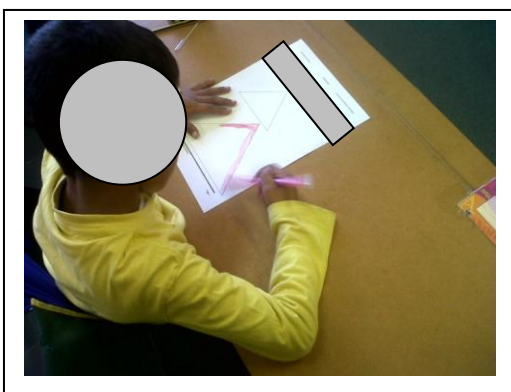
- ❖ *“The teacher guided the learners into completing the worksheets accurately rather than allowing them to do it on their own.”*
- ❖ *“I felt there was too much of involvement from the teacher in completing the worksheets and also they were not done consecutively over a period of four*

*days but rather on two days where the teacher completed them one after the other.”*

- ❖ *“I am feeling disappointed as the process did not go as I had planned it but I feel that rote learning was present in this setting as the teacher pinpointed to the shapes and asked them to pick up the crayon to make sure it was the correct colour and directed them to completing the activity.”*
- ❖ *“Finally in this worksheet the teacher instructed them to draw whatever they like in that their experience of what happened over these last four days, I’m impressed because almost all the children are drawing the apparatus and the shapes, and the hoops.” (RJ: p11)*

The analysis of the worksheets display mistakes made with aspects of too big and small handwriting and colouring techniques, such as going out of the line and untidy work. However the concepts of numeracy and literacy as highlighted in the worksheets were completed successfully by most learners with the guidance of the class teacher. It is evident that when the learners engaged in the movement activities where concepts of numeracy and literacy were integrated, more mistakes, difficulties, and challenges were visible whereas during the classroom activity of worksheets to be completed, similar mistakes, difficulties, and challenges were not visible. The movement activities also brought forth the mistakes and difficulties experienced by the learners and their peers, when all the learners became aware of each other’s mistakes and this was rectified immediately creating an immediate understanding through the group dynamics present during these activities. This was not identified when worksheets were being completed.

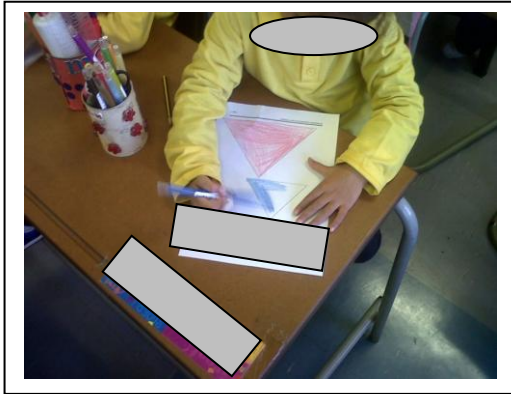
Photographs 4.19, 4.20, and 4.21 included as sources of data to visually display the learners completing the worksheets.



**Photograph 4.19:**  
Worksheet 4



**Photograph 4.20:**  
Worksheet 4



**Photograph 4.21:**  
Worksheet 4

#### **4.2.5 DISCUSSION OF FINDINGS FROM THEME 4**

The theme of learners experiencing difficulty was viewed from two perspectives. First, the learners engaged in the movement activities, and second, the learners sat behind a desk completing worksheets related to the movement activities already administered outside. It was evident that some of the learners experienced difficulty with specific skills whilst engaging in the structured movement educational assessment activities.

This theme is a significant feature as it aligns with research showing movement to be a strong prerequisite for learning readiness, where it provides the basis to for helping the brain integrate in preparation for academic work (Pheloung, 1997). Further to this, earlier scholars such as Delacato (1959, 1974), Cratty (1972, 1973), Kephart (1975) and Ayres (1979) also comment on the relation between movement and successful understanding. These scholars' works assumed that movement reflects neural organisation and provides the stimulation to neurological systems that are necessary for optimal development and functioning. The sub-themes that emerge from the data correlate with Karabulut (2013, p.3) further suggesting that the importance of well-balanced sensory development and the role of the cerebellum is responsible for all movement, and well-balanced communication between the two brain halves, are whole body experiences. In order for the brain to cope with the demands of formal education, it needs to be exposed to as well as to learn to deal with a rich variety of sensory and motor experiences, at home, as well as in a school environment. Based on existing literature, it can be said that the movement experiences in turn benefit the learner as the importance of perceptual motor development as highlighted are some of the challenges, the learners faced whilst engaging in the activities. This is supported by Krog and Kruger (2011, p.72), who claim that each system has a sensory organ through which information is gained and primary actions are initiated, where they depend on each other for interpretation of

information, and for movement. This was clearly evident in the movement activities conducted as part of this study.

Researchers such as Bond et al. (2011), in recent years have argued that the area of motor skills has tended not to be a high priority for schools, and has since become an area which they have been actively encouraged to target. The studies pertaining to motor skills interventions to date have also not addressed the wider issue of implementing physical activities in school settings. There is evidence to suggest that there is a need for school-based interventions for learners with motor skill difficulties (Bond et al., 2011). Similarly, Dotterweich, Greene, and Blosser (2012), confirm this view, by stating that physical activity provides a myriad of academic benefits, including an improvement in concentration and attention. In young learners, play and physical activity are closely connected. Free play is vital for the learner's overall development, serving multiple important functions in their emotional, social, motor and cognitive development (Kreichauf, Wildgruber, Krombholz, Gibson Vögele, Nixon, Douthwaite, Moore, Manios, & Summerbell, 2012). These scholars also feel that physical activity can and should be integrated into the daily routines and the existing curriculum of preschools, and ought not to be seen as something competing with other educational goals.

The benefits of including movement into the school setting is reinforced throughout literature supporting my view, where movement filters positively through all aspects of the developing learner. It promotes well-being and good health, reduces fatigue, activates the cognitive domain for active understanding to take place, and promotes positive social integration. Movement activities provide constructive, beneficial, and practical elements into the lives of preschool learners, with a view to uplifting them physically, cognitively, emotionally and socially.

### **4.3 CONCLUSION**

The themes that were elicited during the analysis of the research data have been described in detail in this chapter. The following chapter will discuss the findings described in this chapter in terms of relevant literature on the topic. The research questions posed in Chapter 1 will be addressed through the findings of the study.

The limitations and contributions of the study will also be described before recommendations are made for psychology practice and further research. Finally, concluding comments will be given.

## CHAPTER 5

# CONCLUSIONS AND RECOMMENDATIONS

---

### 5.1 OVERVIEW OF THE PREVIOUS CHAPTERS

Chapter 1 provided an introduction to the study, by discussing the problem statement and the purpose of the study, the conceptual framework and the methodological paradigm used. This was followed by the literature review in Chapter 2, which investigated literature focused on the role of movement in understanding numeracy and literacy concepts for preschool learners, with the aim of understanding and assessing the benefit of movement when integrated with numeracy and literacy concepts. Chapter 3 focused on the research process, the research design, and the methodology of this study. In the previous chapter, I outlined the results of this study by presenting themes and subthemes that emerged from the data by utilising the thematic analysis process.

This chapter provides a conclusion and possible recommendations to the summary of the findings of the study, and compares them to existing literature regarding the role of movement and the way in which movement activities can benefit understanding of numeracy and literacy concepts for a preschool learner. The research questions presented in Chapter 1 will be addressed. The limitations and contributions of the study will be discussed, and finally, recommendations will be made regarding further research and implications for educational psychology practice.

### 5.2 INTRODUCTION

This study aimed to investigate the role of structured movement educational assessment activities, and to explore to what extent movement can support six-year-old preschool learners understand numeracy and literacy concepts. The experiences of the participants (class teacher, and HOD) overall assessment and the feasibility of the movement activities for preschool learners were explored through semi-structured interviews, observation notes, reflection sheets, a research journal and photographs. These forms of data were analysed, and themes were elicited based on thematic analysis. It appears that the structured movement educational assessment activities contributed positively to the understanding of numeracy and

literacy concepts in preschool learners. These will be discussed more in depth during the course of this chapter.

### **5.3 OVERVIEW OF THE FINDINGS OF THE STUDY**

The findings of the study indicate that first, when movement activities are integrated with numeracy and literacy concepts, they seem to contribute positively to preschool learners' overall development, specifically their social and cognitive development. Second, when preschool learners are physically involved in movement activities, they engage in tasks of listening, seeing, and doing, and practical application of concepts of numeracy and literacy. Third, the value of assessing the preschool learners qualitatively during practical activities seemed favourable, as underlying conceptual knowledge of numeracy and literacy difficulties, as well as poor motor skill acquisition, were identified during the structured movement activities; whereas often, they may go unnoticed in a typical classroom setting. Fourth, the idea of building social skills is stressed, where findings from this study bring forth that movement activities seem to positively impact on the group dynamics, e.g. preschool learners seemed to participate, by helping each other with visible team participation and group effort.

### **5.4 ADDRESSING THE RESEARCH QUESTIONS**

#### **5.4.1 PRIMARY RESEARCH QUESTION**

*To what extent can structured movement educational assessment activities be used to support six-year-old preschool learners to understand numeracy and literacy concepts?*

Preschool learners are intertwined in a complex process involving their developmental domains of cognitive and social spheres during these fundamentally important years. The results of the study indicate that structured movement educational assessment activities can make a positive contribution towards their understanding of numeracy and literacy concepts.

Firstly, the structured movement educational assessment activities included movement abilities (see section 2.3.2), which include skills of locomotion, manipulation, and stability identified as by Gallahue (1976) and Gallahue and Donnelly (2003), to offer an opportunity for preschool learners to be fundamentally involved in movement activities, whilst gaining knowledge in numeracy and literacy concepts.

It became evident that the learners, through active participation, i.e. by utilising fundamental movement skills, seemed to be understanding concepts of numeracy and literacy presented during the movement activities. This can be linked to a similar finding, where Erwin, Docheff and Beighle (2010), also view the integrating of physical activity into academic content as a valuable aspect of the school day for both learners' and teachers, because these authors found that movement activities provide benefits for learners. Findings from the study agree with the above, demonstrating the value of concrete aids, such as blocks, numbers on flash cards, cut out shapes of varying size and colour, cones, and hoops, utilised during the movement activities, which subsequently inform the learner's reasoning and understanding of numeracy concepts on an abstract level. Numeracy concepts such as big and small, types of colours, measurement, i.e. size, form, thick and thin, etc., were all included as academic content in the movement activities, which informed preschool learners' understanding in a visual way.

Similarly, concepts of literacy such as: i) instructions given during the structured movement educational assessment activities; ii) the questions formulated by the class teacher; iii) the responses from the preschool learners; iv) language of movement such as run, hop, jump, balance, etc.; and v) and positive reinforcing words of 'well done' 'yes you can do it', are, in effect, literacy concepts being heard by the learners during the activities, and being understood in an informal manner. These findings emerged from various scholars such as Humphrey and Wakeford (2008), Balat (2007), and Pellet and Pellet (2010), who agree that everyday activities and basic concepts and words which are introductory to literacy can be introduced through movement activities.

The above ties in with Carey (1978), who echoes that preschool learners quickly learn to say new words and understand what they mean, when a physical action or manipulation of an object accompanies the word, whilst Pica (2004) concurs that a developmentally appropriate movement curriculum can benefit preschool learners in the refinement of movement skills, while at the same time, expand their movement vocabularies. Furthermore, a study by Nair et al. (2014) revealed that the implementation of the play method can help to improve the mastery of vocabulary among preschool learners when compared with the conventional method. Similarly, this study identified that movement activities inform an understanding of words associated with a particular action of a movement skill. This study ensured that concepts of numeracy and literacy were included in the integrated movement activities for the duration of the study (during the course of the four days).

This view was echoed in Pellet and Pellet (2010:50), in a research article called 'Building Physical education Knowledge and Understanding Through Vocabulary Activities', which alleges that implementing vocabulary words in physical education on a regular basis can make a significant difference in building students' background knowledge and comprehension. These scholars further maintain that this type of integration can enhance reading, improve understanding of movement concepts, and develop movement quality. Kreichauf et al. (2012) also concur that accompanying physical activity lessons with language is not more time consuming, but is in fact just as effective. These scholars further state in their research paper that three studies within their paper confirm that reaching two curricular goals with one activity is possible.

Lastly, findings from the study emerge that during the structured movement educational assessment activities, both the teachers were able to identify the learners experiencing difficulty. Herewith the mistakes included:

- movement skill difficulty, specifically with fundamental movement abilities of locomotion, manipulation, and stability;
- perceptual motor skills of confusing laterality, spatial orientation, visual discrimination, as well as auditory discrimination; and
- mistakes encountered with counting out objects.

It was observed during the activities, that when a mistake was made by a learner; it was immediately rectified by the class teacher during the session, hence involving all the learners in a learning process. This in turn created an avenue for the class teacher to easily identify and assess the learners' level of understanding, because she was actively involved in the lesson.

Both the teachers (class teacher and HOD) motivated further for activities of this nature, as tools of assessment for preschool learners, for the reason that the mistakes (identified above) are almost never identified inside a classroom, from behind a desk. Similar to this finding, Black (1995) reports that a good physical education programme can boost academic achievement, and elaborates that, preschool learners learn more in a physical education activity than they do sitting still most of the day in the classroom, while Gallahue and Donnelly (2003) also accept that when cognitive concepts are demonstrated through the medium of movement, active participation reinforces fun, and that when preschool learners engage in activities that involve an academic concept, their attention is not as easily diverted as when they are involved in a less active classroom setting.



Researchers (Archibald & Martin, 2003; Ripley, 2001; Sugden & Chambers, 2003, 2007; Wright & Sugden, 1998) corroborate that activities for assessment for preschool learners with motor difficulties have been limited, and there have only been a small number of studies that have evaluated structured programmes for preschool learners' with motor difficulties in school. This is also corroborated by Orłowski, Lorson, Lyon and Minoughan (2013), who state that opportunities for physical activity are needed throughout the school day.

The extent to which structured movement educational assessment activities can be used to support six-year-old preschool learners to understand numeracy and literacy concepts seems to be favourable based on extensive research across many scholars in the field. In summary, the extent of movement activities integrated with numeracy and literacy concepts play a pivotal role in the lives of preschool learners' experience in a school setting. The above findings seem to align positively with previous literature, as well as with findings from the current qualitative study.

#### **5.4.2 SECONDARY RESEARCH QUESTIONS**

##### **5.4.2.1 Secondary research question 1**

*What is the role of structured movement educational assessment activities in supporting the numeracy and literacy concepts of six-year-old preschool learners?*

The most common aspect of the role of movement to inform understanding of numeracy and literacy concepts for the learners' was linked to the conceptual framework. Using concepts from the conceptual framework, I introduced movement assessment activities through active physical skills. The role of movement in particular, skills of locomotion, manipulation and stability, which align well with physical activities specifically with age appropriate gross-motor skills, as outlined in the conceptual framework. In addition, the conceptual framework also highlighted the role of movement skills in enhancing the perceptual motor development. Instructions related to spatial awareness, laterality, body awareness, and visual and auditory discrimination were included as part of the structured activities. These perceptual motor abilities contributed significantly to the learners understanding numeracy and literacy concepts (discussed in Chapter 4). The above will now be discussed more in-depth.

During the course of the study, the learners' activities included locomotor skills that involve moving the body through space (i.e. running, jumping and hopping), and

object control skills that entail using the hands and feet to manipulate and/or project objects (i.e. throwing, catching, kicking and rolling). These skills were included in the four-day sessions and served as a catalyst, where numeracy and literacy concepts seemed to be integrated into a holistic movement and understanding experience.

Robinson, (2010), states that children move and engage in physical activity through the execution of fundamental motor skills. Gallahue (1976) echoes that fundamental movement abilities involve attaining acceptable levels of performance in a variety of basic movement skills in early childhood. Gallahue, Ozmun and Goodway (2012, p.186) assert that children begin the development of fundamental movement skills when the journey into childhood begins. Through the natural process, fundamental movement skills are learnt very easily.

Perceptual development is best observed during active participation of integrating fundamental movement skills (FMS). The research showed that preschool learners were visually cognisant of the environment; listening to the teacher's instructions; were physically engaging in the activity by orientating their bodies spatially; were made aware of directionality; and were listening to the instructions for both themselves and their peers. These findings fall in line with literature that identifies perceptual development as the developing ability to interpret information received via the senses. Louw (1991) and Gallahue and Donnelly (2003) agree that perceptual motor development is the establishment and refinement of sensory sensitivity to one's world through movement, thus enhancing preschool learners' knowledge of their spatial world through movement activities, which play a vital role to their body, space and directional awareness. The above findings also collaborate with Krog and Kruger (2011), who advocate that a movement activity should include the following systems: vestibular (balance system—the main instructor of the sensory system); proprioceptive (body in space); tactile (touch); visual (sight); and auditory (sound) systems.

Similar to the findings from the current study, a study conducted by Pang and Fong (2009) investigated the fundamental motor skill proficiency of Hong Kong learners aged between six and nine. These scholars stated that fundamental motor skills also can enhance learners' interpersonal, cognitive, and emotional development and that fundamental motor skills must be taught, refined and combined with other movement skills in a variety of physical activities, because they are not acquired simply through activities of various sorts.

Upon reflection of the findings, it became clear that movement experiences can also build social skills amongst preschool learners. Gallahue et al. (2012, p.36) describes this stage when initiative is established during the early childhood years, where children are challenged to engage in more purposeful and responsible socialised behaviours. Theme 2 (in Chapter 4) identifies that structured movement educational assessment activities create a positive space for preschool learners, whereby they seem to have a pleasurable and fun experience.

Findings from this study highlight that the role of movement experiences during the activities, brought forth amongst preschool learners', namely: group participation, teamwork, positive reinforcement, cheering and motivating each other, subsequently added value to the process of understanding academic concepts. Furthermore, according to the teachers, the structured movement activities created a platform where healthy competition amongst the learners contributed to their striving to want to understand numeracy and literacy concepts. By mobilising structured movement activities, the preschool learners built social skills, and seemed to share a common goal to achieve a task (movement skill; and/or numeracy; and/or literacy concept) in a group effort.

These social tools served as catalysts to inform the preschool learners' social skills, and linked positively to the movement experiences, which subsequently enhanced their social development. Similar findings from Umek, Kranjc, Fekonja, and Bajc, (2008) assert that children's language, cognitive, and social development levels are connected with their academic success when they enter the school environment, while Johnson and Johnson's (1999) theory of cooperation, advocates working together to accomplish shared goals were all identified during the course of the four days.

The role of movement also ties in with Draper et al. (2012), who corroborate that participation in such activities can serve to enhance the social skills of participants and increase their levels of self-efficacy regarding motor skills, as identified in the findings of this study. Findings from this study demonstrated that the learners gained confidence when they began to master a movement skill, which concurrently created social acceptance amongst each other.

The above findings can be linked to those of Humpries, Bidner and Edwards (2011), who concur that a learners' learning experience exhibits responsible personal and social behaviour that respects self and others in physical activity settings. They

further state that physical activities are beneficial, as they value aspects of health, enjoyment, challenge, self-expression, and/or social interaction.

#### **5.4.2.2 Secondary research question 2**

*How does movement as a medium in a structured movement educational assessment activity support preschool learners aged 6 years understand numeracy and literacy concepts?*

Based on the findings of the study, it seems clear that fundamental movement skills (FMS) contributed to the learners understanding of numeracy and literacy concepts, and potentially provided a repertoire of movement experiences, permitting the learners to refine that skill which benefitted them in building on the skills of being physically fit. These findings were also similar to that of researchers who concur that physical activity has been associated with cardiovascular health and fitness, muscular strength and endurance, and a positive association with academic achievement (Strong et al., 2005).

It appears across the literature review that preschool learners have an innate need to move. Most of their physical development takes place during the period of three to six years of age, where they begin to master the ability to control their bodies. For this reason, continuous practice and instruction of skills of movement can serve as a means to refine a task, and for movement skills to be perfected. Similarly findings during the course of the four consecutive days of activities, preschool learners' performance level and movement repertoire improved (as discussed in Chapter 4). In line with these findings, the teachers' response seems to be favourable, where movement as a medium, when repeated, supports preschool learners in understanding numeracy and literacy concepts, when integrated into one lesson plan.

During the course of the four days, the teachers also viewed the activities through the lens of 'play' as a medium where learners were listening, seeing, and doing. Play is a broad term, but when used in a structured format where each activity had a goal, a purpose, a concept to be identified, and a movement skill to be mastered through repertoire; movement as a medium, when integrated with concepts of numeracy and literacy, played a positive role for learners to understand academic concepts.

Another finding in this study was the stimulating environment with colours and age-appropriate apparatus utilised during the structured movement educational assessment activities. The stimulating environment appealed to the learners'

cognition in a positive manner, whereby the learners showed curiosity and interest in the activities. They wanted to be involved in the activities, which in turn expanded into incidental understanding of numeracy and literacy concepts.

The above findings confirm that the activities were seen as more meaningful, and created a fun atmosphere for both the preschool learners and the class teacher involved. These findings are reinforced by Gagen and Getchell (2006), who confirm that when teachers choose movement activities, motor development theory must be understood and utilised in the planning of activities so as to ensure that the choice of the movement task, equipment, and the movement environment interact to encourage developmentally appropriate movement experiences. Further to this, Gagen and Getchell (2006), also add that, in choosing developmentally appropriate activities, and in selecting appropriate equipment with which to perform these activities, many learners will absorb a love of activity, and will become capable enough in movement to encourage them to be lifelong movers, practicing healthy lifestyle choices. These scholars further assert that the learners involved in the activities can certainly have fun and learn basic motor skills at the same time.

Both the class teacher and the HOD echo that structured movement educational assessment activities creates enthusiasm amongst the preschool learners, and extends understanding for the acquisition of numeracy and literacy concepts when assimilated with plenty of space, different colours of the apparatus, and a visually appealing setup. In addition to this, the adaptability of the activities, whereby the class teacher may possibly improvise the activities and instructions to her discretion during the course of the four days, was identified as constructive to the implementation of the activities.

It can be assumed that movement experiences also prepare preschool learners' for school and for life by building their confidence and social skills through movement repertoire and group participation. The learners benefit from moving together, as this motivated them to persevere and challenge their peers, with a view to support group participation. Movement as a medium in a structured movement educational assessment activity created a social platform, where the learners seemed to engage with one another.

It would seem that existing literature, together with the conclusions from this study, seem to give a positive indication that movement can be seen as a catalyst to

promoting the understanding of numeracy and literacy concepts, through the medium of structured activities.

## **5.5 OVERVIEW OF THE CENTRAL ASPECTS OF THIS STUDY**

The importance of movement skills being integrated into understanding the concepts of numeracy and literacy, play a vital role in the development of a preschool learner. It is safe to assume that if a preschool learner experiences difficulty in one sphere of the assessment, such as a movement skill, it can filter across the preschool learners' cognitive domain of development. These findings are also made evident by Skinner and Piek (2001), who substantiate that poor motor skills may lead to poor performance in physical activities, which may reduce a learner's sense of competence, and which may in turn lead to withdrawal from movement activities that may lead to limited opportunities to practice motor skills, and to participate socially.

The importance of structured movement educational assessment activities during the course of analysis appear to permit assessing preschool learners' experiencing difficulty in an informal manner seem to be favourable. It was evident that the class teacher was able to assess the preschool learners during these activities in more than one way: firstly, by allowing the preschool learners to practice movement skill, thus enforcing a movement repertoire; secondly, by assessing for knowledge-based difficulty, where a specific concept during a particular activity was explained again, or repeated by a peer, so as to enforce the same concept being understood across all preschool learners; thirdly, instructions were repeated to inform an understanding of what was expected of that learner; and lastly, the idea of working collaboratively in a group setting seemed to also serve as a positive link, as the group and teacher supported the learner so as to maximize a full understanding experience. Similar findings are discussed by Peter and Walter (2010), who reiterate that the importance for preschool learners to receive feedback, directions and encouragement from teachers and peers when it relates to their motor skills, and transforms their experience through playful activity, a natural way that preschool learners can understand.

The value of structured movement educational assessment activities seemed favourable when employing the components of the conceptual framework in Figure 2.1, when integrating the cognitive, social and physical development of the preschool learner in a fun and creative way. The research questions discussed also confirm that movement plays a significantly important role in the holistic development of a

learner. Further to this, Gallahue, Ozmun and Goodway (2012) explain that the activities must be planned so as to also enhance the perceptual motor functioning of children, and should include ample opportunities to elevate a positive reinforcement, which in turn will construct a healthy sense of self and reduce the fear of failure. In line with the above, I identified and employed in the conceptual framework, with a view to add value to a preschool learners experience in a typical school setting.

## **5.6 LIMITATIONS OF THE STUDY**

A first limitation to this study is the use of a qualitative research design. Qualitative designs always raise the question of the researcher's objectivity in the study, and therefore, the subjectivity and context specificity of the findings. The aim of this research study embraced the true nature and subjective experiences of all the participants included in the study.

A second limitation was that the small number of participants limits the generalisability of the results. This study was conducted on a small group of Muslim participants from a predominately Muslim school based in Pretoria, implying that the results should not be generalised without caution. However, as a case study design was followed, it may be possible to make context-bound generalisations to others in a similar position. The small scale of the study also resulted in a sample not representative of the broader South African society, therefore the impact of socio-economic status and culture has not been taken into account. Furthermore, the use of purposeful sampling restricted the sample to a very small and somewhat homogenous group. The time limit for the current study was not conducive enough to allow for the design of the study as an intervention, which would have provided more clarity on the benefit/lack of benefit of the impact of movement educational assessment activities on learners. This generates opportunities for further research.

## **5.7 CONTRIBUTION OF THE STUDY**

The current study provides some evidence that structured movement educational assessment activities can be utilised as a means of supporting preschool learners understanding of numeracy and literacy concepts, through the medium of movement. It also supports teachers in assessing preschool learners through the medium of movement, by gaining a better understanding of the assessment of the type of difficulty they experience.

The study contributes to the knowledge base in the field of educational psychology. Furthermore, the case study design allowed for an in-depth investigation into the experiences of preschool learners' taking part in structured movement educational assessment activities. This detailed view of the experiences of the participants (preschool learners', class teacher, and HOD) may be seen as a contribution in itself, as similar existing literature tends to be based on quantitative data collection techniques. The nature of the study allows for a better understanding of the nature of the experiences of preschool learners during the activities, perceptions and feelings of participants who engage in the structured movement educational assessment activities.

The study also offers insights for teachers more broadly that specialise with preschool learners' in ways in which movement experiences can inform understanding of numeracy and literacy concepts. The study demonstrates positive results, where the participants (preschool learners') were observed qualitatively, which allowed data to be captured instantaneously. Further to this, the adaptable activities allowed the class teacher to improvise the instructions whilst assessing the learners.

## **5.8 RECOMMENDATIONS**

### **5.8.1 FURTHER RESEARCH**

The study offers a preliminary view of the phenomenon of introducing structured movement educational assessment activities in the South African context. Further research is recommended in order to deepen the understanding of the effects of structured movement educational assessment activities on preschool learners' learning and development. Further research could include:

- ❖ a larger study of the experiences of South African preschool learners' who engage in structured movement educational assessment activities, with a sample that is more representative of South African society;
- ❖ a comparative study contrasting the experiences of preschool learners in a structured movement educational assessment activity and of preschool learners who did not experience the activities;
- ❖ a longitudinal study focusing on the preschool learners before, during and after being part of the structured movement educational assessment activities; and/or



- ❖ a comparative study of preschool learners understanding of numeracy and literacy concepts who have been part of the structured movement educational assessment activities as opposed to those who have not been included.

## 5.9 CONCLUSION

Structured movement educational assessment activities can be utilised to enhance preschool learners' movement experiences and understanding in early childhood education. This is a growing phenomenon that is quickly becoming a part of many research studies. However due to the time required for implementing such activities, movement activities are not included as part of the curriculum within a school setting, despite extensive research that supports and promotes the idea of such activities being integrated into a school setting. This study aimed to address only one aspect of this very complex phenomenon, namely, whether movement can support understanding and assessment of numeracy and literacy concepts. Although the structured movement educational assessment activities can be seen as a valuable form of preschool learners' optimal development, it appears that *the true value of movement is essential to understanding and can be regarded as the door to develop an integrated approach to facilitating understanding in academic concepts.*

The results of this exploratory study suggest that further research is warranted to confirm the strong possibility that carefully designed, developmental movement activities for preschool learners can make a difference to those preschool learners who were assessed prior to the current study. This implies that teachers should consider the value of such activities in the school curriculum. The possibility exists that other biases, as within a qualitative design, may have influenced the findings of this study, further research opportunities bringing in psychometric tools within a qualitative design, may control such influences.

---ooOoo---

## LIST OF REFERENCES

---

---

- Altrichter, H., Posch, P., & Somekh, B. (1993). *Teachers investigate their work. An introduction to the methods of action research*. London: Routledge.
- Archibald, M., & Martin, C. (2003). Jump ahead. *Special Children* (November/December), 18-20.
- Ayres, J. (1979). *Sensory integration and the child*. Los Angeles, CA: Western Psychological Services.
- Babbie, E. R. (2013). *The practice of social research* (13<sup>th</sup> ed.). Cape Town: Oxford Press
- Babbie, E., & Mouton, J. (2001). *The practice of social research*. Cape Town: Oxford University Press.
- Babbie, E., Mouton, J., Vorster, P., & Prozesky, B. (2002). *The practice of social research*. Cape Town: Oxford University Press Southern Africa.
- Balat, U. G. (2009). Examining the knowledge of basic concepts of learners starting primary education. *Early Child Development and Care*, 179(7), 911-918.
- Black, S. (1995). Just do it. *Executive Educator*, 17(4), 33-36.
- Blake, B., & Pope, T. (2008). Developmental Psychology: Incorporating Piaget's and Vygotsky's theories in classrooms. *Journal of Cross-Disciplinary Perspectives in Education*, 1(1), 59-67.
- Blanche, T.M., & Durrheim, K. (2002). *Research in practice: Applied methods for the social sciences*, Cape Town: UCT Press.
- Blaydes-Madigan, J. (2004). *Thinking on your feet* (2<sup>nd</sup> ed.). Murphy, TX: Action Based Learning.
- Bless, C., & Higson-Smith, C. (1995). *Fundamentals of Social Research Methods-An African Perspective* (2<sup>nd</sup> ed.). Cape Town: Juta, & Co.

- Bless, C., & Higson-Smith, C. (2004). *Fundamentals of Social Research Methods-An African Perspective*. Cape Town: Juta, & Co.
- Bluestone, J. (2004). *HANDLE. Intervention in the holistic approach to neuro-development and learning efficiency* (2<sup>nd</sup> exp. ed.). Seattle, WA: HANDLE Institute.
- Bond, C., Cole, M., Fletcher, J., Noble, J., & Connell, M. O. (2011). Developing, & sustaining provision for children with motor skills difficulties in schools: the role of Educational Psychologists. *Educational Psychology in Practice: Theory, Research and Practice in Educational Psychology*, 27(4), 337-351.
- Boreham, C., & Riddoch, C. (2001). The physical activity, fitness and health of children. *Journal of Sports Sciences*, 19, 915-929.
- Brown, G. T. L., Kennedy, K. J., Fok, P. K., Chan, J. K. S., & Yu, W. M. (2009). Assessment for students; improvement: understanding Hong Kong teachers' conceptions and practices of assessment. *Assessment in Education: Principles, Policy and Practice*, 16(3), 347-363.
- Campbell, S. B. (2006). *Behavior problems in preschool children. Clinical and development issues*. London: Guilford Press.
- Carey, S. (1978). The child as a world learner. In M. Halle, J. Bresnan, & G. A. Miller (Eds.), *Linguistic theory and psychological reality* (pp. 264-293). Cambridge, MA: MIT Press.
- Clark, J. E. (1994). Motor development. *Encyclopedia of Human Behaviour*, 3, 245-255.
- Cohen, L., Manion, L., & Morrison, K. (2003). *Research methods in education* (5<sup>th</sup> ed.). Routledge Falmer.
- Cohen, L., Manion, L., & Morrison, K. (2004). *Research methods in education* (5<sup>th</sup> ed.). London: Routledge Falmer.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6<sup>th</sup> ed.). New York: Routledge.
- Cohen, L., Manion, L., & Morrison, K. (2010). *Research methods in education* (6<sup>th</sup> ed.). London: British Library.

- Cools, W. Martelaer, K.D., Samaey, C., & Andries, C. (2008). Movement skill assessment of typically developing preschool children: A review of seven movement skill assessment tools. *Journal of Sports Science, & Medicine*, 8, 154-168.
- Copple, C., & Bredekamp, S. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8*. Washington, DC: NAEYC.
- Corso, M. (1993). Is developmentally appropriate physical education the answer to children's school readiness? *Journal of Health, Physical Education, Recreation and Dance*, 19(2) 6-7.
- Council for Counsellors' in South Africa code of ethics (2009). [Online] Available at: <http://www.chatitout.co.za/council-for-counsellors>. (Accessed 15 September 2009).
- Cragg, S., & Cameron, C. (2006). *Physical activity of Canadian youth – An analysis of 2002 health behaviour in school-aged children data*. Ottawa, Ontario: Canadian Fitness and Lifestyle Research Institute.
- Cratty, B. J. (1972). *Physical expressions of intelligence*. Englewood Cliffs, NJ: Prentice-Hall.
- Cratty, B. J. (1973). *Movement, behaviour and motor learning*. London: Henry Kimpton.
- Creswell, J. (1998). *Qualitative Inquiry and research design*. London: Sage Publications.
- Creswell, J. W. (2005). *Educational research: Planning, conducting, and evaluating qualitative and quantitative research* (3<sup>rd</sup> ed.). New Jersey: Pearson Education International.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2<sup>nd</sup> ed.). London: SAGE.
- Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.

- Delacato, C. H. (1959). *Treatment and prevention of reading problems: The neuro-psychological approach*. Springfield, IL: Charles C. Thomas.
- Delacato, C. H. (1974). *The diagnosis and treatment of speech and reading problems*. Springfield, IL: Charles C. Thomas.
- De Witt, M. W. & Booyesen, M. I. (1995). *Focusing on the small child: Insights from Psychology of Education*. Hatfield: Acacia.
- Denzin, N. K., & Lincoln, Y. S. (2011). *The Sage handbook of qualitative research* (3<sup>rd</sup> ed.). London: SAGE.
- DiFabio, A., & Maree, J. G. (2012). Ensuring quality criteria in scholarly writing. In: J. G. Maree (Ed.), *Completing your thesis or dissertation successfully: Practical guidelines* (pp. 136-144). Cape Town: Juta.
- Dotterweich, A. R., Greene, A., & Blosser, D. (2012). Using innovative playgrounds, & cross curricular design to increase physical activity. *Journal of Physical Education, Recreation and Dance*, 83(5), 47-51.
- Draper, C. E., Achmat, M., Forbes, J., & Lambert, V. (2012). Impact of a community-based programme for motor development on gross motor skills and cognitive function in preschool learners from disadvantaged settings. *Early Learner Development and Care*, 182(1), 137-152.
- Elena, S., Georgetaa, N., Cecilab, G., & Lupuc, E. (2014). 4th World Conference on Psychology, Counselling and Guidance WCPCG-2013. Perceptual-motor development of children in elementary school. *Procedia – Social and Behavioral Sciences*, 114, 632-636.
- Eliason, C. F., & Jenkins, L. T. (1986). *A practical guide to early childhood curriculum*. Columbus, OH: Merrill.
- Elliot, R. (1998). The use of dance in child psychiatry. *Clinical Learner Psychology and Psychiatry*, 3(2), 251-265.
- Erikson, E. H. (1963). *Childhood and society* (2<sup>nd</sup> ed). New York: Norton.
- Erikson, E. H. (1977). *Childhood and society*. New York: Norton.
- Erwin, H. E., Docheff, D., & Beighle, A. (2010). Get kids moving in the classroom. *Journal of Physical Education, Recreation and Dance*, 81, 15-17.

- Flick, U. (2002). *Qualitative research in psychology: A textbook*. London: Sage.
- Flick, U. (2009). *An introduction to qualitative research* (4<sup>th</sup> ed.). London: Sage.
- Flinchum, B. (1975). *Motor development in early childhood: A guide for movement education with ages 2 to 6*. St. Louis Missouri: C.V. Mosby Company.
- Fouché, C. B. (2005). Problem formulation. In: A. S. de Vos (Ed.), *Research at grassroots for the Social Sciences and Human Sciences Professions* (3<sup>rd</sup> ed.). (pp.104-113). Pretoria: Van Schaik Publishers.
- Fouka, G., & Mantzorou, M. (2011). What are the major ethical issues in conducting research? Is there a conflict between the research ethics and the nature of nursing? *Health Science Journal*, 5(1), 3-14.
- Fredericks, C. R., Kokok, S. J., & Krog, S. (2006). Using a developmental movement programme to enhance academic skills in Grade 1 learners. *South African Journal for Research in Sport, Physical education, & Recreation*, 28(1), 29-42.
- Gabbard, C. (1998). Windows of opportunity for early brain and motor development. *The Journal of Physical Education, Recreation & Dance*, 69(8), 54.
- Gagen, L., & Getchell, N. (2006). Using 'constraints' to design developmentally appropriate. *Movement Activities for Early Childhood Education Early Childhood Education Journal*, 34(3).
- Gallahue, D. (1993). *Developmental physical education for today's children* (chapter 27). Dubuque, Wm.: C. Brown Communications Inc.
- Gallahue, D. L. (1976). *Motor development and movement experiences for young children*. New York: John Wiley & Sons Inc.
- Gallahue, D. L. (1982). *Understanding motor development in children*. Boston, MA: John Wiley & Sons Inc.
- Gallahue, D. L. (1996). *Developmental physical education for today's children*. Guilford, CT: Brown & Benchmark.
- Gallahue, D. L., & Donnelly, F. C. (2003). *Developmental physical education for all children* (4<sup>th</sup> ed.). China: Human Kinetics.

- Gallahue, D., Ozmun, J. C., & Goodway, J. D. (2012). *Understanding motor development: infants, children, adolescents, adults* (7<sup>th</sup> ed.). New York: McGraw-Hill Companies Inc.
- Garcia, C., Koch, B., Kretchmann-Kandel, E., Falkowski, G., Christ, H., & Coburger, H. (2004). Correlation between BMI, leisure, habits and motor abilities in childhood. (CHILT-Project). *International Journal of Obesity*, 28, 22-26.
- Gehris, J., Gooze, R., & Whitaker, R. (2014). Teachers' perceptions about children's movement and learning in early child education programmes. *Child: Care, Health and Development*. doi:10.1111/cch.12136
- Gesell, A. (1940). *The first five years of life: a guide to the study of the preschool child*. New York: Harper.
- Giagazoglou, P., Karagianni, O., Sidiropoulou, M., & Salonikidis, K. (2008). Effects of the characteristics of two different preschool-type setting on childrens' gross motor development. *European Psychomotricity Journal*, 1(2), 54-60.
- Gibson, W., & Brown, A. (2009). *Working with qualitative data*. London: Sage.
- Gmitrova, V., & Gmitrov, J. (2003). The impact of teacher-directed and learner-directed pretend play on cognitive competence in kindergarten children. *Early Childhood Education Journal*, 30(4) 241-246.
- Goddard Blythe, S. A. (2000). Early learning in balance – Priming the first ABC. *Support for Learning*, 15(4), 154-158.
- Golubovic, Š., Milutinovic, D., & Golubovic, B. (2013). Benefits of physical exercises in developing certain fitness levels in children with hyperactivity. *Journal of Psychiatric and Mental Health Nursing: A Primer for the Caring Professions*. doi: 10.1111/jpm.12091.
- Goodway, J. D., & Branta, C. F. (2003). Influence of a motor skill intervention on fundamental motor skill development of disadvantaged preschool children. *Research Quarterly for Exercise and Sport*, 74(1), 36-46.
- Greeff, M. (2005). Information collection: Interviewing. In A. S. De Vos, H. Strydom, C. B. Fouché, & C. S. L. Delpont (Eds.), *Research at grass roots – for the Social sciences and human services professions* (3<sup>rd</sup> ed.). Pretoria: Van Schaik.

- Hanneford, C. (1995). *Smart moves: Why learning is not all in your head*. Arlington, VA: Great Ocean.
- Hartley, J. (2004). *Essential guide to qualitative methods in organisational research*. London: SAGE.
- Hayes, N. (2011). *Doing psychological research*. New York: Open University Press.
- Haywood, K. M., & Getchell, N. (2005). *Life span motor development* (4<sup>th</sup> ed.). Human Kinetics, Champaign, IL, USA.
- Hedley, A. A., Ogden, C. L., Johnson, C. L., Carroll, M. D., Curtin, L. R., & Flegal, K. M. (2004). Prevalence of overweight and obesity among US children, adolescents and adults, 1999-2002. *Journal of the American Medical Association*, 291, 2847-2850.
- Henning, E., Van Rensburg, W., & Smith, B. (2004). *Finding your way in qualitative research*. Pretoria: Van Schaik Publishers.
- Hill, C. E., Knox, S., Thompson, B. J., Williams, E. N., Hess, S. A., & Ladany, N. (2005). Consensual qualitative research: An update. *Journal of Counselling Psychology*, 52, 196-205.
- Humphrey, R., & Wakeford, L. (2008). Development of everyday activities: A model for occupation-centered therapy. *Infants and Young Children*, 21(3), 230-240.
- Humphries, C. A., Bidner, S., & Edwards, C. (2011). Integrated learning with physical education and music. The clearing house: *A Journal of Educational Strategies, Issues and Ideas*, 84(5), 174-179.
- Hutt, S., Tyler, S., Hutt, C., & Christopherson, H. (1989). *Play, exploration, and learning: A natural history of the pre-school*. London: Routledge.
- Ibrahim, A. M. (2012). *Thematic Analysis: A critical review of its process and evaluation*. Academic Conference Proceedings (pp. 8-21). WEI International European, Zagreb, Croatia.
- Janesick, V. (2003). The choreography of qualitative research designs: minuets, improvisations, and crystallizations. In D. Denzin, & Y. Lincoln (Eds.), *Strategies of qualitative enquiry* (pp. 46-79). California: Sage Publications.



- Janz, K. F., Letuchy, E. M., Eichenberger Gilmore, J. M., Burns, T. L., Torner, J. C., Willing, M. C., & Levy, S. M. (2010). Early physical activity provides sustained bone health later in childhood. *Medicine and Science in Sports and Exercise*, 42(6), 1072-1078.
- Johnson, D. W., & Johnson, R. T. (1999). *Learning together and alone*. Needham Heights, MA: Allyn and Bacon.
- Johnson, R. B., & Christensen, L. B. (2011). *Educational research: Quantitative, qualitative and mixed approaches* (4<sup>th</sup> ed.). USA: Sage Publications.
- Karabulut, H. (2013). The neuro-building blocks of learning: Improving school readiness and overcoming learning difficulties. *Journal of Education and Future*, 4(1), 15.
- Kephart, N. C. (1975). *The slow learner in the classroom*. Columbus, OH: Merrill.
- Kirk, S. M., Vizcarra, C. R., Looney, E. C., & Kirk, E. P. (2014). Using physical activity to teach academic content: A study of the effects on literacy in head start. *Preschoolers Early Childhood Education Journal*, 42, 181-189.
- Kozub, F. M. (2012). Teaching About Pathways Using Academic Learning Concepts. *Journal of Health, Physical Education, Recreation and Dance*, 83(2), 10-12.
- Kreichauf, S., Wildgruber, A., Krombholz, H., Gibson, E. L., Vogele, C., Nixon, C. A., Douthwaite, W., Moore, H. J., Manio, Y., & Summerbell, C. D. (2012). Critical narrative review to identify educational strategies promoting physical activity in preschool. *Obesity Reviews*, 13(1), 96-105.
- Krog, S., & Kruger, D. (2011). Movement programmes as a means to learning readiness. *South African Journal for Research in Sport, Physical Education & Recreation*, 33(3), 73-87.
- Leedy, P. D., & Ormrod, J. E. (2001). *Practical research: Planning and design* (7<sup>th</sup> ed.). USA: Prentice-Hall, Inc.
- Lemos, A. G., Avigo, E. L., & Barela, J. A. (2012). Physical education in kindergarten promotes fundamental motor skill development. *Advances in Physical Education*, 2(1), 17-21.
- Louw, D. A. (1991). *Human Development*. Bloemfontein: HAUM Building.

- Mahar, M. T., Murphy, S. K., Rowe, D. A., Golden, J., Shiels, A. T., & Raedeke, T. D. (2006). Effects of a classroom-based program on physical activity and on task behaviour. *Medical, & Science in Sports & Exercise*, 38, 2086-2094.
- Maier, H. W. (1969). *Three theories of child development*. New York: Harper & Row.
- Manning, M, S., & Mitchell, C. H. (2010). The role of action research in fostering culturally-responsive practices in a preschool classroom. *Early Childhood Education Journal*, 37, 269-277.
- Maree, K. (2010). *First steps in research*. Pretoria: Van Schaik.
- Maree, K., & Van der Westhuizen, C. (2010). Planning a research proposal. In K. Maree (Ed.). *First steps in research* (pp. 24-25). Pretoria: Van Schaik.
- Maree, K., Ebersöhn, L., & Vermaak, B. (2008). Confronting the effects of unemployment motivation: The case for post modern career facilitation. *Perspectives in Education*, 26(3), 56-63.
- McMillan, J. H., & Schumacher, S. (2010). *Research in Education – Evidence-based inquiry* (7<sup>th</sup> ed.). Upper Saddle River, New Jersey: Pearson Education.
- Melanie, P., & Ofra, W. (2010). Developing movement as inclusive pedagogy. *SFL: Movement and Pedagogy*, 1438, 38-46.
- Mensah, F., & Somuah, B. A. (2014). Rapprochement between Piagetian and Vygotskian Theories: Application to instruction. *Academic Journal of Interdisciplinary Studies*, 3(1).
- Merriam, S. B (Ed.). (2002). *Qualitative research in practice. Examples for discussion and analysis*. San Francisco: John Wiley & Sons..
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco: John Wiley & Sons.
- Merriam, S. B., & Simpson, E. (2000). *A guide to research for educators and trainers of adults* (2<sup>nd</sup> ed.). Malabar, FL: Krieger Publishing Company.

- Mertens, D. M. (2010). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative and mixed methods* (3<sup>rd</sup> ed.). California: Sage.
- Morrison, G. S. (2004). *Early childhood education today*. New Jersey: Upper Saddle River.
- Morrow, S. (2005). Quality and trustworthiness in qualitative research in counselling psychology. *Journal of Counselling Psychology*, 52(2), 250-260.
- Mouton, J. (2001). *How to succeed in your master's and doctoral studies: A South African guide and resource book*. Pretoria: J.L. van Schaik.
- Nair, S. M., Yusof, N. M., & Arumugam, L. (2014). The effects of using the play method to enhance the mastery of vocabulary among preschool children. *Procedia – Social and Behavioral Sciences*, 116, 3976-3982.
- Nieuwenhuis, J. (2010). Qualitative research designs and data gathering techniques. In K. Maree (Ed.). *First steps in Research* (pp. 69-97). Pretoria: Van Schaik.
- Orlowski, M., Lorson, K., Lyon, A., & Minoughan, S. (2013). A tool for integrating movement into the classroom. *Journal of Health, Physical Education, Recreation and Dance*, 84(9), 1072-1078.
- Palmer, K. K., Matsuyama, A. L., & Robinson, L. E. (2016). Impact of structured movement time on preschoolers' physical activity engagement. *Early Childhood Education Journal*. doi 10.1007/s10643-016-0778-x.
- Pang, A., W., & Fong, D., T.(2009). Fundamental motor skill proficiency of Hong Kong children aged 6-9 years. *Research in Sports Medicine: An International Journal*, 17(3).
- Pangrazi, R. P., & Dauer, V. P. (1981). *Movement in early childhood and primary education*. Minnesota: Burgess Publishing Company.
- Parker, W., Dalrymple, L., & Durden, E. (2000). *Communicating beyond AIDS awareness: A Manual for South Africa*. Auckland Park: Department of Health South Africa
- Park, M., Solomon, M., & Lee, A. (2007). Understanding classroom teachers' perceptions of integrating physical activity: A collective efficacy perspective. *Journal of Research in Childhood Education*, 21(3).

- Pate, P. R., Dowda, M., Brown, W. H., Mitchell, J., & Addy, C. (2013). Physical activity in preschool children with the transition to outdoors. *Journal of Physical Activity and Health, 10*, 170-175.
- Pate, R. R., Pfeiffer, K. A., Trost, S. G., Ziegler, P., & Dowda, M. (2004). Physical activity among children attending preschools. *Pediatrics, 114*(5), 1258-1263.
- Patterson, C. (2009). *Infancy and childhood*. Boston: McGraw-Hill Education.
- Patton, M. Q. (2002). *Qualitative research and evaluation* (3<sup>rd</sup> ed.). Thousand Oaks, CA: Sage.
- Pellet, H. H., & Pellet, T. L. (2010). Building physical education knowledge and understanding through vocabulary activities. *Journal of Health, Physical Education, Recreation and Dance, 81*(6), 49-51.
- Peter, M., & Walter, O. (2010). Developing Movement as inclusive pedagogy. *Support for Learning, 25*(1).
- Pheloung, B. (1997). *Help your class to learn: Effective perceptual movement programs for your classroom*. Sydney, Australia: Griffiths Press.
- Piaget, J. (1941/1952). *The learner's conception of number*. London: Routledge & Kegan Paul.
- Piaget, J. (1952). *The origins of intelligence in children*. New York, NY: International Universities Press.
- Piaget, J. (1971). *The psychology of intelligence*. London: Routledge & Kegan Paul.
- Piaget, J., & Inhelder, B. (1969). *The psychology of the child*. London: Routledge & Kegan Paul.
- Pica, R. (2004). *Experiences in movement: Birth to age 8*. Australia: Thomson, Delmar Learning.
- Pienaar, A. E. (2009). Kinderkinetics: An investment in the total well-being of children. *South African Journal for Research in Sport, Physical Education and Recreation, 31*(1), 49-67.
- Rabie, F. (2004). Focus group interview and data analysis. *Proceedings of Nutrition Society, 63*, 655-660.

- Rasberry, C. N., Lee, S. M., Robin, L., Laris, B. A., Russell, L. A., Coyle, K. K., et al. (2011). The association between school based physical activity, including physical education, and academic performance: A systematic review of the literature. *Preventive Medicine*, *52*, 10-20.
- Rathus, S.A. (2006). *Childhood voyages in development* (2<sup>nd</sup> ed.). New York: Thomson Wadsworth.
- Ripley, K. (2001). *Inclusion for children with dyspraxia/DCD: A handbook for teachers*. London: David Fulton Publishers.
- Robinson, L. E. (2010). The relationship between perceived physical competence and fundamental motor skills in preschool children. *Child: Care, Health and Development*, *37*(4), 589-596. doi:10.1111/j.1365-2214.2010.01187.x
- Robinson, L. E., & Goodway, J. D. (2009). Instructional climates in preschool children who are at-risk. Part I: object control skill development. *Research Quarterly for Exercise and Sport*, *80*, 533-542.
- Robinson, L. E., & Wadsworth, D. D. (2010). Stepping toward physical activity requirements: Integrating pedometers into early childhood settings. *Early Childhood Education Journal*, *38*(2), 95-102.
- Robinson, L. E., Stodden, D. F., Barnett, L. M., Lopes, V. P., Logan, S. W., Rodrigues, L. P., & D'Hondt, E. (2015). Motor competence and its effect on positive developmental trajectories of health. *Sports Medicine*, *45*(9), 1273-1284.
- Robinson, M. (2008). *Child development from birth to eight*. New York: Open University Press.
- Robson, C. (2005). *Real world research* (2<sup>nd</sup> ed.). United Kingdom: Blackwell Publishing.
- Rogoff, B. (2003). *The cultural nature of human development*. New York: Oxford University Press.
- Rule, P., & John, V. (2011). *Your guide to case study research* (p.189-201). South Africa: Van Schaik Publishers. San Francisco: Jossey-Bass.

- Ryen, A. (2004). Part 3 Field Relations: Ethical Issues. In C. Seale, G. Gobo, J. Gubrium, & D. Silverman (Eds.), *Qualitative research practice* (pp. 15-33). California: Sage Publications.
- Santrock. J. W. (2008). *A topical approach to life-span development* (4th ed.). New York City: McGraw-Hill.
- Schwandt, T. A. (2000). Three epistemological stances for qualitative inquiry: Interpretivism, Hermeneutics, and Social Constructionism. In: N. K. Denzin, & Y.S. Lincoln (Eds.), *Handbook of qualitative research*. Thousand Oaks, CA: Sage Publications.
- Sherborne, V. (1990). *Developmental movement for children*. Cambridge: Cambridge University Press.
- Shim, A.L., Norman, S. P., & Kim, Y. A. (2013). Teaching balance training to improve stability and cognition for children. *Journal of Physical Education, Recreation and Dance*, 84(8), 15-17.
- Sinkovics, R., Penz, E., & Ghauri, P. (2008). Enhancing the trustworthiness of qualitative research in international business. *Management International Review*, 48(6), 89-714.
- Skinner, R. A., & Piek, J. P. (2001). Psychosocial implications of poor motor coordination in children and adolescents. *Human Movement Science*, 20, 73-94.
- Slavin, R. E. (2007). *Educational research in an age of accountability*. Boston: Pearson.
- Smidt, S. (2006). *The developing child in the 21<sup>st</sup> century*. London: Routledge.
- Smith, J. (2004). Reflecting on the development of interpretative phenomenological analysis and its contribution to qualitative research in psychology. *Qualitative Research in Psychology*, 1(1), 39-54.
- Stake, R. E. (2005). Qualitative case studies. In N.K. Denzin, & Y. S. Lincoln (Eds.). *The Sage handbook of qualitative research* (3<sup>rd</sup> ed.). California: Sage Publications.
- Stork, S., & Sanders, S. W. (2008). Physical education in early education. *The Elementary School Journal*, 108, 197-206.

- Strong, W. B., Maline, R. M., Blimkie, C. J., Daniels, S. R., Dishman, R. K., & Gutin, B. (2005). Evidence based physical activity for school-age youth. *Journal of Pediatrics*, 146(6), 732-737.
- Strydom, H. (2002). Information collection: participation observation. A. S. De Vos, H. Strydom, C. B. Fouché, & C. S. L. Delport (Eds.), *Research at grass roots: for the social sciences and human science professionals* (2<sup>nd</sup> ed.). Pretoria: Van Schaik Publishers.
- Strydom, H. (2005). Ethical aspects of research in the social science and human service professions, in A.S. de Vos, H. Strydom, C. B. Fouché, & C. S. L. Delport (Eds). *Research at grass roots: for the social sciences and human science professionals* (3<sup>rd</sup> ed.). Pretoria: Van Schaik Publishers.
- Sugden, D. A., & Chambers, M. E. (2003). Intervention in children with Developmental Coordination Disorder: The role of parents and teachers. *British Journal of Educational Psychology*, 73, 545-561.
- Summerford, C. (2001). What is the impact of exercise on brain function for academic learning? *Teaching Elementary Physical Education*, 12(3), 6-8.
- Tudor, V. (2005). Measurement and evaluation in physical culture and sport. *Bucharest Publisher Alpha*, 161.
- Umek, L. M., Kranjc, S., Fekonja, U., & Bajc, K. (2008). The effect of preschool on children's school readiness. *Early Child Development and Care*, 178, 569–588. doi:10.1080/03004430600851280
- Van Deventer, K. J., & Van Niekerk, E. (2009). Life orientation in the Foundation Phase (Grades R-3): A survey in selected Western Cape primary schools. *South African Journal for Research in Sport, Physical Education, & Recreation*, 31(2), 147-162.
- Vanderstoep, S. W., & Johnson, S. W. (2009). *Research methods for everyday life: blending qualitative and quantitative approaches*. San Francisco: Jossey-Bass Publishers.
- Venetsanou, F., & Kambas, A. (2010). Environmental factors affecting preschoolers' motor development. *Early Childhood Education Journal*, 37, 319-327.

- Vithal, R., & Jansen, J. D. (2012). *Designing your first research proposal: A manual for researchers in education and the social sciences*. Claremont: Juta and Company Ltd.
- Walter, O. (2007). *Role reversal approach in teaching early childhood basic concepts of kinaesthetic intelligence*. PhD thesis. Anglia Ruskin University, Cambridge and Chelmsford.
- Wang, J. Hui-Tzu (2004). A study on gross motor skills of preschool children. *Journal of Research in Childhood Education*, 19(1), 32-43. Williams, H. G., Pfeiffer, K. A., Dowda, M., Jeter, C., Jones, S., & Pate, R. R. (2009). A field-based testing protocol for assessing gross motor development in preschool children: The CHAMPS motor skills protocol (CMSP). *Measurement in Physical Education and Exercise Science*, 13, 151-165.
- Wright, H., & Sugden, D. E. (1998). School based intervention programme for children with developmental coordination disorder. *European Journal of Physical Education*, 3, 35-50.
- Yin, R. (2009). *Case study research: Design and methods* (4<sup>th</sup> ed.). Thousand Oaks CA: Sage.

---oOo---



## APPENDICES

**APPENDIX 1** – Consent - Principal

**APPENDIX 2** – Consent - Teacher

**APPENDIX 3** – Consent - Parent

**APPENDIX 4** – Consent – Child

**APPENDIX A** – Newsletter from the school

**APPENDIX B** – Research journal

**APPENDIX C** – Reflection from teacher

**APPENDIX D** – Example of coding the data

**APPENDIX E** – Semi-structured interview

**APPENDIX F** – HOD observations

**APPENDIX G** – Movement activities drawings on site

**APPENDIX H** – Movement structured activities over the period of four days

- ❖ Appendix H1 – Day 1
- ❖ Appendix H2 – Day2
- ❖ Appendix H3 – Day3
- ❖ Appendix H4 – Day4

**APPENDIX I – Learners worksheets**

- ❖ Appendix I1 – Template of worksheet 1
- ❖ Appendix I2 – Template of worksheet 2
- ❖ Appendix I3 – Template of worksheet 3
- ❖ Appendix I4 – Template of worksheet 4
- ❖ Appendix I6 – Template of worksheet 5
- ❖ Appendix I7 – Template of worksheet 6
- ❖ Appendix I8 – Template of worksheet 7

**APPENDIX J – Analysis of worksheets**

- ❖ Appendix J1 – Sample of one learner completing worksheet 5
- ❖ Appendix J2 – Sample of one learner completing worksheet 3
- ❖ Appendix J3 – Sample of one learner completing worksheet 2
- ❖ Appendix J4 – Sample of one learner completing worksheet 7
- ❖ Appendix J5 – Sample of one learner completing worksheet 7
- ❖ Appendix J6 – Sample of one learner completing worksheet 6
- ❖ Appendix J7 – Sample of one learner completing worksheet 6

---oOo---



## APPENDICES

### APPENDIX K – Sample of worksheets

- ❖ Appendix K1 – Sample of one learner completing worksheet 5
- ❖ Appendix K2 – Sample of one learner completing worksheet 3
- ❖ Appendix K3 – Sample of one learner completing worksheet 2
- ❖ Appendix K4 – Sample of one learner completing worksheet 7
- ❖ Appendix K5 – Sample of one learner completing worksheet 7
- ❖ Appendix K6 – Sample of one learner completing worksheet 6
- ❖ Appendix K7 – Sample of one learner completing worksheet 6

---oOo---