The effect of a perceptual-motor intervention on the school readiness of grade R learners

by

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PRETORIA

October 2018

DEDICATION

I dedicate this study firstly to our

Heavenly Father for the strength

That He has provided me. Also

To my family for their love, support

And encouragement throughout

This journey

DECLARATION OF AUTHORSHIP AND COPYRIGHT

I declare that the thesis titled "*The effect of a perceptual-motor intervention on the school readiness of grade R learners*" that I hereby submit for the degree PhD at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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ABSTRACT

Quality early childhood education has gained substantial recognition in South Africa but inequalities and deficits remain evident despite progressive policy and effort by a range of role players. School readiness is a particular area of concern. Researchers agree that school dropout can be prevented by promoting children's cognitive and linguistic skills in the Grade R year by providing good learning opportunities. In this regard, existing research indicates that perceptual-motor skills may have a positive impact on school readiness, especially in resource-constrained contexts. Against this background, I conducted a study on the effect of an intervention focused on perceptual-motor skills, on the school readiness of Grade R learners in a resource-constrained community.

In constructing a conceptual framework I integrated the perspectives of cognitive constructivist theory (Piaget, 1953), social constructivist theory (Vygotsky, 1978), information-processing theory (Shraw & McCrudden, 2013) and De Jager's (2012) model of cognitive development. I followed a mixed methods approach and was guided by a pragmatist epistemology. I employed a single case experimental design. Pre-intervention and post-intervention assessments were conducted with 58 Grade R learners, from two quintile 2 public primary schools in South Africa, in order to compare their levels of school readiness before and following the implementation of the perceptual-motor intervention programme. I purposefully selected the participants (Grade R learners and their two teachers). For quantitative data collection I implemented the (i) School Readiness Diagnostic Assessment test (SRDA) (Van den Berg, 2014) and the (ii) Aptitude Test for School Beginners (ASB) (Olivier & Swart, 1988), while collecting qualitative data through semi-structured interviews, observations, field notes and a research diary.

The perceptual-motor intervention programme was developed based on the results I obtained pre-intervention, with a specific focus on addressing the needs identified during this phase of the study. Pre-intervention results obtained on the ASB, namely indicate that the Grade R learners from both schools were not school ready, even

though the Grade R learners tested ready for school on the overall SRDA score, the averages on the sub-tests and three of the seven sub-tests tested below the expected developmental level for school readiness.

Post-intervention test scores indicate that the perceptual-motor intervention had a positive effect on not only the general school readiness levels of the learners, but also on individual perceptual-motor domains. With regard to the ASB, the mean difference between the two schools for the post-intervention scores indicates a statistically significant difference for the experimental group. In terms of the overall average SRDA scores (average of the seven domain averages), post-intervention scores indicate a higher average post-score for the experimental group than for the control school. Even though the difference is not statistically significant, learners demonstrated progress on the SRDA test battery following the intervention. Throughout the study, the quantitative data was supported by the qualitative data. The purpose of the qualitative part of the study was to explore Grade R teachers' understanding of school readiness, perceptual-motor development, and resources that could support the school readiness of learners in resource-constrained settings. After implementation of the perceptual-motor intervention programme, an increase in the levels of school readiness of the participating Grade R learners thus indicates that the intervention programme was successful.

KEY CONCEPTS

- Early childhood development
- Formal schooling
- Grade R
- Perceptual-motor development
- Perceptual-motor intervention programme
- Physical development
- Resource-constrained context
- School readiness

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The effect of a perceptual-motor intervention on the school-readiness levels of grade R learners

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TO WHOM IT MAY CONCERN

This certificate confirms that the above-mentioned student submitted her draft PhD thesis to me for language-editing, including the checking of in-text referencing and the reference list. This was duly edited by me and sent back for revisions. I make no claim as to the accuracy of the research content. The text, as edited by me, is grammatically correct. After my language editing, the author has the option to accept or reject suggestions/changes prior to submission to the supervisor who will look for plagiarism and check the accuracy of the content.

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LIST OF ABBREVIATIONS

- Alternative hypothesis (HA)
- Analysis of covariance (ANCOVA)
- Analysis of variance (ANOVA)
- Aptitude test for School Beginners (ASB)
- Curriculum and Assessment Policy Statement (CAPS)
- Early Childhood Development (ECD)
- Early Childhood Education (ECE)
- National Curriculum Statement (NCS)
- Null Hypothesis (H0)
- Reception year (Grade R)
- School Readiness Diagnostic Assessment (SRDA)
- Single-case experimental design (SCED)
- Zone of proximal development (ZPD)
- Language of Learning and Teaching (LOLT)
- Free State Department of Education (FSDOE)

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CHAPTER ONE:

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION

Ongoing debate and controversy surrounding the topic of the current matric exam results in South African schools are at the order of the day. Such discussions often point to whether or not the educational system is effective. Two years ago, in a *Sunday Times* article titled "Failure breeds 'success' in SA schools" (2014, p.14), Professor Jonathan Jansen, then Vice-chancellor of the University of the Free State, suggested improvements in the quality of education in South Africa. Closely related to this, Professor Osman, Dean of Humanities at the University of Johannesburg (Dugmore, 2014) at the time stated that one needs to look at input from the earliest stage of schooling and not only focus on the matric examination results. This statement by Osman (Dugmore, 2014) is substantiated by research indicating that quality early childhood education (ECE) can improve learning outcomes during both primary and secondary school years (Atmore, Van Niekerk, & Ashley-Cooper, 2013; DoE, 2011).

In recent years, research has often emphasised the co-relation between quality preschool education and children's[1] learning experiences. Longitudinal and concurrent research indicate that good quality ECE can meaningfully benefit children's learning, academic accomplishments, self-esteem and attitudes towards lifelong learning (Sheridan, 2007). Atmore, Van Niekerk, and Ashley-Cooper (2012) state that quality teaching and learning is crucial for optimal childhood development. These authors argue that irrespective of the situation or the environment in which a learner is placed, a quality teacher can create a setting in which a child can develop to his or her full potential in a holistic manner. (Atmore et al. 2012; Burchinal, Hyson, & Zaslow, 2008).

[1] In this thesis, I use "learner" when referring to a child in the school/learning context, and "child" when referring to a child in the primary environment, or when the sentence relates to child development or general child functioning.

Many young children in South Africa grow up in an unequal society where poverty impends their total early development. A high failure rate is evident amongst school beginners in South Africa, as *The White Paper on Early Childhood Education of 2001* points out in the following way: "children raised in poor families are most at risk of poor adjustment to school, increased repetition and school dropout" (DoE, 2001, p.1). Several researchers concur by stating that factors such as low socio-economic status, lack of a resource-rich environment, low quality education and a lack of parental involvement in education, play a significant role in a child's school readiness (Crosnoe, Leventhal, Wirth, Pierce, & Pianta, 2010; Moletsane, 2012). In addition Berry, Dawes, and Biersteker (2013) indicate that malnourishment, childhood illnesses and a lack of early stimulus will compromise learners' cognitive development and school performance.

Based on twenty years of experience as a Grade R teacher in previously disadvantaged schools, as well as on the findings I obtained during my master's degree study[2] including those captured in existing literature, I believe that many children in South Africa enter Grade 1 unprepared to cope with the relevant academic and social activities. The cause of this unpreparedness lies in the emphasis often being placed on accountability and standards by policymakers who should instead focus on the holistic development of the child (Linder, Ramey, & Zambak, 2013). When children enter the formal school system with limitations, for example, a lack of understanding in literacy and numeracy, the gap will more often than not continue to exist, and even widen over time (Frazeur Cross & Conn-Powers, 2011).

Berry et al. (2013) state that although access to early educational learning experiences has amplified in recent years, the school performance of young learners in the foundation phase of public schools is less than acceptable, as evident in the 2014 *Annual National Assessment* results. According to Berry et al. (2013, p.31) "Learning is cumulative, and urgent attention must be given to improving the quality of interventions for young children and to understanding the relationship between early

[2] Harcourt, I. 2013. *The relation between school readiness and home environment.* University of the Free State.

development and learning and its impact on academic performance in later childhood". The question arises whether or not enough has been done specifically for learners from resource-constrained areas to support their school readiness over recent years, stimulation and development at an early stage of life no doubt plays a critical role in good health, growth, success in education and in life (DoE, 2011).

In this regard, the importance of early childhood development in the various domains is reiterated by the South African Screening, Identification, Assessment and Support (SIAS) document (DoE, 2014). This document provides a policy framework for the standardisation of measures to identify, assess and provide programmes for all learners who require supplementary support to increase their partaking and inclusion in school. The SIAS policy is aimed at improving access to quality education for vulnerable children in order to improve their participation and inclusion in school.

One way of responding to the above-mentioned concerns would be to look at the way in which Grade R learners are prepared for formal schooling. School readiness is often seen as the task of parents and teachers who gradually and purposefully have to prepare children for school entry (Britto, 2012; De Witt, 2016). To this end, Ramey and Ramey (2006) maintain that the prevention of school drop-out, low grades, as well as the promotion of children's cognitive and linguistic development, should be emphasised in the Grade R year by providing effective and efficient learning opportunities. In an attempt to respond to this need, I conducted my study in two quintile 2[3] public primary schools in South Africa (DoE, 2001) where school readiness is often a problem (Berry et al. 2013; Biersteker, 2010a).

Erasmus (2012) emphasises that perceptual-motor development is fundamental to school readiness. It is therefore pivotal that learning deficiencies are identified as early as possible and corrected where possible. In another study by Erasmus, Janse van Rensburg, Pienaar, and Ellis (2011), perception, spatial orientation, reasoning and understanding, coordination, as well as gross and fine motor development are indicated as factors associated with levels of school readiness. According to these

[3] According to the Department of Education's system of grading schools, quintile 2 schools are schools located in areas such as informal settlements, with limited available equipment and resources (Department of Education, 2004).

authors, better trained teachers, sufficient resources and equipment, as well as learners being exposed to perceptual-motor stimulation, may be better prepared for formal schooling and possibly close the gap between school readiness and performance.

1.2 PURPOSE OF THE STUDY

Based on the argument in the previous section, the question arises as to how Grade R learners may be supported to become school ready before entering formal Grade 1 schooling, in order to optimally gain from the learning experiences they encounter in further years. In response to this question, this study focused on one area of child development; that is, investigating how an intervention on perceptual-motor development can affect the school readiness of Grade R learners in a resource-constrained setting.

In addition, as background to the intervention I developed and implemented, I set out to investigate how Grade R teachers view perceptual-motor development. The intervention was specifically developed to enrich the current Grade R curriculum as prescribed by the National Curriculum Statement (NCS) which comprises of the Curriculum and Assessment Policy Statement (CAPS)[4].

In summary, I explored and described the levels of school readiness of Grade R learners attending a public primary school prior to and following the intervention I developed. I also explored and described Grade R teachers' understanding of perceptual-motor skills in terms of school readiness. In this way, the study may potentially contribute to the existing knowledge-base on school readiness interventions, enrich school curricula, and facilitate a positive outcome of interventions in this area.

1.3 RESEARCH QUESTIONS

In undertaking this study, I was guided by the following primary research question*:*

[4] The National Curriculum Statement Grades R-12 represents a policy statement for learning and teaching in South African schools and encompasses of the following: (a) Curriculum and Assessment Policy Statements (CAPS) for all subjects listed in this document; (b) National policy relating to the programme and promotion requirements of the National Curriculum Statement Grades R-12; and (c) National Protocol for Assessment Grades R-12.

How can the school readiness of Grade R learners in a public school in a resource-constrained area be supported (or not) by a perceptual-motor skills intervention enriching the Grade R curriculum?

To answer the primary research question, the following secondary questions have been addressed:

- How do the levels of school readiness of Grade R learners from a public primary school compare before and following implementation of a perceptual-motor intervention programme?
- How do Grade R teachers view perceptual-motor skills and the importance of these skills for the school readiness of learners?
- Which classroom and playground-based resources can potentially support perceptual-motor development?
- What does a perceptual-motor enrichment intervention for Grade R learners entail?

1.4 AIM AND OBJCETIVES OF THE STUDY

In this study, my aim was to investigate how Grade R learners in a resource-constrained setting may be supported by a perceptual-motor intervention programme to become school ready before entering formal Grade 1 schooling. In addition, as background to the intervention I developed and implemented, I set out to investigate how Grade R teachers view perceptual-motor development. I explored and described the levels of school readiness of Grade R learners attending a public primary school prior to and following the intervention I developed. I also explored and described Grade R teachers' understanding of perceptual-motor skills in terms of school readiness. In this way, the study may potentially contribute to the existing knowledge-base on school readiness interventions, enrich school curricula, and facilitate a positive outcome of interventions.

The objectives of this study were to:

- determine how the school readiness of Grade R learners in a public school in a resource-constrained area be supported (or not) by a perceptual-motor skills intervention enriching the Grade R curriculum;
- compare the levels of school readiness of Grade R learners from a public primary school before and following implementation of a perceptual-motor intervention programme;
- determine how Grade R teachers view perceptual-motor skills and investigate their understanding of the importance of these skills for the school readiness of learners;
- establish which classroom and playground-based resources can potentially support perceptual-motor development; and
- establish what a perceptual-motor enrichment intervention for Grade R learners entail.

1.5 CONCEPT CLARIFICATION

In this section I describe the key concepts of this study.

1.5.1 Perceptual-motor intervention

Perception is a fundamental process during which the child learns to see, move and hear in various stages and ways. Perception implies the ability of the brain to make contact (and sense) with the surrounding world by means of sensory organs (De Witt & Booysen, 2007). It involves the brain's control of the information which reaches the central nervous system *via* the sensory organs, and its processing of, and ultimately a reaction to the information (De Witt & Booysen, 2007). De Jager (2009, p.10) states that "once the mechanical parts work well together, information needs to flow along the connective wiring". Therefore, cognitive development and perception go hand-in-hand, and support one another (Van Zyl, 2004).

Motor skills improve at an immense tempo in the pre-school years. Motor skills can be divided into two categories; namely fine motor skills, and gross motor skills. Gross motor skills comprise the use of large muscles for actions such as running and climbing. The development of gross motor skills imply stronger muscles, better

physical coordination and improved balance (Bruce, 2010). Fine motor skills entail the use of the small muscles in the hands and fingers, for painting, cutting and drawing. Improved coordination of small motor muscles and dexterity will enable children to draw more accurately and to start writing easily (Louw & Louw, 2007).

Perceptual abilities and motor abilities thus form the basis for the development of perceptual-motor skills, which are essential for a child's actions in the world. Young children must, for example, establish a broad base of motor experience in order for higher learning skills to develop properly (De Witt, 2016). Goddard-Blythe (2011, p.18) aptly asserts that "learning is not all in the mind but is also a physical activity". A child's motor abilities are vital tools for learning. Different stages of motor skills development provide an insight of the maturity regarding the functioning of the central nervous system; in other words, the link between the brain and the body, which in turn provides the basis for learning (De Jager, 2014; De Witt, 2016; Goddard-Blythe, 2011).

A strong body of evidence shows that early childhood intervention programmes may have a positive effect on preventing delays in cognitive development, and increasing readiness to learn. Furthermore, evidence of improved academic achievement and school readiness levels supports this conclusion (Anderson, Shinn, Fullilove, Scrimshaw, Fielding, Normand & Garande-Kulis, 2003; Berk, 2001; Bulotsky-Shearer, Wen, Faria, Hahs-Vaughn, & Korfmacher, 2012). In light of this, a perception-motor intervention programme was designed as part of this study to incorporate activities that may promote perceptual-motor skills development among Grade R learners. The intervention programme was designed for a ten-week implementation period, offered for 30 minutes per day as part of the current Grade R curriculum. As such, the intervention was designed to run concurrently with the national Grade R curriculum - not replacing the curriculum, but rather enriching it.

1.4.2 School readiness

The levels of school readiness required to succeed academically in later school years have been the focus of developmental and educational studies for many years (Excell & Linington, 2011). At the age of six, readiness for formal schooling forms the foundation and gives meaning to the formal learning situation. A learner who starts

school not yet ready for formal learning, starts with a disadvantage which can affect his or her future development (De Witt, 2016; Pellino, 2006).

Historically, school readiness was simply viewed as the level of functioning of a child, indicating that a child is able to work in a focused manner. McGettigan and Gray (2012) maintain that school readiness should rather be seen as a multidimensional concept that incorporates all aspects that may contribute to a child's ability to learn. These authors propose that the primary mechanisms through which children acquire school readiness competencies are *via* social relationships with their parents, teachers and peers. Moreover, the important role of the environment is stressed (McGettigan & Gray, 2012). Similarly, in a study by UNICEF (Britto, 2012), the link between the individual and the environment is emphasised, indicating that the environment can support and promote development.

1.4.3 Grade R in the South African school context

In South Africa, Grade R is the year of schooling prior to commencement of formal instruction in Grade 1. Grade R forms part of the Foundation Phase, referred to as Grade R - 3 (DoE, 2011). *The White Paper 5 on Early Childhood Education* (DoE, 2001) has been the main guide to implementing universal access to Grade R since 2010. This policy is directed at children from birth to six years of age, and emphasises the need to provide education to Grade R learners. The main purpose of the policy is to ensure that Grade R is phased in as part of the formal schooling system (DoE, 2001).

The Grade R year plays an important role in the development of young learners. The primary focus of the Grade R year is the preparation of learners for a lifelong path of learning by enhancing learners' optimal holistic development (Davin & Van Staden, 2005). Grade R Teachers are expected to facilitate quality play and imitation as young children learn best by playing and imitating others (Davin & Van Staden, 2005).

1.4.4 Resource-constrained environment

For the purpose of this study, I refer to learners who live in poverty as those from resource-constrained environments. Definitions of deprivation reflect the idea of loss or destitution, and also a lack, shortage or deficiency of the elements required for

adequate development (De Witt, 2016). De Witt (2016) explains that low economic status, low social status, low levels of education, employment in inferior jobs or unemployment, as well as limited social involvement, are all symptoms of resource-constrained environments.

According to Berry et al. (2013) and Neves (2012), many children in South Africa grow up in an unequal society where poverty affects their early development. Exposure to crime and violence often occurs and the mortality rate for children under five is generally high. Malnutrition, HIV and childhood illnesses are associated with high mortality rates. Unfavourable environmental circumstances, such as inadequate housing, and insufficient water and sanitation will probably result in poor hygiene, and cause infections and disease. These negative factors can all shape children's holistic development and their productivity in later life (Neves, 2012).

1.5 CONCEPTUAL FRAMEWORK

In undertaking this study, I relied on the following theories: constructivist theories such as the socio-constructivist theory of Vygotsky (1978), cognitive constructivist theories of Piaget (1953) and Powell and Kalina (2008), cognitive development theories such as the information-processing theory (Schraw & McCrudden, 2013), and De Jager's model of cognitive development (De Jager, 2012; Van den Heever, 2013). In this section I provide a brief overview of my conceptual framework as indicated in Figure 1.1, outlining school readiness as a multidimensional concept 1. More detail follow in Chapter 2.

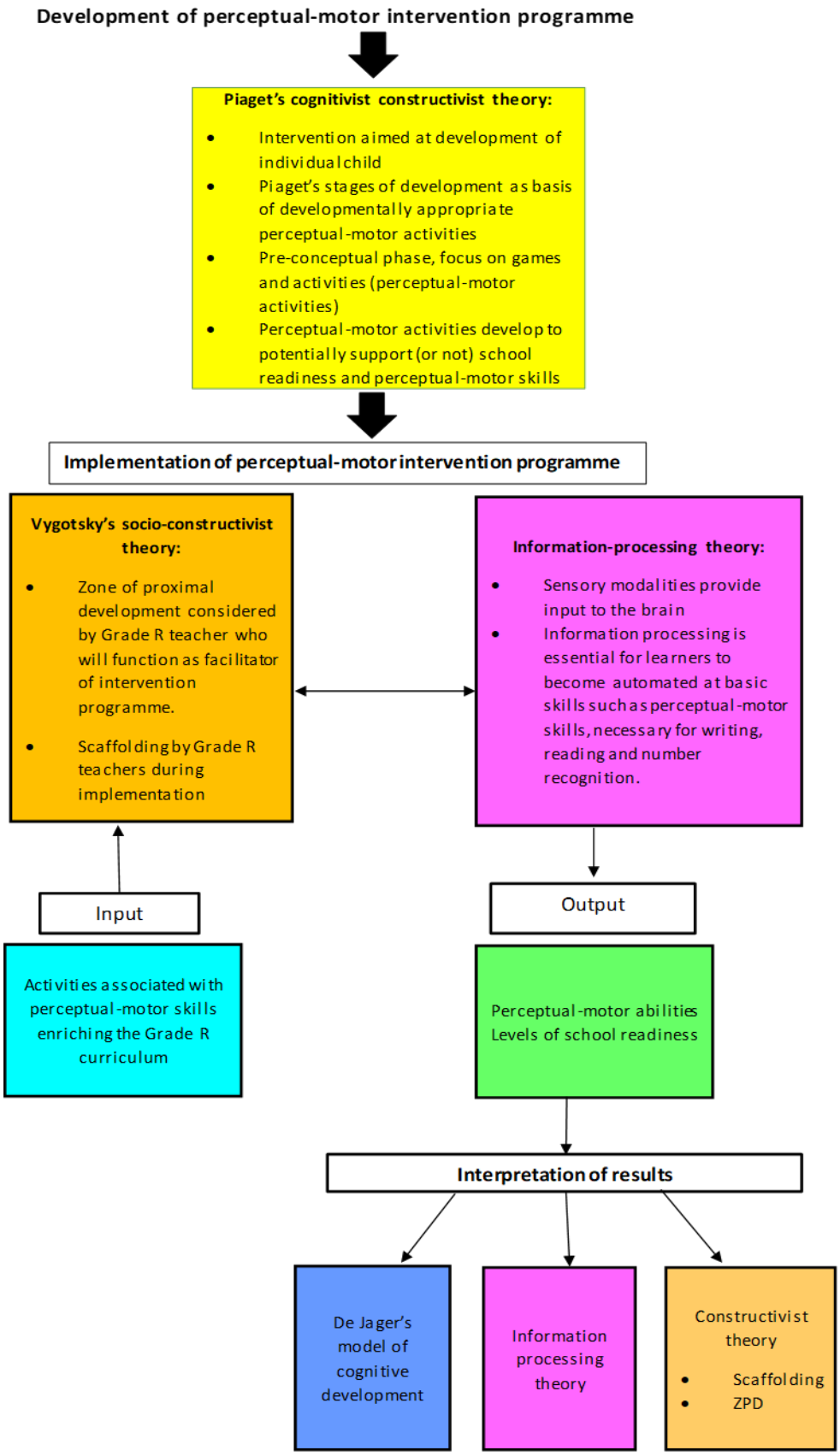

Figure 1.1: Compiling a conceptual framework for the study

Various studies (Cameron, Brock, Murrah, Bell, Worzalla, Grissmer & Morrison, 2012; De Jager, 2014; Erasmus et al. 2011; Pienaar, Barhorst, & Twisk, 2014; Van Zyl, 2004) indicate positive relationships between perceptual-motor skills development and school readiness. Both Piaget and Vygotsky suggest that children are cognitively ready for certain experiences at any given time of their development but not for other experiences (McDevitt & Ormrod, 2013). During the design of the perceptual-motor intervention programme, I relied on Piaget's cognitive constructivist theory, focusing on the pre-conceptual phase, as this phase is associated with children between the ages 2 and 7, and includes learners enrolled in Grade R. During the pre-conceptual phase, children require games and activities to promote conceptual development (Piaget, 1953). These forms of activities can ultimately lead to more advanced levels of cognitive development which is required for formal schooling. In this regard, I considered the importance of concrete experiences before emphasising more abstract thinking and development. In line with Piaget's description of the phases of development, I thus emphasised practical and concrete experiences in the intervention programme, which was required as a basis for learning (Beard, 1969).

During implementation of the intervention programme, I also relied on the socio-constructivist theory of Vygotsky (Vygotsky, 1978). During this phase, a Grade R teacher fulfilled the role of facilitator of the intervention, encouraging learners' participation and learning. This process involved learners as active participants where accomplishments were viewed as an index of development. Learners were thus supported by an adult to think, know and do, using scaffolding to break down complex tasks and adjusting the level of assistance as learners progressed. Throughout, participating learners' zone of proximal development (ZPD) was considered.

In addition, I utilised information-processing theory and De Jager's model (De Jager, 2009) of cognitive development during implementation of the perceptual-motor intervention programme. Tasks associated with perceptual-motor skills (input) were provided to Grade R learners with the aim of assisting them to process sensory modalities, selectively directing their attention to important information and taking part in as much automated processing as possible (Schraw & McCrudden, 2013). According to Schraw and McCrudden (2013), it is important for learners to become automated at basic perceptual skills in order to be ready for formal schooling (output).

In terms of De Jager's model (2009) of cognitive development, I was guided by the theory on how the brain is connected with the senses during the implementation phase of the intervention, and how muscles form the foundation of physical development.

During the post-intervention phase, I once again relied on De Jager's (2009) model of cognitive development, the information-processing theory of Schraw and McCrudden (2013), and Vygotsky's (1978) socio-constructivist theory when I interpreted the Grade R learners' levels of school readiness. Changes in the results obtained from the *School Readiness Diagnostic Assessment* (Van der Berg, 2014) and the *Aptitude Test for School Beginners* (Olivier & Swart, 1988) were explained in terms of the information-processing theory, aligned to Schraw and McCrudden's (2013) view that perceptual-motor skills can become automated and result in increased levels of school readiness. De Jager's model of cognitive development indicates that learning will take place *via* the senses and movement. As such, movement or motor skills can potentially improve learning (De Jager, 2012; High, 2008; Krog & Kruger, 2011; Pienaar et al. 2014).

Throughout, I relied on scaffolding and the zone of proximal development, as described in the socio-constructivist theory of Vygotsky (1978) in an attempt to promote optimal learning that can potentially enhance school readiness levels. To this end, I relied on the conceptual framework to plan the intervention and support, and to interpret the results I obtained post-intervention.

1.6 OVERVIEW OF PARADIGMATIC PERSPECTIVES

In line with the focus of my research, the information being collected, the context and the participants, I relied on pragmatism as the epistemological paradigm (Creswell, 2009). Pragmatism as a world view arises out of actions, situations and consequences. According to this paradigm, the researcher collects data on *"what works"* to address the research question (Creswell & Plano Clark, 2007, p.24) and to find solutions (Creswell, 2009). As the focus of pragmatism falls on the consequences of research, it is pluralistic and orientated towards practicality (Creswell & Plano Clark, 2007). Pragmatism is furthermore recommended as philosophical underpinning for mixed-methods studies (Biesta, 2010; Creswell, 2009).

Creswell and Plano Clark's (2007) mixed-methods research provides strengths that counterbalance the weaknesses of quantitative and qualitative research. Consequently, a mixed-methods methodological approach provided for comprehensive evidence, and instead of being restricted to one type of data collection technique, I was able to utilise various tools for data collection and documentation purposes. More specifically, I followed a sequential explanatory mixed-methods approach (QUAN→qual, (QUAN) [5]). As such, I first collected and analysed quantitative data (QUAN) and then qualitative data (qual) that could build on the results of the initial quantitative (QUAN) phase. To this end, I viewed sets of data as separate, but later also made connections
(Creswell, 2009).

1.7 OVERVIEW OF THE RESEARCH DESIGN AND PROCESS

In this section, I briefly introduce the research design and steps of the research process. Detailed discussions on these aspects follow in Chapter 3.

1.7.1 Research design and participants

I utilised a single-case experimental design (Nock, Michel, & Photos, 2007; Yin, 2013). According to Yin (2013) a "case" is a real-life phenomenon characterised by concrete manifestation. The case I studied was Grade R learners' levels of school readiness in a resource-constrained context, prior to and following an intervention.

A single-case experimental design (SCED) is a form of case study design that is based on manipulation (some participants in this study could benefit from the intervention), control (some participants formed part of a control group and did not initially receive the intervention) and randomisation, which was used to assign participants to different groups (Lindegger, 2006; Maree & Pietersen, 2010a). A SCED typically implies a baseline assessment (measurement), in this case a pre-intervention test on school readiness, followed by an intervention with a section of the participants; in other words,

[5] Quantitative data formed the primary data set and is thereby indicated in capital letters (QUAN). The secondary data set is indicated in lower case letters (qual) (Creswell & Plano Clark, 2007).

an experimental group (Lindegger, 2006). A post-intervention test of school readiness followed.

Yin (2013) and Bryman (2002) concur that case study designs can be employed for both quantitative and qualitative research, which supports the mixed-methods approach I followed. Qual data focused on information about the school environment of the participating Grade R learners, Grade R teachers' experiences and views on the perceptual-motor skills of the learners in their classes, and the link between perceptual-motor skills and school readiness. Qual data supported the QUAN data obtained from assessments of the levels of school readiness prior to and following the perceptual-motor intervention programme, by means of school readiness instruments.

The population in the study comprised of 58 Grade R learners and two Grade R teachers from two quintile 2[1] public primary schools in the Heidedal Township, Free State, South Africa. For the qual part of the study I purposively selected individuals (Grade R teachers) who could potentially provide the information I required to elaborate on the QUAN data I had obtained. Niewenhuis (2010b) explains purposive sampling as the process of selecting participants due to certain defining characteristics which qualify them as holders of the data required for a study. The selection criteria I applied required Grade R teachers who teach according to the current Grade R curriculum in public primary quintile 2 schools in the Heidedal Township, are able to converse in English and/or Afrikaans, and willing and available to participate in the study.

For the QUAN part of the study, I involved individuals (Grade R learners) who were representative of the population (Creswell & Plano Clark, 2007). I employed purposive sampling to identify the 58 Grade R learners from both schools and tested all of them for school readiness pre-intervention. Thereafter only one Grade R class from School A (experimental group, n=33) participated in the intervention while the other Grade E class from School B formed the control group (n=25). The experimental group (School A) was selected randomly, preventing bias in terms of the characteristics of individuals included in the group (Creswell, 2005).

1.7.2 Phases of the study

Figure 1.2 provides an overview of the research process.

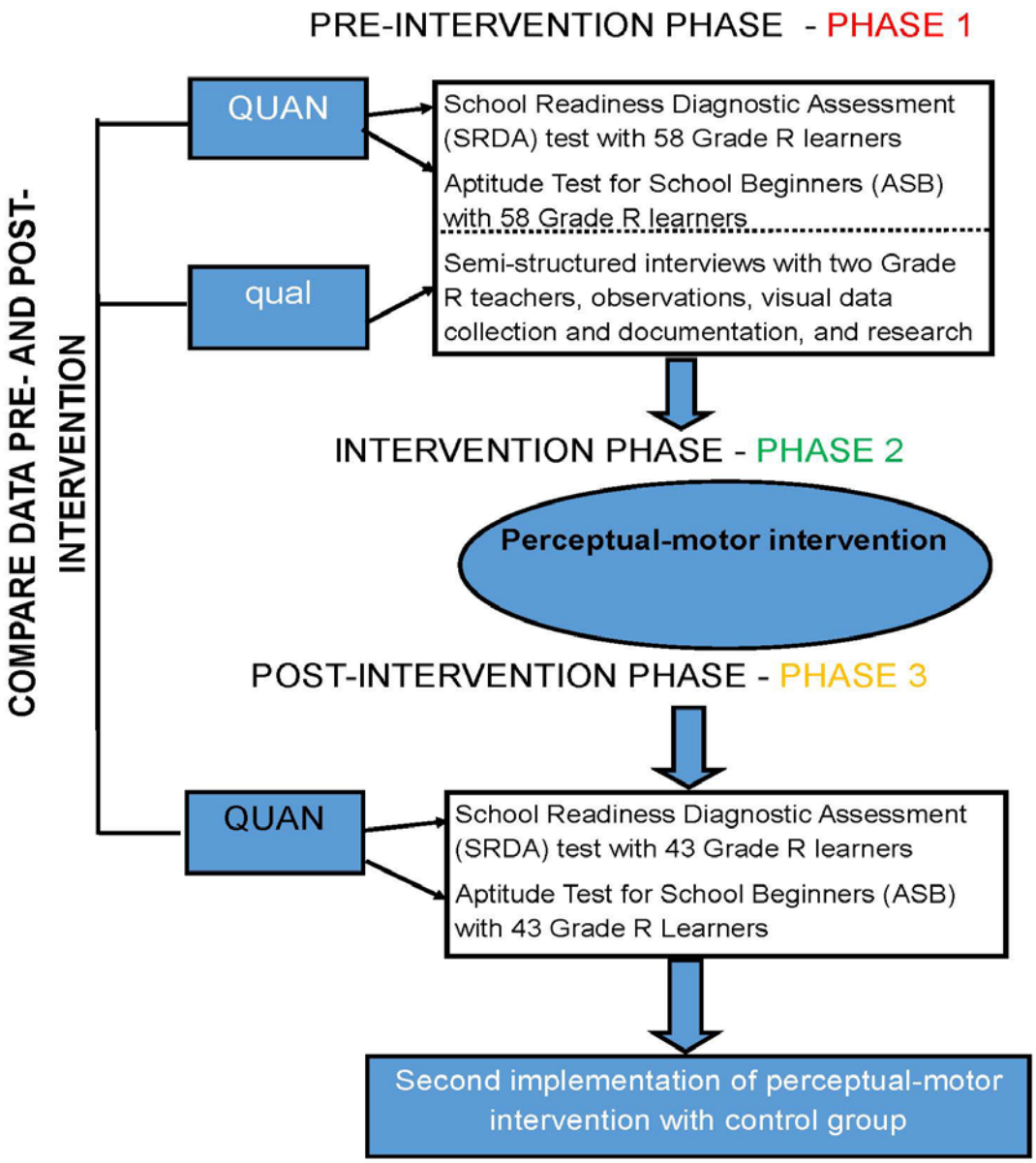

Figure 1.2: Overview of the research process

Data were obtained from two schools each having a Grade R classes. A school readiness test was conducted prior to the intervention with 58 learners (both classes) of which 33 (one class) formed the experimental group. The pre-intervention phase provided data on the learners' levels of school readiness specifically in terms of perceptual-motor skills. A perceptual-motor enrichment intervention programme was then developed and facilitated by one of the teachers, guided by me, over an eight-week period.

After implementation of the intervention programme with the experimental group, a post-intervention assessment was conducted with both the experimental (31 learners) and control groups (12 learners) to determine whether or not the intervention programme had resulted in any change in terms of school readiness and perceptual-motor skills development of the experimental group. Normal child development was taken into account. After completion of the field work, the intervention was repeated with the learners who formed part of the control group.

1.7.3 Data collection and documentation

In this study, the qual data that I collected supplemented the primary QUAN data set (Creswell & Plano Clark, 2007). For this purpose I adopted a sequential data collection process (Creswell & Plano Clark, 2007).

1.7.3.1 QUAN data collection and documentation

I collected QUAN data by implementing the *School Readiness Diagnostic Assessment test (SRDA),*[6] (She or he) and the *Aptitude Test for School Beginners (ASB)* (Olivier & Swart, 1988). Both were pre-intervention and post-intervention strategies with the participating Grade R learners (n=58 pre-intervention, and n=43 post- intervention). The SRDA assesses the full spectrum of school readiness, and was developed to obtain a differentiated view of the levels of school readiness of learners (Van der Berg, 2014). The aspects of school readiness included in the test relate to bilateral integration and symmetry, hand-dominance, midline crossing, fine motor activities, perceptual skills and gross motor skills, and social and emotional development.

[6] Developed by Theresa van den Berg, the SRDA assesses school readiness by means of worksheets for children between 5 and 6-years.

The *Aptitude Test for School Beginners* (ASB) by Olivier and Swart (1988) supported the data collected *via* the SRDA. This test aims to obtain a differentiated picture of certain aptitudes of school beginners (Olivier & Swart, 1988), focusing on comprehension skills based on the perceptual, reasoning, spatial, gestalt, numerical, co-ordination, memory, and verbal domains. After I had administered and interpreted the two instruments, I specifically focused on the data related to perceptual-motor development in order to plan the intervention. To this end, I thus strongly relied on the data obtained on sub-tests, assessing skills related to perceptual-motor development.

1.7.3.2 Qual data collection and documentation

I utilised semi-structured interviews, observation, visual data collection and documentation strategies, and a research diary, for collecting and documenting qual data. During *semi-structured interviews,* I obtained data from two Grade R teachers regarding their understanding and perception of the Grade R curriculum, the perceptual-motor development of the learners in their classes, and the effect of perceptual-motor development skills on the school readiness of Grade R learners. I also explored their views on the nature and availability of resources inside and outside the classroom that can potentially support development. I used an *audio-recorder* to record all interviews (after gaining permission from the participants), which were later transcribed verbatim for the purpose of data analysis. I also compiled *field notes* during interviews, thereby documenting the data collection process and ideas of the participants.

I furthermore relied on *observation* to obtain first-hand experience of a typical day in a Grade R class in the selected school, as part of the pre-intervention phase of the study. Observation took place from the beginning until the end of the school day. I paid specific attention to class and lesson structure, the resources available, teacher conduct, classroom activities and learner participation. During the pre-intervention and post-intervention testing of the learners, I also observed their reactions and approaches to complete the tasks put to them. I furthermore employed observation as a data collection strategy during the implementation of the perceptual-motor intervention programme. Detailed *field notes* as well as *photographs* were used to document the data. Throughout, I took on the role of *"Observer as participant"*

(Niewenhuis, 2010b, p.85), looking for patterns of behaviour in an attempt to understand the perceptions and beliefs of the participants being observed in the setting of a Grade R classroom.

Finally, I used a *research diary* to capture reflexive notes and my impressions of the data and research process, as well as my thoughts on data analysis throughout the process. I also recorded my *field notes* in my research diary. My research diary therefore allowed me to supplement the data I obtained during interviews and from observations. It furthermore allowed me to reflect on my own experiences, and consider what was revealed about my assumptions as the study progressed. Additionally, the research diary provided a useful tool to keep track of the research process and record concerns that arose (Nadin & Cassell, 2006). The qual data I collected supported the QUAN data and guided me in developing the perceptual-motor intervention, and eventually evaluating its effect. I discuss the data collection and documentation process in more detail in Chapter 3.

1.7.4 Development and implementation of perceptual-motor intervention

I designed the perceptual-motor enrichment intervention programme after the first round of data collection, involving both the control and experimental groups. I collected QUAN data to determine the levels of school readiness of the participating Grade R learners. The SRDA also highlighted possible perceptual backlogs. In support of the QUAN data, I collected qual data from two Grade R teachers regarding their understanding of perceptual-motor development and its relation to school readiness.

Based on the data I obtained, I developed a perceptual-motor development intervention programme (Appendix B), including activities focused on the areas where limitations had been identified amongst the participating Grade R learners. The afore-mentioned was done following the pre-intervention data collection phase, more specifically in terms of perceptual-motor skills. In developing the intervention, I consulted with occupational therapists and other educational psychologists. I used the current Grade R curriculum as a guideline in identifying and developing enriching activities that could form part of the intervention programme, against the background of existing perceptual-motor programmes. I also developed the intervention in consultation with my supervisors.

Following development of the intervention programme, one of the participating Grade R teachers implemented it over an 8-week period, presenting three lessons per week of 40 minutes each. Lessons included perceptual-motor stimulation activities in the form of exercises, games, songs and rhymes. I discuss the development of the intervention in more detail in Chapter 3.

1.7.5 Data analysis

In this study I followed a sequential data analysis process. Analysis of the QUAN data therefore guided my analysis of the qual data, with the latter supplementing the former (Creswell & Plano Clark, 2007).

I followed an experimental approach (Maree & Pietersen, 2010b) in analysing the *QUAN data.* As I attempted to determine to what extent a perceptual-motor intervention affected the levels of school readiness of Grade R learners in a public primary school, I used a pre-test/post-test control group strategy. More specifically, I used descriptive statistics to organise and summarise the QUAN data in a significant way (Pietersen & Maree, 2010b). Immediately after I measured the relevant variables, the scores on these variables were transformed statistically to assist me in describing the data more succinctly (Durrheim, 2006a).

Therefore, after scoring the school readiness tests, raw test scores were processed statistically in order to establish t-test scores. The t-test was utilised in order to compare the two independent groups based on their scores on the quantitative variable (Pietersen & Maree, 2010c). After processing and analysing the data, I used the results from the sample to draw conclusions. I was thus able to determine the school readiness levels of Grade R learners before and after implementation of the intervention programme. During the pre-intervention phase, school readiness test data were also used to identify developmental areas which were below the expected standard, to focus on these areas during the design and implementation of the intervention.

For qual data analysis, I completed thematic inductive content analysis. Thematic induction implies inferring general rules or classes from specific instances (Terre Blanche, Durrheim, & Kelly, 2006a), and identifying themes and related sub-themes. I

implemented the following steps in analysing the qual data (Niewenhuis, 2010a; Terre Blanche,Durrheim & Kelly, 2006a).

- Coding, which entails reading through the transcribed data and dividing it into meaningful analytical units or segments.
- Establishing themes or categories, following the step of coding inductively.
- Verifying the categories or themes by checking whether or not information had been captured correctly.

Saturation of data occurred once themes were fully developed and no new information could be added to the list of themes (Creswell, 2005). The purpose of the interpretative analysis which I completed was thus to provide a detailed description of the characteristics, processes, transactions and contexts that constitute the effect of a perceptual-motor intervention programme on the school readiness of Grade R learners form a resourced-constrained setting (Terre Blanche et al. 2006a). I discuss the manner in which I completed qual data analysis in more detail in Chapter 3.

1.8 QUALITY CRITERIA

Terrell (2012) suggests certain guidelines for controlling validity in standard QUAN and qual research, as well as for mixed-methods studies.

1.8.1 Validity and reliability of school readiness tests

Validity in quantitative research is supported when an instrument measures what it is set out to measure (Maree & Pietersen, 2010a; Mukherji & Albon, 2010). In this research the ASB (Olivier & Swart, 1988) and Van den Berg's SRDA (2014) were used to assess school readiness among Grade R learners from two public primary schools. The ASB is a standardised test with intact statistical reliability (consistency of test measures expressed as coefficient) and validity. The ASB was selected because it assesses the school readiness of learners between five and seven years old. The norms of the test were established specifically for this period (Olivier & Swart, 1988) and the test has been standardised for learners such as the participants in this research.

Reliability in quantitative research has to do with the consistency or repeatability of a measure or instruments (Maree & Pietersen, 2010a). The reliability of a test such as the ASB is conveyed as a coefficient which can be any value between 0 and 1 (Van Zyl, 2012). The higher the reliability of a test, the smaller the difference between the testee's scores in repeated administrations of the test, the more valuable such test results will be (Pietersen & Maree, 2010a). The reliability coefficient of the ASB test is acceptable (Olivier & Swart, 1988). Establishment of norms were initially obtained by applying the battery to 1796 learners for the ASB's standardisation process. The learners were randomly selected from a representative sample of 109 schools throughout South Africa (Olivier & Swart, 1988).

Van der Berg (2014) researched the SRDA over a period of 12 years, doing an in depth literature review as background to designing a learning and milestone developmental profile that is relevant to a typical five to six year old child. Research was furthermore conducted in terms of perceptual-motor development by means of the sensory domains. Tables of scores were subsequently drawn up to compare developmental milestones between children in order to identify similarities. I selected the SRDA for this study as this test is current, was compiled in line with the South African Grade R and Grade 1 curricula currently in use, and focuses on perceptual-motor development.

1.8.2 Trustworthiness of qualitative findings

Trustworthiness refers to the way in which a researcher is able to persuade the audience that the research is of high quality and meets five criteria, referred to in this section and discussed in more detail in Chapter 3. It is generally accepted that the use of multiple methods of data collection (Niewenhuis, 2010b) such as in this study, will support trustworthiness. Using multiple methods also supports *transferability***,** which indicates that the reader will be able to use findings and transfer them to other contexts that she or he regards as similar to the one where a study had been conducted (Kelly, 2006a).

Dependability refers to the degree to which a reader can believe that a study and its findings did indeed develop as the researcher reports (Van der Riet & Durrheim, 2006).

Dependability is achieved through rich and detailed descriptions of how certain actions are ingrained in a study, as well as by means of a statement of methods used to collect and analyse data (Van der Riet & Durrheim, 2006). *Conformability* is the degree to which results can be confirmed or supported by others (Trochim, 2006). Confirmation indicates whether or not data confirm general findings in the field (Shenton, 2004).

Credibility refers to the conscious effort of a researcher to establish confidence in an accurate interpretation of the data (Shenton, 2004). In order to improve the credibility of my qualitative content analysis, I did not only implement data collection strategies that can implore representations, but also used transparent processes for coding and drawing conclusions from the raw data (Zhang & Wildemuth, 2008). Lastly, Seale (1999) states that *authenticity* **i**s demonstrated when researchers can display that they have represented various different realities (impartiality). Authenticity is determined by ontological, catalytic and tactical authenticity (Onwuegbuzie, Leech, & Collins, 2010; Seale, 1999).

1.9 ETHICAL CONSIDERATIONS

In carrying out this study, I ensured that the research participants were protected from psychological and physical harm at all times. To this end, I adhered to the following principles:

- *Informed consent*: All participants regardless of their age were made aware of the nature, aim and benefits of the study prior to their participation. Adult participants (teachers) were required to complete consent forms in order to formalise their willingness to participate in the study. Permission was also obtained from the DoE as well as from the relevant school principal (Berk, 2013). Parents or guardians of participating learners were required to complete consent forms, whereby they agreed that their children/child/ward could participate in the study. Grade R learners completed assent forms to indicate their agreement to participate (Noret, 2010; Spriggs, 2010). All participants took part voluntarily and were able to withdraw from the study at any time.
- *Protection from harm***:** I did not use any procedures that could impose physical or psychological harm to child or adult participants (Berk, 2001). Where I

identified potential areas that required professional intervention, I referred the learner to a counsellor or educational psychologist (McDevitt & Ormrod, 2013).

- *Confidentiality*: All information about participants in this research has been kept confidential. All research data have similarly been dealt with confidentially (Louw & Louw, 2007).
- *Anonymity*: As anonymity of information should always be preserved, no information was used other than that for which permission had been obtained. In complying with the requirements for ethical data sharing, I carefully considered whether or not data included might have violated participants' anonymity, and avoided this at all times (Chowdhury, 2014).
- *Trust*: I ensured that the relationship between the participants and me was built on trust. To this end, I undertook to keep child participants fully informed about any changes, or amendments to the research project, to actively collaborate with all role-players and promote the best interests of learners and protect their wellbeing, and to continually discuss with child participants the conditions of their participation (Human-Vogel, 2004).
- *Bias:* I, as the researcher, as well as fieldworkers assisting with data collection, stayed detached from the research participants, so that unbiased conclusions could be drawn (Durrheim & Painter, 2006).

1.10 OUTLINE OF THE CHAPTERS

CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY

Chapter 1 is an introduction and orientation to the study, stating the background, rationale and research questions that directed the study. I clarify key concepts and introduce the conceptual framework that guided this study. I introduce the selected research methodology and provide a brief overview of the ethical guidelines I considered.

CHAPTER 2: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

In Chapter 2, I discuss existing literature on perceptual-motor development, school readiness, Grade R and resource-constrained environments. I also investigate the relation between school readiness and perceptual-motor development and the potential value of a perceptual-motor intervention programme on the levels of school

readiness of Grade R learners in a resource-constrained school setting. I furthermore explain the conceptual framework of my study and discuss the integration of various relevant concepts underlying the framework.

CHAPTER 3: RESEARCH METHODOLOGY AND STRATEGIES

In Chapter 3, I discuss and justify the research process and methodological choices I made. I explain the research design, selection of participants, and data collection, documentation and analysis strategies I employed. I also elaborate on the measures I took to ensure rigour, and the ethical considerations I respected.

CHAPTER 4: RESULTS OF THE STUDY

In Chapter 4, I present both the QUAN and qual results obtained from pre-tests and post-tests. Results obtained during the pre-intervention phase guided me in developing the perceptual-motor intervention programme that was implemented.

CHAPTER 5: FINDINGS OF THE STUDY

In Chapter 5, I present the findings of the study, referring to recent literature on school readiness and Grade R, perceptual-motor development, resource-constrained environments and the outcome of the perceptual-motor intervention programme. Findings are presented and interpreted through the lenses of the various theories integrated into the conceptual framework.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

In Chapter 6, I draw conclusions, based on the findings I obtained. I address the research questions, highlight the contribution of the study and reflect on limitations of the research. Finally, I make recommendations for training, practice and future research.

1.11 CONCLUSION

In this chapter, I presented a brief overview of my research by outlining the rationale, purpose and research questions that guided this study. I introduced the selected paradigmatic and theoretical perspectives in order to orientate the reader concerning

the specific schools of thought I relied on. I briefly stated the methodological strategies I employed, and the ethical considerations and quality criteria I aimed to adhere to.

In Chapter 2, I explore existing literature pertinent to this study. I first discuss the importance and domains of early childhood development Next, I explore school readiness, the reception year (Grade R), the current South African Grade R curriculum and school readiness of learners from resource-constrained settings. I pay special attention to perceptual and motor development, and the relation between perceptual-motor skills and school readiness. I also contemplate the possibility of enriching the Grade R curriculum by means of a perceptual-motor intervention programme. I conclude Chapter 2 with an explanation of my conceptual framework. I describe the theories that underpin my conceptual framework, namely the socio-constructivist theory of Vygotsky (1978), cognitive constructivism of Piaget (1953), cognitive development theories involving information processing (Schraw & McCrudden, 2013) and De Jager's (2012) model of cognitive development.

CHAPTER TWO:

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

In Chapter 1, I introduced the current study, stated the purpose of my research and formulated research questions. I introduced the conceptual framework I compiled and briefly discussed the selected epistemological and methodological paradigms. I provided a broad overview of the research process and referred to ethical considerations and the strategies I employed to ensure validity, reliability and trustworthiness.

Early Childhood development can be regarded as the foundation for any performance later in life. In this chapter I discuss childhood development in terms of the various domains of development with a specific focus on perceptual-motor development. I explore existing intervention programmes for learners who enter formal schooling and then discuss school readiness, the reception year, and the current South African Grade R curriculum. Throughout my discussions, I focus on contemporary existing literature related to these phenomena as background to the empirical study I undertook. I conclude the chapter by explaining the theoretical perspectives underlying my study and how I integrated components of these in constructing a conceptual framework. I also explain how I relied on this conceptual framework for data collection, analysis and interpretation of the results I obtained.

2.2 EARLY CHILDHOOD DEVELOPMENT (ECD)

An emphasis on quality early childhood education is not new. The importance of education in the early years was already mentioned by ancient Greeks, followed by various other educationists throughout the years such as Pestalozzi, Froebel, Rousseau, Lock and Isaacs (Excell, Linington, & Sethusha, 2015). In South Africa, pre-school education was introduced in the 1930s, however the roll-out of this was irregular, resulting in many South African children not having access to quality pre-

school education during the early years (Ebrahim, 2010). One of the visions of the new democratic government that came into power in 1994 was for all South African children to have access to some form of pre-school education. Accordingly, a pre-school year, namely Grade R, was introduced in 2001 (DoE, 2001). The hope was that one year of preschool education would be sufficient to help children cope more successfully in Grade 1, however development and learning begin even before birth. However, although Grade R should undoubtedly be seen as important for preparing children for formal schooling, it cannot be seen as a solution to all schooling difficulties (Excell, Linington & Sethusa, 2015). Many stakeholders including principals, parents and educators support a more didactic approach. Thus, according to this approach, the main aim of the Grade R programme should be preparing children for Grade 1, focusing on the three R's namely reading, writing and arithmetic (Excell & Linington, 2011). Excell and Linington (2011) furthermore state that in the South African context, Grade R teachers are interpreting the curriculum in a very limited way, instead of striving to prepare children for Grade 1 through holistic development and specific learning dispositions, which would lead to a less formal approach in Grade R.

As stated, early childhood is acknowledged as a critical phase in human development (De Witt & Booysen, 2007; Sherry & Draper, 2012), in terms of the social, emotional, cognitive and physical well-being of young learners (Atmore et al. 2013). As a result, the significance of early childhood development (ECD) has been emphasised globally and is even regarded as critical to address inequality and poverty (Atmore et al. 2013; Cappeloni, 2013). Many countries have increased public investment in early childcare services, with the intention of providing all learners with equal opportunities for succeeding at school (Cote, Geoffroy, & Pingault, 2014). In this regard, Cote et al. (2014) state that the provision of educational early childcare seems to be of particular importance for disadvantaged learners who may not necessarily receive adequate educational support at home.

Many South African learners, their families, teachers, communities and the South African Government, face an array of challenges, such as poverty, poor quality education, poor health and nutrition, and HIV and AIDS. Figure 2.1 captures Biersteker's (2012, p.52) summary of general risk factors that may impact on ECD in South Africa.

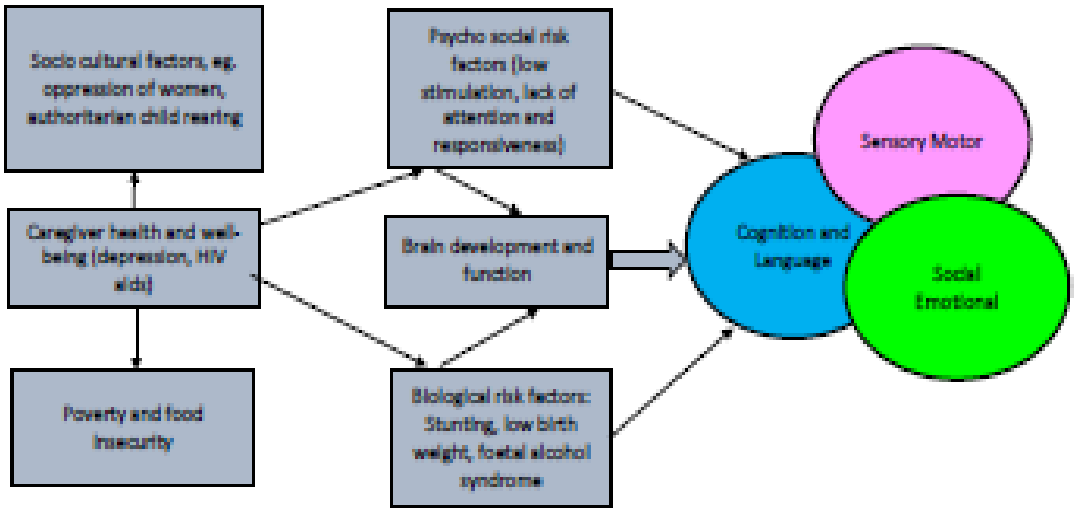

Figure 2.1: Risk factors impacting ECD in South Africa (Biersteker, 2012, p.52)

2.2.1 Contextualising ECD in the South African context

The National Department of Education defines ECD as "*The processes by which children from birth to nine years of age grow and thrive physically, mentally, emotionally, morally and socially" (*DoE, 2001, p.10). This statement conveys the importance of an integrated approach towards ECD as it considers a learner's health, education, psycho-social, nutrition, and environmental influences within the context of the family and community (DoE, 2001).

Poverty and inequality have a negative impact on many people in urban and rural communities in South Africa. In this regard, Hall and Sambu (2014) state that insufficient income can compromise children's rights to education, nutrition, suitable living environments and basic healthcare. South Africa has a high rate of child poverty, with Statistics South Africa (StatsSA, 2015) indicating that 56% of children lived below the poverty line (R635 per month)[7] in 2012. However, income poverty rates have consistently decreased since 2003 (Atmore et al. 2013).

The South African Government recognises the importance of ECD and has over recent years introduced different kinds of developmental services with the aim of addressing

[7] R635.00 = approximately USD 45.00 per month.

the rights and needs of all learners (Biersteker, 2010b). In 2012, a *Diagnostic Review of Early Childhood Development* was conducted under the *National Evaluation Plan,* which formed the foundation for the efforts presently underway to develop both a national ECD policy and a national ECD programme. Reaching this goal may ensure an integrated approach to providing all learners with an equal chance to start well when entering formal schooling, especially those who face challenges on multiple levels (Atmore, Van Niekerk, & Ashley-Cooper, 2012; Biersteker, Dawes, Lake, & Smith, 2013; Richter et al. 2012).

Furthermore, the Department of Education's (DoE, 2011b) aim has been to make the reception year (Grade R) compulsory for all children by the year 2014, thereby emphasising the importance of formal education in that year. However, although access to educational and early learning opportunities have increased significantly over recent years, and progressive policy has subsequently been formulated by a range of role-players, the academic achievement of learners in the foundation phase of the public school system is not yet up to standard, and requires ongoing attention (Biersteker, 2010a). It follows that continued research and efforts are required in support of quality teaching and learning, in the early and later stages of schooling (Biersteker, 2010b).

2.2.2 ECD as the foundation for performance later in life

On a worldwide scale, increased evidence can be found on the negative effects of learners not being sufficiently prepared for formal schooling, and the resultant importance of early intervention to address developmental disparities (Bierman & Boivin, 2014). In this regard, international research shows that the early years are crucial for the development of the social, emotional, cognitive and physical well-being of learners (Bierman & Boivin, 2014). Current research (Bennet, 2012; Bierman & Boivin, 2014; Britto, Yoshikawa, & Boller, 2011; Bruce, 2010) provides insight into how an early disadvantage can delay learning and how disparities may be reversed with effective early education and intervention.

Investment in ECD has economic benefits, not only in terms of the recipients being educated, but also for the ECD workforce who are trained and supported (Atmore et al. 2013). To effectively diminish the impact of early disadvantage and advance the

school readiness of learners from resourced-constrained areas, however, requires an understanding of the various domains of human development (Cote et al. 2014), as any early stimulation a child receives, needs to be suitable in terms of the learner's developmental level at that stage (Bierman & Boivin, 2014).

De Witt and Booysen (2007, p.1) describe the development of a child as "*the gradual, observable changes in, or unfolding of, the child in totality, who is en-route to proper adulthood".* In the following subsections, I foreground the importance of optimal child development (in terms of the various domains of development) for the performance of learners. Even though I specifically focus on physical and perceptual development as this concerns the focus of my study, I also briefly discuss the other domains as all of these will contribute to the holistic development and performance of a child.

2.2.2.1 Physical development of pre-school children

Physical well-being and motor development encompass the characteristics, skills and abilities of a learner's physical health and overall wellbeing which includes self-help, fitness, gross motor skills, fine motor abilities, graphomotor and sensorimotor capacities (Cappeloni, 2013). Changes in physical development are rapid in the early years, with later knowledge, skills and abilities building on already acquired skills (Bredekamp, 2011).

Of all the aspects of child development, the physical aspect is the most observable in young learners and is therefore often used to determine whether or not a child's development is on par according to hishe or her chronological age (Berk, 2001; Louw & Louw, 2007). During the course of life, movement serves as an important medium through which information obtained from the senses is integrated, and knowledge of the world can be communicated (De Jager, 2009; Goddard-Blythe, 2011). Thought and perception are also seen as internalised simulation of action.

From the age of two to six, epiphyses emerge in various parts of the skeleton where cartilage hardens into bone (Louw & Louw, 2007). Several factors can promote muscle and bone growth. For example, daily activities such as running, jumping, lifting, carrying and handling of objects will generally develop and strengthen muscle and

bones (Berk, 2001; Louw & Louw, 2007). By the end of the pre-school years children also start to lose their primary teeth (Berk, 2001).

Brain development forms an important part of physical development. During the early childhood years, brain development occurs rapidly and by the age of five the brain has reached almost 90% of its adult weight (Louw & Louw, 2007). The brain is an extra-ordinary organ that regulates the activities of other systems in the body, senses information in the environment, and guides a child's movement. It forms associations between environmental stimuli and mental concepts, fills experiences with emotional meaning, translates thoughts into words and behaviour, and determines the actions required to achieve outcomes (Mc Devitt & Ormrod, 2013). In section 2.2.2.2, the cognitive development, abilities and skills of pre-school children are discussed in more detail.

The brain is organised into three main parts – namely the hindbrain, midbrain and forebrain (De Witt, 2016). The hindbrain consists of the medulla (medulla oblongata or extended spinal cord), pons and cerebellum (De Witt, 2016). The medulla acts as the reflex centre for life processes such as breathing, control of the heartbeat, blood pressure and skeletal muscle tone (De Witt, 2016; Kail, 2012; Mc Devitt & Ormrod, 2013). The pons, which is also part of the hind brain, contains many structures that are found in the medulla, such as the sensory and motor nerve tracts. The pons fulfils a central role in motor behaviour (De Witt, 2016), with the coordination of muscle movement being the main function of the cerebellum. According to De Witt (2016), this is made possible when a person receives information *via* input (e.g. sensory information) with the midbrain (mesencephalon) as a result connecting the hindbrain to the forebrain in order to coordinate communication between the hindbrain and forebrain (Kail, 2012; Mc Devitt & Ormrod, 2013).

The forebrain (prosencenphalon) is the largest of the three parts of the brain and occupies the upper part of the skull. The most important areas of the forebrain are the thalamus, hypothalamus and cerebrum, which includes the cerebral cortex (Berk, 2013; De Witt, 2016; Kail, 2012; McDevitt & Ormrod, 2013). The forebrain produces complex thinking, emotional responses and the driving forces of motivation. The forebrain, furthermore, has special significance as it allows children to learn and develop individual personalities (McDevitt & Ormrod, 2013). The cerebrum is the

largest part of the brain and consists of the left and right cerebral hemispheres, each with its own specialised functions. The left hemisphere controls the right side of the body, and the right hemisphere the left side (De Witt, 2016). Talking, understanding speech, reading, writing, mathematical problem-solving and computer programming, are all beneficiaries of left hemisphere processing (McDevitt & Ormrod, 2013), while the right hemisphere usually excels in synthesis, or integrating information into a coherent unit.

As stated, the brain and central nervous system develop rapidly during the pre-school years. The vast development of the cerebral cortex may explain why pre-school children are able to easily absorb new information and start participating in problem-solving activities (De Witt, 2016). As such, I was able to conduct my study under the assumption that pre-school children are open to learn and may benefit from focused interventions such as the one that forms part of this study. In the following subsections I discuss physical development in the pre-school years with specific focus on motor development, perceptual development and perceptual skills development.

2.2.2.1.1 Motor development

Berk (2013) describes motor development as central nervous system development, which implies body-movement capabilities. As movements are typically repeated thousands of times, new connections in the brain are promoted and motor patterns can be governed. By the age of six, learners begin to integrate movements when they arrive at a point where they can cognitively think about coordinating two or more movements such as running and throwing a ball or swinging a rope and jumping over it (Berk, 2013; Charlesworth, 2008).

The primary motor development area of the cortex is located in the frontal lobe of the brain. This part of the brain is associated with the finer movements of muscles in the body (Bruce, 2010). Motor skills, which improve at a vast tempo in the pre-school years, can be divided into two categories; namely, fine and gross motor skills. Gross motor skills comprise the use of large muscles for activities such as running and climbing. The development of gross motor skills imply strong muscles, physical coordination and balance (Bruce, 2010). On the other hand, fine motor skills entail the use of the small muscles in the hands and fingers for activities such as painting, cutting

and drawing. It follows that improved coordination of small motor muscles and dexterity will enable learners to draw more accurately and to start writing (Louw & Louw, 2007).

Gallahue, Ozmun, and Goodway (2012) distinguish between different phases of motor development. According to these authors (Gallahue et al. 2012), movement can be grouped into three functional categories based on different purposes. These phases relate to stabilising movement tasks, where the body remains in place but moves around its horizontal or vertical axis; this enables balancing, dodging, starting and stopping. In loco motor movement tasks where the body proceeds in a vertical or horizontal direction from one place to another, walking, running, leaping or jumping are the common activities. In manipulative movement tasks the body gives or receives force from objects such as when throwing, catching and kicking a ball (Bredekamp, 2011; Gallahue et al. 2012).

Gross motor play forms an important part of the pre-school years, when children rely on physical activity to maintain focus and on-task behaviour during more structured parts of the school day (Bredekamp, 2011). Gross motor skills development precedes fine motor skills development as larger muscles develop earlier and more rapidly than finer muscles (De Witt, 2016). However, young children still make strides in fine motor skills development. When given drawing tools, many children will begin to scribble by the age of two, and gradually master the skills of drawing circles, or mandalas which are circle shapes with crosses dividing the centre space (Berk, 2013; Charlesworth, 2008; McDevitt & Ormrod, 2013). According to Davin and Van Staden (2005), three stages of development can be seen in children's drawings; namely, the scribbling stage, pre-schematic stage (3-4 years) and schematic stage (5-9 years).

During the schematic stage, children's own individual symbols or patterns for objects such as humans, houses, and trees will develop after experimenting in the previous stages. Another characteristic of this stage is that children will start to arrange objects in pictures on a base line. They start understanding the use of space on a piece of paper, and will begin to use colour in a realistic way (e.g. green for grass, and blue for the sky). Figure 2.2 provides an example of a drawing by a child in the schematic stage (Charlesworth, 2008; Davin & Van Staden, 2005).

Figure 2.2: Schematic stage of drawing (Novic Djokovic Foundation, 2015)

Fine motor development forms the basis for mastering writing skills (Charlesworth, 2008). According to Charlesworth (2008), eye-hand coordination, small muscle development, the ability to hold a writing tool, the ability to make basic strokes, orientation to printed language and letter perception, are pre-requisite skills for writing. Before learners can use a writing tool they must have control over their small muscles; in other words, be able to control their wrist and finger muscles. This can be promoted by making use of activities involving manipulative materials like jigsaw puzzles, construction toys, small toys, and moulding material such as clay, sand and play dough. Buttoning, zipping, using scissors, crayons and other art materials can further promote the development of finger dexterity (Charlesworth, 2008). Once small muscle skills have been developed, children can coordinate eye and hand movements and thus handwriting can occur.

Applying these possibilities to my study, I focused on the inclusion of activities in the intervention I developed that could strengthen fine and gross motor skills. For this purpose, I relied on skills such as cutting, pasting, painting, threading, and drawing to improve fine motor development, and on skills such as running, jumping, and hopping to improve gross motor development. Furthermore, gross motor skills are important as they play a vital role in the time-space integration of different parts of the body, together and individually. The fine motor skills are necessary to control the smaller muscles of

the body, primarily the eyes and hands in order to accomplish academic tasks when entering formal schooling (De Witt, 2016).

2.2.2.1.2 Perceptual development

Perception implies the ability of the brain to make contact with the surrounding world by means of sensory organs. It involves the brain's control of information that reaches the nervous system *via* the sensory organs, and its processing of and ultimately reaction to such information (De Witt & Booysen, 2007). De Jager (2009, p.10) states that "*once the mechanical parts work well together, information needs to flow along the connective wiring*". Therefore, cognitive development (Section 2.2.2.2) and perception are integrated and support one another (Van Zyl, 2004). According to Gallehue and Ozmun (2006), the development of perceptual abilities may significantly inhibit or enhance a child's movement abilities.

It follows that perceptual development implies a fundamental process during which a child learns to see, move and hear in various stages and ways. From birth, children learn through their basic senses. The brain processes the information obtained through the five basic senses of hearing, vision, touch, smell and taste (Gallehue & Ozmun, 2006). These senses play a primary role in the outcome of the different perceptual modalities (De Witt, 2016) as perception in essence means *"to know"* or to *"interpret"* information (Gallehue & Ozmun, 2006, p.267) when organising incoming information within stored information, resulting in a modified response pattern.

Visual perception refers to the brain's ability to make contact with the world through vision and to thus identify a visual stimulus, and to organise and interpret this. About 80% of all information received by human beings is gathered through the visual sense (Dednam, 2005). Similarly, auditory perception involves the interpretation of information that is transferred to the brain *via* the ears. Various sub-categories exist for both modalities; namely, visual and auditory discrimination, memory, comprehension, shape recognition, foreground/background differentiation, and motor integration. Table 2.1 and Table 2.2 provide a summary of the sub-categories of visual and auditory perception.

Table 2.1: Sub-categories of visual perception (Berk, 2013; De Witt, 2016)

Sub-categories of visual perception	Description
Visual discrimination	The ability of the brain to recognise visual differences and similarities; to enable the child to differentiate between symbols and words.
Visual memory	The brain's ability to remember what the eyes have seen.
Visual comprehension	The brain's ability to form concepts after the eyes have seen something. Important for abstract thinking, problem-solving and drawing conclusions.
Shape recognition	The ability to distinguish between shapes and symbols, irrespective of the size and position of the objects.
Foreground/background perception	The ability to differentiate between objects in the foreground and those in the background when looking at them.
Visual motor-integration	The ability of the child to execute movements with the body, since movements are normally led by the eyes.
Depth perception	The ability to judge the distance between objects that are seen, and to guide motor activity.
Pattern perception	The sensitivity of vision to the contrast between different patterns that are seen.
Object perception	The ability to display size and shape consistency.

Table 2.2: Sub-categories of auditory perception (Berk, 2103; De Witt, 2016)

Sub-categories of auditory perception	Description
Auditory discrimination	The ability of the brain to differentiate between different sounds based on their quality and intensity.
Auditory memory	The brain's ability to remember what has been heard.
Auditory comprehension	The ability to arrive at abstract thought *via* the ears.
Auditory foreground/background discrimination	The ability to differentiate between sounds in the foreground and those in the background.

For olfactory perception (smell), information is sent to the brain *via* the nose or sense of smell. Gustatory perception (taste) involves the ability to distinguish between different tastes *via* the tongue or sense of taste, and tactile perception (touch) relates to the perception and interpretation of information that is sent to the brain *via* the skin,

fingertips or sense of touch. For the purpose of this study and the development of the perceptual-motor intervention, I focused on visual and auditory perception skills due to the results of the pre-intervention assessment I completed. These areas showed the lowest scores pre-intervention, resulting in the focus of activities in these areas in the perceptual-motor intervention I developed. As perception is related to the processes of learning, cognition and language, a child who experiences problems in perception will typically also experience difficulty in other areas of learning (Berk, 2013; Bredekamp, 2011; Erasmus, 2012; McDevitt & Ormrod, 2013).

2.2.2.1.3 Perceptual-motor skills development

Gallehue and Ozmun (2006) explain perceptual-motor development in terms of the dependency of voluntary movement on some form of perceptual information. According to these authors, voluntary movement involves an element of perceptual awareness that stems from sensory stimulation. As such, the development of perceptual abilities is seen as dependent on motor activity (Gallehue & Ozmun, 2006).

Young learners need to establish a broad base of motor experience in order for higher learning skills to develop sufficiently (De Witt, 2016). As Goddard-Blythe (2011, p.18) puts it: *"Learning is not all in the mind but is also a physical activity"*. A learner's motor abilities can therefore be seen as vital tools for learning. It follows that motor skills at different stages of development will provide an insight of maturity regarding the functioning of the central nervous system or the link between the brain and body, higher cognitive functioning, which can in turn provide a foundation for learning (De Jager, 2014; De Witt, 2016; Doherty & Hughes, 2014; Goddard-Blythe, 2011). Table 2.3 provides an overview of the perceptual-motor skills required by children, in order for them to be ready for formal schooling.

Table 2.3: Perceptual-motor skills associated with school readiness (De Witt, 2016; Erasmus, 2013; Mohamed, 2013)

Perceptual-motor skill	Description
Body awareness	The ability to distinguish between different parts of the body; an inner awareness of the position of body parts. Involves the recognition, identification and differentiation of body parts, dimensions, position, movement and spatial location of the body.
Spatial awareness	Awareness of which space is occupied by the body; the ability to manipulate the body in a given space.
Laterality	Awareness that the body has two sides, that there are differences between these and that the limbs on each side of the body function independently. Dominance and directional awareness develop from laterality.
Dominance	Preference is given to one side of the body.
Directional awareness	The ability to identify the concepts “right/left”, “top/bottom”, “front/back”, “behind/in front of” in space in relation to the self.
Time concept	Dependent on the inter-relationship between different nervous systems and sensory modalities.
Midline crossing	The ability of one side of the body to cross over to the other side, by moving across the midline of the body. Body image and laterality form the basis of midline crossing.
Eye movements	Moving the eye from left to right, and up and down, as well as being able to focus the eye.
Eye-hand-coordination	The ability to perform movements with the hands and feet as guided by the eyes. Involves the interactional control of both the eyes and hands, whilst at the same time using eye movements to optimise vision.
Gross motor movements	Effective use of the whole body in gross motor or cross motor movement of different parts of the body, such as running, bouncing, jumping, throwing, catching, hitting and balancing.
Fine motor skills	Controlling the small muscles of the body such as the eyes and hands to accomplish academic tasks such as writing.

During the pre-school years, the senses of sight, smell, touch, taste and hearing develop (Bredekamp, 2011). As learners’ ability improve to simultaneously take in sensory input and make modifications to their motor movement, so does motor coordination, balance and timing. Learners will as a result be able to increasingly integrate previously acquired skills into more complex actions, especially in cases where they practise these skills. As learners gain perceptual-motor skills, they develop

and their body awareness increases, thus teachers can intensify challenges and the level of difficulty of tasks (Bredekamp, 2011; De Jager, 2014; Erasmus, 2012).

Perceptual-motor activities are regarded as important contributors to the general readiness of learners for learning (Gallehue & Ozmun, 2006). In this study, I conducted a school readiness assessment activity with Grade R learners from resource-constrained environments and then implemented a perceptual-motor intervention programme with them, focusing on the areas of perceptual development that were identified as below the expected level of development. Following the pre-intervention assessment, I thus designed the perceptual-motor intervention programme by specifically focusing on the application of the senses to get information to the brain, resulting in the child either making use of fine or gross motor skills. The perceptual-motor intervention was specifically designed to enrich the current Grade R curriculum. It follows that this intervention programme can potentially contribute to the knowledge base on learners' school readiness, and may support the preparation of Grade R learners to become ready for formal schooling and associated learning activities.

2.2.2.1 Cognitive development of pre-school children

One of the most important aspects that relate to physical development during the early childhood phase is the development of the brain (Kail, 2012; Louw & Louw, 2007). As the myelinisation and synaptic pruning of neural fibres take place, pre-school children acquire a variety of skills associated with physical coordination, attention, perception, language, memory, logical thinking and imagination (Berk, 2001; De Witt, 2016). In addition to inherited potential, healthy brain development largely depends on the environment and conditions preceding birth, and during the first 24 months of a child's life (Gabbard & Rodriques, 2013). To this end, Gabbard and Rodriques (2013) state that precision in the mature brain can only be achieved when stimulation is provided in the form of movement and sensory experiences during the early developing years of a child's life.

Cognition encompasses all mental activities that human beings engage in, such as perception, categorisation, understanding, memory, logical reasoning and problem solving (Berk, 2013; Mc Devitt & Ormrod, 2013). As such cognitive development implies the development of motor skills, perceptual memory and linguistic ability as

well as intelligence (De Witt & Booysen, 2007). Cognitive development to an extent depends on physiological maturation due to the brain undergoing a series of genetically controlled changes as a child grows up, however environmental events also play a crucial role in fostering a child's cognitive capabilities (McDevitt & Ormrod, 2013).

Jean Piaget (1896-1980) distinguishes between the following four stages of cognitive development: the sensori-motor stage, pre-operational stage, concrete operational and formal operational stage (Langston & Abbot, 2010). The sensori-motor stage is the period from birth to two years and is characterised by an infant's knowledge of the world, based on the senses and motor skills. This stage allows for a first understanding of the world when a young child assimilates information from the environment into a limited set of schemas she or he had been born with (Doherty & Hughes, 2014). As children in this age range typically possess limited language abilities, sight and touch are vital senses used to gather information from the environment (Doherty & Hughes, 2014; Mooney, 2013; Neaum, 2013).

The pre-operational phase or pre-conceptual period spans from two to six years. During this period, children learn how to use symbols such as words and numbers in order to represent aspects of the world. These representations will generally relate to the world as perceived by the child. During the pre-operational stage, children thus gather information from what they experience rather than from what they are told (Doherty & Hughes, 2014; Mooney, 2013). They are generally comfortable with their own way of reasoning during this period, even though this may not necessarily be logical. It is only after a child gains experience, that mental processes will challenge the child's world view. Piaget calls this state the state of *"disequilibrium"* (Mooney, 2013, p.87). In response, once a learner has changed hishe or her view and adapted new information, *"accommodation"* takes place, resulting in a more balanced and comfortable state of *"equilibrium".* Due to the focus of my study, the pre-operational stage was central in the investigation and my development of the perceptual-motor intervention.

The concrete operational phase is situated in the age group, seven to eleven, and is characterised by a child's ability to understand and apply logical operations to

experiences, on condition that that these are focused on the *here* and *now*. Finally, the formal operational phase occurs from adolescence to adulthood, and is marked by the development of abilities to abstract thinking, speculations on hypothetical situations, and deduction of reasons about what may be possible (Doherty & Hughes, 2014).

Piaget's work has distinct implications for learning, which requires the active construction of knowledge when learners engage with the school environment. Discovery-learning can promote knowledge-construction as this requires learners to build up schemes, and may encourage accommodation and assimilation. In such a learning situation the teacher's role is to facilitate, assist learners to discover, question and speculate. Similarly, schools and school curricula are expected to allow for appropriate learning experiences that may foster cognitive development and promote a natural desire to learn (Doherty & Hughes, 2014).

2.2.2.3 Social development of pre-school children

Social development involves the development of both social skills and the need for human contact and interaction (De Witt, 2016). The pre-school years are marked by accelerated growth in children's interactions with peers, with children increasingly initiating and establishing friendships with at least one other child (Bredekamp, 2011). According to Bredenkamp (2011), such relationships will in turn contribute to cognitive and language development, and to the overall well-being of the young child.

Piaget (1953) views play as a form of social interaction that allows for assimilation and adaptation to take place. As such, interaction between children is seen as important for cognitive development as it will result in the pre-school child moving away from an egocentric view of incidents. Closely aligned, Vygotsky (1978) regards social constructivism as a way of social interaction that forms a pivotal part of children's learning, along with a personal critical-thinking process (Charlesworth, 2008; Powell & Kalina, 2008). Naude (2014) discusses Vygotsky's theory and states that learning takes place on three levels according to this model. Firstly, learning can occur when children interact with other people in the environment with the aim of acquiring knowledge on a phenomenon. Secondly, learning can occur when a child interacts with a more knowledgeable person such as a teacher or older sibling; and lastly,

learning can take place between two borders. Naude (2014) called this the zone of proximal development (ZPD).

Vygotsky's (1978) theory of development indicated that language aspects are seen as components of social constructivism. The ZPD forms an integral part of Vygotsky's theory and learners are said to acquire knowledge and skills easily when in this zone especially when others are invloved. Naude (2014) agrees that, from a Vygotskyan point of view, knowledge acquisition cannot take place in isolation but is seen as an act of knowledge-sharing between learners and teachers. Guidance from an adult or teacher should include assisting a learner to think logically and discover answers to problems. Scaffolding is regarded as an assisted-learning process that supports the ZPD (or getting to the next level of understanding), with assistance from teachers, peers or other adults (Powell & Kalina, 2008).

In summary, social development is a process whereby children acquire the beliefs, customs, attitudes, values and roles of their social group in order to be integrated and accepted by society. Appropriate social behaviour implies pro-social behaviour in terms of abilities related to empathy, sharing, caring, gender-role behaviour, emotional control and moral behaviour (Louw & Louw, 2007). Therefore, by providing opportunities where learners can interact with one another in small groups in the classroom and where the teacher provides guidance and facilitates learning, children may come up with solutions to problems, and as a result construct knowledge.

2.2.2.4 Emotional development of pre-school children

The well-known Danish psychologist, Erikson (1963)[8] divides the emotional development of the young child (0-6 years) into the following phases: development of basic trust *versus* mistrust (0-1 years), development of autonomy *versus* doubt and shame (1-2 years), and lastly, development of initiative *versus* guilt (purposefulness). In the first phase, trust *versus* mistrust, the infant depends completely on adults to attend to his or her basic needs, such as food, clothes, safety and shelter. If the infant's needs are adequately met by the caregiver, secure attachments are formed. If the

[8] I acknowledge that this is a dated source yet relied on it as primary source on Erikson's theory.

infant's basic needs are, however poorly taken care of, a more pessimistic, distrusting personality may result (Weiten, 2016).

The second phase of emotional development entails the development of autonomy *versus* doubt and shame. During this phase toddlers aim to exercise and develop their newfound muscle control, resulting in them acquiring a sense of autonomy (specifically when a child performs actions correctly), or a sense of shame and doubt in the own abilities especially when actions are performed unsuccessfully (De Witt, 2016). Parents are required to support their children's emerging independence while maintaining appropriate control and also protecting them from unnecessary failure and feelings of doubt (Weiten, 2016).

During the third phase, for development of initiative *versus* guilt, the pre-school child develops self-worth and a sense of personal mastery in the process of conquering the world around him or her. Erikson (1963) states that the pre-school child's most important task is to display initiative and avoid guilt. As a result of greater movement abilities at this stage, the child may often find himself/herself in unfamiliar situations where rules are broken. This may leave the child with a sense of doubt and guilt. As such, the support of an adult or educator at this stage will cultivate and foster purposefulness and initiativeness (in the child) in order to convince him or her of the type of person she or he the may develop into (De Witt, 2016).

Emotional development implies complex processes around the age of two to three, when children start experiencing more complex emotions such as embarrassment, shame, guilt, pride and jealousy – the so-called "*conscious emotions"* (Doherty & Hughes, 2014, p.331). During the following years, pre-school children generally become more capable of regulating their own emotions. They can as a result then wait for a turn, and can start showing patience at this stage (Bredekamp, 2011). Pre-school children are also able to associate emotions with words and facial expressions and can use pretend-play to understand and respond to emotions. As a result, they may experience positive growth in self-concept and self-esteem development. To this end, a sound emotional infrastructure (for example having a parent or caregiver who is emotionally available and who can supply support, guidance and nurturing) can form

a firm foundation for a child's future development as a person which is key to social and emotional readiness for school (Pitcl & Provance, 2006).

Barton et al. (2014) as well as Salkind (2008) claim that emotional development is linked to both cognitive development and social experience. According to Heller, Rice, Booth, Sidell, Vaughn, Keyes & Nagle (2012), emotional competence can be seen as an important component of school readiness, with emotional readiness observable in aspects such as confidence, attentiveness, friendliness, suitable language skills, the ability to relate with peers without being too submissive or over-bearing, the ability to form meaningful relationships with teachers, being persistent at challenging tasks, the willingness to give and receive support, the ability to communicate in a respectful way, and the ability to follow instructions. Such characteristics can be acquired through mechanisms such as observation, following direct instructions, and adhering to disciplinary measures implemented by parents, siblings, peers, the media, schools and day-care centres, as part of the socialisation process (Louw & Louw, 2007; Berk, 2001).

2.2.2.5 Moral-normative development of pre-school children

According to De Witt (2016), no child is born with a sense of right and wrong, yet any child has the potential to evaluate and learn how to handle ethical, moral and religious dilemmas. Louw and Louw (2007) define moral development as a set of principles or ideas which enable individuals to differentiate between right and wrong. Salkind (2008) similarly relates the word *"moral"* to human conduct and thinking, as embedded in Kohlberg's (1975) stage theory of moral development.

Kohlberg (1975)[9] states that moral reasoning can be assessed in terms of an individual's ability to deliberate aspects associated with fairness and justice, and to even out the wants of the self and the larger society (Doherty & Hughes, 2014). Kohlberg identifies three levels and six stages of moral development (two stages per level) that are relative to justice structures (Muthukrishna & Govender, 2011). These stages of moral development are of specific importance to Grade R learners as learners generally act as moral beings in search of the truth in terms of right and wrong.

[9] I acknowledge that this is a dated source yet relied on it as primary source on Kohlberg's theory.

This implies that children will typically respond to rules and submit to authority. They will obey rules to avoid punishment. Moral understandings are thus built from learners' experiences during various social encounters.

Kohlberg's (1975) first level of moral development is referred to as pre-conventional morality and involves the stages of obedience and punishment orientation, and hedonistic and instrumental orientation. During the obedience and punishment stage, children are seen as able to make moral decisions on the basis of self-interest, and will disobey rules when they think they can get away with it. During the hedonistic and instrumental orientation stage, children realise that others have needs too, yet still prioritise their own needs over those of others. Most learners up to the age of ten fall in the pre-conventional morality level (Doherty & Hughes, 2014).

Kohlberg's (1975) second level is referred to as conventional morality which involves the stages of "good boy/good girl", and law and order. During these two stages children make decisions on the basis of how others may be pleased, and are focused on maintaining friendships. During the law and order stage, children will typically look to society as a whole for guidelines about moral decisions. At this stage, they will view rules as absolute, inflexible and things that cannot be changed. The last level is described as post-conventional morality, and comprises stages of social contract, and universal ethical principles (Doherty & Hughes, 2014; McDevitt & Ormrod, 2013).

Kohlberg's theory (1975) is in line with Piaget's view (1953) that moral reasoning implies a cognitive process and that learners form ways of thinking through experiences, including moral concepts (Doherty & Hughes, 2014). In this regard, Louw and Louw (2007) believe that every child should learn how to experience and deal with negative emotions when rules are broken, control their impulses and avoid prohibited behaviour.

2.3 SCHOOL READINESS

Quality early learning experiences can support children to become ready for formal schooling (Van Zyl, 2012). Green, Parker, Deacon and Hall (2011) agree that quality learning opportunities in the early years will have a substantial bearing on children's development and future school careers, particularly in the case of children residing in

resource-constrained contexts. According to Landsberg, Kruger and Nel (2011), a substantial number of learners, however, do not reach the required level of school readiness before entering Grade 1, due to factors such as insufficient learning experiences at home and/or limited access to quality early-learning programmes.

The levels of school readiness required to succeed academically in later school years have been the focus of developmental and educational studies for many years (Excell & Linington, 2011). However, limited research exists in the field of perceptual-motor development and its relation to school readiness and the quality of training and development of Grade R teachers in terms of perceptual-motor development and the integration of perceptual-motor activities into the daily lesson plan. In South Africa, this could be as a result of the current Grade R CAPS[10] curriculum being treated as a watered down Grade 1 curriculum where focus falls on Language and Mathematics, which is taught by means of semi-concrete activities (Grade R workbooks and worksheets). Although Grade R forms part of the Foundation Phase (Grade R-3) in South Africa, it cannot be treated in the same light as Grade 1.

As such, my study can contribute to existing literature on the relation between school readiness and perceptual-motor development, with specific focus on the school readiness of Grade R learners from resource-constrained settings. Furthermore, my study may also potentially provide insight into Grade R teachers' understanding and perceptions of perceptual-motor development, school readiness and the relation between school readiness and perceptual-motor development.

2.3.1 What does school readiness entail?

Broadly speaking, school readiness refers to a child's total preparedness to benefit from formal education in a group context. Cappeloni (2013) states that school readiness can be seen as a broad concept that incorporate all facets of a child's life that may contribute to the ability to learn. Definitions of readiness thus imply consideration of the environment, context and conditions under which a child acquires skills and is encouraged to learn. School readiness implies the following dimensions: a child's readiness for school, the school's readiness for the child, and the family's and

[10] Curriculum Assessment Policy Standards (CAPS, 2011).

community's readiness for school (Britto, 2012; High, 2008; McGettigan & Gray, 2012). School readiness is thus firstly determined by the learning readiness of the child, encompassing a child's physical, emotional and social development. This includes a child's approach to learning, including aspects such as enthusiasm, curiosity, temperament, culture and values which promotes the child's language development; as well as his or her general knowledge and cognition. The second dimension of school readiness relates to the schools' readiness for children (High, 2008) which should ensure a smooth transition between home and school. The final aspect concerns family and community support (the home environment) which may once again contribute to a child's readiness for school (High, 2008).

McGettigan and Gray (2012) propose that the primary mechanisms through which children can acquire school readiness competencies are social relationships with parents, teachers and peers. Moreover, these authors also highlight the important role of the environment (McGettigan & Gray, 2012). Similarly, in a study by UNICEF (Britto, 2012), the link between the child and the environment is emphasised, indicating that the environment can support and promote development. School readiness can thus be enhanced by a child's environment and the role that teachers fulfil in preparing the child (Bredekamp, 2011; De Witt, 2016). A child who functions in a stimulating educational setting, where favourable circumstances are being created for learning, can be prepared for formal schooling in a systematic and gradual manner (De Jager, 2012, 2014; De Witt, 2016). It follows that school readiness can subsequently also be linked to academic achievement in reading, spelling and mathematics in Grade 1 (Mohamed, 2013).

De Witt (2016) identifies general criteria for determining a child's readiness for school. These are summarised in Table 2.4.

Table 2.4: General guidelines for determining school readiness (De Witt, 2016)

Physical readiness	Are movements coordinated, comfortable and fluent? Can the child stand on one leg for at least five seconds? Can the child walk in a straight line? Can the child catch and throw a ball? Can the child sprint, hop and do a somersault?
Cognitive readiness	Is the child able to count? Is the child able to recognise and copy shapes? Does the child understand the principle of cause and effect? Can the child do basic addition and subtraction? Can the child perceive similarities and differences? Can the child distinguish between foreground and background? Can the child estimate, plan and evaluate? Does the child have an understanding of symbols? Is the child able to solve problems?
Social readiness	Is the child able to socialise with others and establish relationships? Is the child less involved with himself/herself (less egocentric)? Is the child able to share? Does the child play with others? Are there indications of a positive self-image? Can the child start detaching from the parents?
Emotional readiness	Does the child venture in and explore the world? Does the child ask questions and expects to be answered? Can the child make choices? Is the child overly dependent? Is the child confident? Can the child express hishe or her feelings?
Moral readiness	Does the child accept authority? Can the child distinguish between proper and improper? Does the child know the concepts of *please, thank you* and *sorry*? Does the child fit in easily with routines? Does the child respect the rights of others? Can the child obey simple rules and regulations?

2.3.2 Importance of perceptual-motor skills development for school readiness

Perceptual-motor skills can add to a variety of basic learning skills associated with academic success (Pienaar, et al. 2014). In a study by Van Zyl (2004) on the relation between perceptual development and scholastic performance of Grade 1 learners, sensory integration is indicated as the basis of all perceptual modalities. Mohamed (2013) similarly states that important concepts will develop from perceptual processes, necessary for language, cognitive development and the adaptive skills required for daily living. Mohamed (2013) furthermore proposes that different developmental areas will work together by contributing and developing in a joint way.

Even though perceptual development starts at birth, it is during the pre-school years that play and structured activities can accelerate development in this area. More specifically, a child can acquire basic information required for school entry through the development of perceptual experiences (Mohamed, 2013). In the study of Pienaar et al. (2014) with first grade learners from a resource-constrained school-setting, a strong relationship existed between perceptual-motor skills and early school accomplishment in critical school performance areas such as mathematics, reading and writing. According to these authors, perceptual-motor abilities can be considered as building blocks for academic success in the basic learning areas.

Van Zyl (2004) summarises the relation between the senses, sensory integration, perception and school success in five steps. The first step involves the senses and information received from the environment, in the auditory, vestibular (gravity and movement), proprioception (muscles and joints), tactile and visual domains. The second step, which builds on the information received during the first step, entails eye movement, posture, balance and muscle-tone. The third step consists of body perception, laterality, motor planning, attention span and emotional stability. Step four comprises speech and language development, eye-hand coordination and visual perception; and finally the fifth step is seen as the end product or output based on the development of the senses and sensory integration that had taken place during the first four steps. This will determine the ability to concentrate and organise which will foster self-control, self-esteem, self-confidence, dominance, academic learning ability (cognitive processes), and the capability of abstract thought and reasoning.

According to Gallehue and Ozmun (2006), at the time when children are ready, they should have sufficiently developed their basic perceptual and conceptual learning capabilities. Therefore, perceptual readiness for learning can be seen as implying a developmental process where perceptual-motor activities play an important role. The greatest perceptual-motor development takes place between the ages of three and seven, which are viewed as the crucial years when children also start to read. A child is viewed as perceptually ready to read when she or he has acquired a sufficient base of information to encode and decode sensory impressions (Gallehue & Ozmun, 2006). Against the background of this discussion, I paid special attention to the design of activities where perceptual-motor skills necessary for academic success were emphasised which formed the focus of the intervention I implemented with Grade R children. I focused on concrete activities and repeated these activities for the duration of the eight weeks. In this way, my study has the potential of making a contribution in the field of school readiness, perceptual-motor development, and the relation between school readiness and perceptual-motor development.

2.3.3 School readiness in South African resource-constrained school settings

School-going learners who are raised in resource-constrained environments generally function below average in terms of physical and psychological development, due to the deprivation they face on various levels (Berk, 2013; De Witt, 2016). Deprivation reflects the idea of loss or destitution and implies a lack, shortage or deficiency of the elements required for adequate development (De Witt, 2016). De Witt (2016) explains that low economic status, poor social status, parents' low levels of education, employment in inferior jobs and unemployment, as well as limited social involvement can often be observed in resourced-constrained environments. These symptoms will inevitably shape children's holistic development and their productivity later in life (Neves, 2012).

Early experiences have a fundamental impact on child development. As the education and development of learners in resource-constrained settings is often hampered, they may struggle to cope with the demands of formal education (Atmore et al. 2012; Berk, 2013; Bierman & Boivin, 2014; Moletsane, 2012). Furthermore, the socio-economic backlog experienced by parents in such settings will generally result in them not being

able to provide stimulating learning experiences that are essential to prepare a young child for school (De Witt & Booysen, 2007).

Studies conducted by Biersteker (2010a), Erasmus (2012), Neves (2012) and Van Zyl (2004) indicate that learners from resource-constrained backgrounds tend to have lower levels of school readiness due to the lack of perceptual-motor stimulation in the early years. A study by Jeon, Peterson, Wall, Carta, Luze, Eshbaugh and Swancon (2011) confirms that learners from low-income families are typically less ready for school than their more advantaged peers. These authors found that at school entry level, the average cognitive scores of learners from low socio-economic backgrounds are 60% lower than the average scores of learners from higher socio-economic backgrounds. Isaacs (2012) substantiates by providing a finding from his own research that 48% of the sample of learners from resource-constrained settings were school ready, compared to 75% of learners from moderate to high-income households. Isaacs (2012) also indicates that learners from resource-constrained settings are much more likely than other learners to score low on mathematics and reading assessments.

In addition, Isaacs (2012) states that such poor performance by learners from resourced-constrained backgrounds can be explained in one of two ways. One view focuses on economic differences between families from resource-constrained backgrounds and other families, stipulating that many of the negative outcomes observed among learners and families from poor backgrounds are a product of limited financial resources. The other view focuses on parental characteristics that are often associated with resource-constraints, seeing these as having a harmful effect on learners. In this regard, supportive parenting and a stimulating home environment can be regarded as strong predictors of school performance (Brookes-Gunn & Markman, 2005; Violata, Petrou, Gray, & Redshaw, 2011). Hill and Taylor (2004) also link early childhood experiences to socio-economic status, indicating that stimulating parental involvement will have a positive influence on learners' eventual school performance and functioning. These authors (Hill & Taylor, 2004) believe that parents from higher socio-economic background are typically more involved in their children's schooling than parents from resource-constrained backgrounds, who may face barriers in terms of involvement due to factors such as non-flexible working hours, transport problems, and anxiety due to living in resource-constrained neighbourhoods.

In South Africa many learners enter the formal school system without having attended the Grade R year or a pre-school programme, where attention could have been given to, for example, perceptual-motor development (Pienaar et al. 2013). In addition, Excell and Linington (2011) expose the persistently pervasive approach often followed in Grade R classrooms in South Africa, which may not be the best approach to early teaching and learning. The main focus of the approach often followed is didactic, focusing on table-top activities such as worksheets and workbooks. In response to such practice, I agree with Excell and Linington (2011), who believe that children's learning should follow three phases, where children first experience concepts kinaesthetically (through their bodies and movement), then three-dimensionally (through the exploration of concrete apparatus) and then through pen and paper activities. Based on this proposition, I designed the perceptual-motor intervention programme for this study according to these phases. I furthermore situated my study in existing research, yet aimed to elaborate on what is known about the importance of perceptual-motor skills in preparing learners for formal schooling and the potential effect of perceptual-motor skills intervention programmes, specifically when facilitated with Grade R learners from resource-constrained environments in public schools of South Africa.

2.3.4 Promoting school readiness through structured interventions

In a report compiled by The University of Stellenbosch on the *Impact of the Introduction of Grade R learning Outcomes* (Van der Berg, Girdwood, Shepherd, Van Wyk, Kruger, Viljoen, Ezeobi & Ntaka, 2013) it is concluded that in both developed and developing countries, pre-school interventions can have positive effects, both for short and long term, on a small as well as a universal scale. The report highlights the importance of quality education programmes, and in the case of quality education not forming part of a child's early life, such as in the case of many children in South Africa, structured interventions may thus address some of these limitations.

According to Van der Ven (2008), structured interventions can promote learner development by addressing domains of social, emotional, cognitive and physical development with the intention to promote holistic development, thereby reframing *a "deficit orientation"* to one of positive intervention (Van der Ven, 2008, p.106).

According to Gallehue and Ozmun (2006), perceptual-motor programmes can be effective when viewed as readiness programmes that can assist young children to learn. These programmes can specifically be effective for learners who have been limited or restricted in terms of their experiential background, including their socio-economic environment and possible developmental delays. It follows that such programmes must be developed to specifically include multi-sensory experiences and perceptual-motor activities in order to promote fundamental readiness skills (Gallehue & Ozmun, 2006). In my study, I remained cautious of the potential developmental delays experienced by children in resource-constrained contexts, which was the setting for my study. As such, the programme focused on concrete and multi-sensory experiences during the intervention activities.

It is generally accepted that children from resource-constrained environments can benefit from structured pre-school intervention programmes (Berk, 2001; Halle, Hair, Wandner, & Chien, 2012). In the 1960s the United States of America launched a wide range of intervention programmes for children from resource-constrained environments, for example *Project Head Start* which assumes that learning problems can be best treated before formal schooling begins (Anderson et al. 2003), and that early childhood intervention programmes can prevent or minimise the physical, cognitive, and emotional limitations often experienced by children who are disadvantaged by poverty. In terms of the impact of the *Head Start Project* over the years, Gordon and Browne (2011) cite two significant findings. Firstly, *Head Start* children have been found less likely to be placed in special education classes; and secondly early childhood intervention programmes (such as *Head Start*) can be associated with an increase in Intelligence Quotient and school achievements. The *High/Scope Perry Pre-school Study* similarly provides yet another example of the positive effect that early intervention programmes may have on children's school performance and achievement later in life (Berk, 2009; Gordon & Browne, 2011).

As such, ECD intervention programmes can have a positive effect on children's readiness to learn and may also prevent delays in cognitive development. In addition, evidence of improved academic achievement is indicated by the studies of Anderson et al. (2003), Berk (2001), as well as Bulotsky-Shearer, Wen, Faria, Hahs-Vaughn, and Korfmacher (2012). In this regard, Gallehue and Ozmun (2006) propose that

perceptual-motor intervention programmes should be specifically used in conjunction with traditional classroom techniques in order to enhance basic cognitive functioning.

In another study, conducted by Rossi and Stuart (2007), five to six year old children who encountered barriers to learning and development in language and/or fine-motor co-ordination, showed improvement in various areas such as midline crossing, laterality, directionality, spatial awareness, concentration, handwriting ability and language ability following the implementation of a structured intervention. Similarly, another study by Pienaar, Van Rensburg and Smit (2011) aimed to determine the effect of a *Kinderkinetics* programme, where it was found that the intervention had a positive effect on perceptual-motor development and also contributed to children's school readiness and performance on a cognitive level.

Closely related, Sherry and Draper (2012) contend that all facets of formal learning are based on physical skills and a lack of such skills may lead to poor academic advancement as well as social and behavioural problems. A study by Sherry and Draper (2012) highlights some school readiness deficits in resource-constrained South African settings; however, it indicates how a structured intervention for gross motor skills development may address some of these deficits. It follows that the current study may possibly contribute to existing literature on the relation between school readiness and perceptual-motor development of Grade R learners from resource-constrained backgrounds based on the results obtained after implementation of the perceptual-motor intervention programme.

2.4 FORMAL SCHOOLING IN SOUTH AFRICA

In support of the South African National Curriculum Statement, the Department of Education has identified certain outcomes which guide all teaching and training in South Africa (DoE, 2011). These outcomes are seen as the starting point for reception-year teaching and are broadly divided into two categories, namely critical development, and learning outcomes. Critical developmental outcomes are derived from the *Constitution* and contained in the *South African Qualifications Act (SAQA).* These outcomes describe the kind of citizen that the education and training system aims to produce, namely learners who are able to identify and solve problems, and

make decisions through critical and creative thinking, who can work effectively as individuals as well as team members, also being able to organise and manage him/herself and activities responsibly and effectively (DoE, 2011). This comprises those who can collect, analyse, organise and critically evaluate information. Those who are able to communicate effectively using visual, symbolic and/or language skills in several manners, using science and technology effectively and exhibiting responsibility towards the environment and the health of others, and who can show an understanding of the world as a set of related systems by recognising that problem-solving settings do not exist in isolation (DoE, 2011).

Prescribed learning outcomes on the other hand, have been formulated for different learning areas included in the current South African CAPS school curriculum (DoE, 2011). These learning areas are Languages, Mathematics, Natural Sciences, Technology, Economic and Management sciences, Life Orientation, and Arts and Culture. In the foundation phase (Grades R-3), these learning areas are clustered into three learning programmes: Literacy, Numeracy and Life Skills (DoE, 2011).

2.4.1 Reception year (Grade R)

In South Africa, pre-school education was introduced in the 1930s, however such services were not readily available for the majority of children for many years following the introduction of this option. As a result, most children in South Africa did not have access to any type of pre-school services up to the early 2000s (Ebrahim, 2010; Excell, Linington & Setshusa, 2015).

In 2001, the reception year, commonly referred to as Grade R, was introduced by the Department of Education (DoE, 2001). Grade R entails a year of schooling prior to the formal commencement of instruction in Grade 1, and serves learners between the ages of five and six years. Even though the DoE aimed to have 90% of all learners attending Grade R by 2010, this goal has not yet been achieved.

Within the context of South Africa, Grade R was introduced as a bridging year due to the inequalities of the past, with many children having little or no exposure to pre-school education. As a result of this, many children were failing Grade 1 (Excell, Linington & Setshusa, 2015). However, there was hope in the fact that a year of pre-

school education would help children cope more successfully in Grade 1 when the initiative was launched. Even though structured preparation in Grade R is important, it can, however, not be taken as the solution to all school-related difficulties experienced by Grade 1 learners. This year is viewed as crucial, and every small step of progress makes significant differences in children's lives and readiness to progress in school (Excell, Linington & Setshusa, 2015).

Since implementation in 2001, the access and quality of Grade R education have hugely increased. In addition, a steady increase has occurred in Grade R enrolments in schools - 15% in 1999 to 70% in 2010. This excludes coverage in community-based sites. According to the *National Action Plan* for 2014 (Department of Basic Education, 2011a), the aim is to increase the percentage of learners who have access to formal Grade R programmes to 80% by 2014, and to 100% by 2019.

Despite a steady increase in learner enrolment in Grade R, researchers such as Atmore et al. (2012) indicate challenges such as infrastructure, nutrition, teachers' qualifications and professional development as barriers that prevail. These authors state that prominent challenges and obstacles within the South African education system further exacerbate the problems; and these include the absence of learning materials and resources, minimal financial support, and the lack of qualified teachers. According to the policy framework "*Universal Access to Grade R*" (DoBE, 2011b) challenges like the lack of clear legislation to govern the provision of quality Grade R education to all children include within it the following:

- Grade R is not yet compulsory, leaving parents with the option of not sending their children to Grade R. The hope however is that legislation will be amended and that by 2019, Grade R will be compulsory.
- Limited reliable data is available on community-based or stand-alone Grade R sites.
- Grade R is viewed as part of the Foundation Phase but is not serviced in the same manner as the rest of the grades in the Foundation Phase.
- In the majority of the provinces, Grade R is managed by a separate pool of officials. These officials are responsible for curriculum support and execution, as well as all other areas of implementation, funding, monitoring and payment of subsidies.

- The norms and standards for funding for Grade R permit for the employment of Grade R teachers by School Governing Bodies (SGBs) as well as by the Department of Basic Education (DoBE), with the result that no fixed salary scale exists.

2.4.2 South African Grade R Curriculum

The current South African Grade R programme (pre-schooling phase, pre-Grade 1) was formalised as policy in the *National Curriculum Statement Grade R-12 (NCS)* and *Curriculum Assessment Policy Statement Grades R-3 (CAPS)* as part of the *National Curriculum Statement* (DoE, 2011, 2012). A resource pack was developed to support teachers in their implementation of the curriculum. This pack includes posters with 20 different themes, storybooks, a teacher's guide, lesson plans, and an assessment plan with guidelines for each quarter of the school year. The pack is designed to guide and support Grade R teachers in developing day-to-day teaching and learning activities.

Rutgers (2015) describes the Grade R curriculum as a document entailing everything that happens in a school day with reference to the teaching that occurs, learning that takes place and understandings that learners gain from their experiences in the classroom. This author furthermore explains that the current curriculum is guided by five principles which can act as a *"compass for the Grade R teachers"* (Rutgers 2015: 37). The guiding principles are presented and briefly discussed in Table 2.5.

Table 2.5: Guiding principles of the South African Grade R curriculum (Rutgers, 2015)

Principle	Description	Value of the principle
Emphasise holistic development	Teachers are required to intentionally address the following key domains of education: physical, perceptual-motor, social, emotional, cognitive and moral development.	It is essential to emphasise the holistic development of children and an integrated curriculum approach, that will allow children to express themselves creatively, using the whole body and senses in order to acquire knowledge, skills, values and competencies.
Implement a thematic, culturally responsive and integrated curriculum	Learning must be guided by a planned and integrated curriculum, with identified learning outcomes that are age and stage appropriate, and takes into consideration the development of the holistic child. A thematic approach can be followed to provide conceptually-rich teaching and learning experiences. Teachers must act as facilitators of the learning process.	Learning is not seen as an isolated activity. Context- focused learning experiences are recognised as these support learning through association, experiential learning and child-centred learning approaches.
Utilise language as a tool for learning in a structured and stimulating learning environment	The curriculum is taken as offering many opportunities for interaction. Focus should be placed on children's vocabulary expanding through regular communication and effectively planned discussions. New words are introduced according to themes and sub-themes.	Language is seen as part of children's being and the ability to speak languages is taken as supporting the development of self-esteem. The Grade R curriculum thus centres around language, not only for reading, writing, speaking and listening, but also in terms of the language of numbers.
Focus on learning through play	Play is taken as central to the curriculum, allowing children to be active learners, by interacting with a wide range of materials, projects and learning areas. Play is central to constructivist, developmentally appropriate pedagogy, and is seen as the main vehicle through which children integrate knowledge in a meaningful way.	During play activities, the teacher is the facilitator and mediator of learning. Teachers thus provide opportunities for individual and group exploration.
Follow a child-centred approach	Child-centred pedagogy supports the view that children's abilities and enthusiasm are important for learning. The child is seen as the centre around which the planning of teaching and learning programmes need to take place.	When children are taught in ways that match their learning styles, the learning outcomes are likely to improve.

In a study conducted by Clasquin-Johnson (2016), the author posits that curriculum implementation is highly dependent on teachers' knowledge, skills, beliefs and attitudes. In addition, external factors such as professional development, resources and instructional support play a significant role and can enhance the level of teaching. However, Clasquin-Johnson (2016) furthermore indicates that unqualified teachers will follow the curriculum as a *"script",* which in my opinion may lead to a watered-down, formal approach during the implementation of the Grade R curriculum, not necessarily allowing children to learn through play, and explore through their senses and bodies when gaining knowledge.

In applying the content and principles of the Grade R curriculum to my study when I designed the perceptual-motor development intervention, I firstly focused on the holistic development of Grade R learning, and aimed to ensure that the various developmental domains are addressed in the intervention. Secondly, I designed the different intervention activities around the themes prescribed by the CAPS document as I believe that the themes are context-focused, with learning experiences being recognised and learning supported through association. Thirdly, keeping in mind the Vygotskyan (1978) principles, that formed part of my conceptual framework, I centred my intervention programme around language, not only for reading, writing, speaking and listening, but also in terms of the language of numbers. Furthermore, as play and active learning are considered central to the curriculum, I included a wide range of materials, projects and learning areas that children could interact with. I designed most activities within *play* as the teaching and learning approach, and used many sensory motor activities where learners had to explore and discover answers to problems by means of social interaction, language usage and the contact with teachers as the facilitators. This resulted in me following a child-centred approach for the intervention (Rutgers, 2015), where learning outcomes could potentially improve as a result of the intervention.

2.5 CONCEPTUAL FRAMEWORK OF THE STUDY

The conceptual framework I developed (Chapter 1, Figure 1.1) is based on my integration of aspects of the socio-constructivist theory of Vygotsky (1978), the cognitive constructivism of Piaget (1953), cognitive development theories such as the

information-processing theory (Schraw & McCrudden, 2013), and the model of cognitive development (De Jager, 2012; Van den Heever, 2013). In the following subsections I first explain my understanding of the four theories I relied on, and then elaborate on the manner in which I integrated constructs and principles of these theories into a conceptual framework.

2.5.1 Constructivist theories

Constructivism refers to theories of learning. Children learn or adapt, and are directly influenced by the people, materials and situations with which they are in contact (Schoen, 2011). In other words, children build on pre-existing knowledge, be it intellectual, social or moral, when learning. In terms of Piaget's theory and the processes of assimilation and adaptation, children learn by imbibing new ideas and integrating these into their existing knowledge bases. When compiling my conceptual framework, Piaget's theory (1953) provided me with a framework on the way that children think. Vygotsky (1978) offered me with the principle of cognitive development being seen as a process of learning, which is influenced by the socio-cultural context of the child (Excell et al. 2015). Vygotsky aptly states that through social experiences, interaction with and expectations from peers, children and adults shape other children's learning and construction of knowledge (Excell et al. 2015).

2.5.1.1 Socio-constructivist theory of Vygotsky

Lev Vygotsky (1896-1934) views children as active participants of learning who construct their own knowledge and understanding with the help and support of adults who enable them to take charge of their own thinking during interaction and collaboration (Excell et al. 2015; Vygotsky, 1978). Vygotsky's perspective thus indicates how culture is transmitted to the next generation in terms of the values, beliefs, customs and skills of a social group (Berk, 2013). Vygotsky believes that as adults help learners accomplish culturally meaningful activities, communication between them will become part of the learners' thinking. As learners internalise these discourses, they will utilise language within them to guide their own thoughts and actions, and ultimately obtain new skills (Berk, 2013; Vygotsky, 1978).

Interaction with others include hints and clues, the rephrasing of questions, asking learners to restate what has been said, determining whether or not learners understand, and demonstrating tasks or parts of tasks (Charlesworth, 2008). Vygotsky emphasises the importance of developmentally appropriate instructions in order for learners to be able to learn with assistance. In this regard, Vygotsky conceptualises the zone of proximal development (ZPD), described as "*the distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem solving under adult guidance".* It follows that it is important for teachers to provide activities to learners which are just beyond the independent level, but still within the ZPD (Berk, 2013; Charlesworth, 2008).

Naturally, a learner's ZPD will change over time, as tasks that are mastered may be replaced by other more complex tasks (McDevitt & Ormrod, 2013). Vygotsky (1978) proposes that learners will learn little when performing tasks that they had already mastered. They will rather attempt tasks that they can accomplish only in collaboration with a more competent individual. Interaction that takes place is believed to encourage learners to think about the tasks in particular ways, to attach labels to these, recognise underlying principles, and draw conclusions (McDevitt & Ormrod, 2013).

Language is central to Vygotsky's theory, as language development can promote thinking and the ability to understand the social and physical worlds (Doherty & Hughes, 2014), resulting in scaffolding (Arnett & Maynard, 2013; Vygotsky, 1978). Scaffolding is regarded as a tool or social guidance opportunity that can provide a learner with help at first, in order to accomplish something and then be able to move to a position of doing something independently (Arnett & Maynard, 2013). According to Powell and Kalina (2008), effective teaching will occur when teachers and learners communicate optimally, using constructivist strategies, tools and practices. Thus, it is important that teaching methods are based on knowledge of child development in order to foster optimal learning (Maree, 2004; Vygotsky, 1978).

In this study, I considered the ZPD when implementing the perceptual-motor intervention programme. One of the participating Grade R teachers was pivotal in facilitating the intervention programme and could thus potentially have an influence on

the level of school readiness of the participants. As Vygotsky believes that the manner of interaction between an adult and a child is a core factor in cognitive development (Aubrey & Riley, 2016), the teacher could adjust the degree of help (scaffolding) she offered, in order to match the needs of the child-participants. I was furthermore guided by the ZPD concept (Vygotsky, 1978) when defining the perceptual-motor skills which had not yet developed optimally among the children, but seemed to be in the process of maturation at the onset of the study. The role of the participating teacher was to assist the child-participants in carrying out perceptual-motor tasks within their ZPDs which were slightly beyond their competence, but tasks they could manage when guided, in order for them to succeed.

2.5.1.2 Cognitive constructivist theory of Piaget

Jean Piaget's (1896-1980) main focus of constructivism falls on the individual learner and how the learner constructs knowledge. Cognitive constructivism can be viewed as a developmental perspective on how learners learn, think and remember (Langston & Abbot, 2010; Piaget, 1953). Piaget's stages of development (section 2.2.2.2) which I refer to are well recognised as a basis for depicting logical thinking among learners (Powell & Kalina, 2008).

In essence, Piaget views the learner as an active individual who constructs personal knowledge through direct engagement with the environment. Piaget (1953) explains that children will construct increasingly complex mental maps of their worlds in an attempt to organise, understand and adapt. Movement plays an important role in the process of perceptual readiness (Gallehue & Ozmun, 2006), and by actively engaging with the environment, learners will be able to internalise their actions by constructing schemas or cognitive frameworks for making sense of their experiences of the world (Morgan, 2010). Piaget futhermore explains that schemas are dynamic and will change according to a learner's stage of biological development, as learners actively assimilate and accommodate new information from the environment into existing schemas.

Assimilation, according to Piaget (1953), occurs when learners integrate new knowledge into their own schemas, whereas *accommodation* involves learners changing their schemas to *"accommodate"* new information or knowledge. This will

occur when existing schemas are challenged and disequilibrium is experienced (Morgan, 2010; Piaget, 1953). Powell and Kalina (2008) state that, according to Piaget, equilibration will be regained when a learner shifts from one stage to another, trying to make sense of information by adjusting current thinking (schema) to resolve conflict, or restore equilibrium.

Grade R learners generally function in Piaget's pre-operational stage, where they aquire the ability to represent ideas and engage in mental images. At this stage the child requires constant stimulation in order to form new schemas through the joint processes of assimilation and accomodation (Aubrey & Riley, 2016). This is done through the medium of language (Excell, Linington & Schaik, 2015), with the teacher's role being that of creating an environment that is stimulating and conducive to the process of meaning-construction and knowledege-gain. During this process, teachers can encourage children's thinking by asking questions, and allowing them to observe and pay attention to their own ideas (Schoen, 2011).

In this study I took into account that a young learner's learning can often be described in terms of senses and movement associated with the sensori-motor stage (Piaget, 1953) as learners generally imitate what they hear and see until they are able to think a problem through (Langston & Abbot, 2010). From this viewpoint, I regarded the participating teacher as facilitator of the construction of knowledge, thus not as a transmitter of knowledge, and as someone who would rely on the principles of scaffolding when facilitating the intervention programme. In addition to Vygotsky's theory, I also relied on Piaget's theory when developing the perceptual-motor skills intervention programme.

2.5.2 Cognitive development theories

As children progress through childhood, their thinking becomes more sophisticated and organised. Children get more elaborative, less vague and more general in their thinking as they become more socialised During the pre-school years spesifically, children constantly expand their knowldege about the physical and social world (Louw & Louw, 2014).

2.5.2.1 Information-processing theory

Information-processing theorists state that cognitive development is less consistent, more complex and more multifaceted than what Piaget proposes (Louw & Louw, 2014). These theories focus on the process of cognition; in other words, on the information obtained *via* the environment and how the brain processes this (Doherty & Hughes, 2014). McDevitt and Ormrod (2013) describe information-processing theory in terms of how human beings obtain, think about, mentally adjust and recall information. Gallahue et al. (2012) refer to this theory as the process through which one attaches meaning to information. It follows that perception, according to the information-processing theory, is a process whereby the sensory modalities (i.e. visual, auditory, gustatory, tactile, and kinaesthetic) provide input to the brain (Gallahue et al. 2012). This process is regarded as an *"input-output"* process and does not involve separate activities.

Schraw and McCrudden (2013) furthermore indicate that information-processing comprises of three main components; namely, the sensory register, working or short-term memory, and long-term memory. The sensory register and working memory will enable people to handle some degree of incoming information during initial processing, whereas long-term memory serves as a permanent repository for knowledge. As information flows sequentially through each of the components, mental strategies can be utilised to operate and change this and increase the chance that information is being retained. Information can thus be used efficiently, to think flexibly and adjust information to changing circumstances (Berk, 2013).

According to Louw and Louw (2014), short term memory can be described as a child's working memory, with children being increasingly able to store and process more material in their short term memories. Long term memory however, is regarded as a permanent store of information. When experiences are repeated, it becomes general memory (Louw & Louw, 2014). Memory strategies involve important mental activities that can improve the processing and storing of information in the form of retrieval and rehearsal. During rehearsal, children repeat target information while retrieval involves the process of accessing information and entering it into the consciousness.

Siegler and Alibali (2005), cited in Doherty and Hughes (2014) propose four assumptions of information-processing theories, which I applied during my study. Firstly, thinking is regarded as information-processing, and will evolve as the learner becomes more experienced. Secondly, information-processing theories change mechanisms, implying that learners will get better at thinking with age. Thirdly, development is seen as being led by self-modification, by building up and modifying earlier knowledge. Finally, task analysis is viewed as important and can allow a learner to understand what is needed to solve a problem (Doherty & Hughes, 2014).

In conclusion, Kephart (cited in Gallahue et al. 2012) states that the perceptual-motor process will play a pivotal role in the designing of learning activities. In terms of information-processing theory, I considered the relation between school readiness and perceptual-motor skills, as identified by Van Zyl (2004), as well as the relationship between academic performance and perceptual skills described by Pienaar et al. (2014), in planning and conducting this study.

2.5.2.2 De Jager's model of cognitive development

De Jager's model of cognitive development aligns with the information-processing theory but places a stronger emphasis on the role of the human body in the learning process, indicating that it is not only the cognitive and emotional/social abilities that are important in preparing a learner to learn with ease, but also the physical ability of a child to learn (De Jager, 2014; Krog & Kruger, 2011). In this regard, De Jager (2014) states that the foundation of the physical ability to learn consists of two systems that may stabilise the levels of learning: *input* is obtained *via* the senses, and *output* is then established *via* skilled muscle movement (Van den Heever, 2013).

Pienaar et al. (2014) elaborate on this idea, stating that visual and auditory integration imply the ability to coordinate information obtained *via* the senses to motor output, or to the degree to which perception and movements are coordinated. Motor proficiency describes the development of complex movements and motor control by using fine and gross motor skills, which in turn emphasise the link between perceptual-motor development and literacy in reading, writing and numeracy. This author explains how physical development forms the metaphoric foundation of a house (Van den Heever, 2013) and occurs as a result of input *via* the senses when processing takes place and

movement or action occur. As many learners in South Africa enter the formal schooling system without receiving the necessary stimulation and optimal perceptual-motor development (Biersteker, 2010a; Erasmus, 2012; Erasmus, Janse van Rensburg, Pienaar & Ellis, 2011; Pienaar et al. 2014; Van Zyl, 2004), I kept in mind what was proposed by De Jager's model of cognitive development and information processing when developing and implementing the intervention programme.

2.5.3 Integrating aspects of existing theories into a conceptual framework

Figure 1.1 (refer to Chapter 1) represents my integration of selected concepts and principles of the theories discussed in the preceding sections, into a conceptual framework. The framework represents my view of school readiness as a multidimensional concept. It furthermore captures the way in which I relied on the discussed theories as background to developing a perceptual-motor enrichment intervention for Grade R learners, and subsequently for interpreting the results I obtained.

Various studies (Cameron et al. 2012; De Jager, 2014; Erasmus et al. 2011; Pienaar et al. 2014; Van Zyl, 2004) indicate positive relationships between perceptual-motor skills development and school readiness. Both Piaget and Vygotsky suggest that learners are cognitively ready for certain experiences at any given time of their development but not for others (McDevitt & Ormrod, 2013). During the designing phase of the perceptual-motor intervention programme, I thus relied on Piaget's cognitive constructivist theory, focusing on the pre-conceptual phase where learners supposedly require games and activities to promote conceptual development (Piaget, 1953). These forms of activities can ultimately lead to more advanced levels of cognitive development which is required for formal schooling. As such, I considered the importance of concrete experiences before emphasising more abstract thinking and development.

In line with Piaget's description of the phases of development, I valued practical and concrete experiences, which is required as a basis for learning (Beard, 1969). Therefore, I designed the perceptual-motor activities of the intervention to appeal to children requiring the use of one or more of the senses (visual, auditory, tactile, smell or taste). I primarily made use of a kinaesthetic approach by first including a phase

where learners were required to make use of concrete objects, and then later moved to a more abstract or two-dimensional approach (table-top activities such as workbooks, and pen and paper activities).

During implementation of the perceptual-motor intervention programme I relied on the socio-constructivist theory of Vygotsky. A teacher fulfilled the role of facilitator of the perceptual-motor skills intervention programme, encouraging learners' participation and learning. This process involved learners as active participants with accomplishments being viewed as an index of development. Learners were thus supported to think, know and do by an adult (teacher), using scaffolding to break down complex tasks and adjusting the level of assistance as children progressed. Throughout, the learners' ZPDs were considered by relying on scaffolding, as described by Vygotsky, in order to facilitate optimal learning that could potentially enhance school readiness.

I also utilised information-processing theory and De Jager's model of cognitive development during implementation of the perceptual-motor intervention programme. Tasks associated with perceptual-motor skills (input) were provided to Grade R learners with the aim of assisting them to process sensory modalities, selectively focusing their attention on significant information and taking part in as much automated processing as possible (Schraw & McCrudden, 2013). According to Schraw and McCrudden (2013), it is essential for learners to become automated in terms of basic perceptual skills in order to become ready for formal schooling (output). I furthermore relied on De Jager's model of cognitive development (De Jager, 2009) during the implementation phase, attending to the explanation of how the brain is connected with the senses, and how muscles form the foundation of physical development.

During post-intervention, I relied on De Jager's (2009) model of cognitive development, theory of information-processing, and Vygotsky's (1978) socio-constructivist theory when I interpreted the Grade R learners' levels of school-readiness. I explained the results (refer to Chapter 5) in terms of the information-processing theory, relying on Schraw and McCrudden's (2013) argument that perceptual-motor skills can become automated and result in increased levels of school readiness. De Jager's model of cognitive development indicates that learning will take

place *via* the senses and movement, thereby implying that movement or motor skills can improve learning (De Jager, 2012; High, 2008; Krog & Kruger, 2011; Pienaar et al. 2014).

2.6 CONCLUSION

In this chapter, I discussed existing literature on early childhood development and the current scenario of early care and education in the South African context. I specifically focused on Grade R learners and the potential value of structured enriching interventions. As background to the intervention programme which I developed as part of this study, I explored the multi-faceted concept of school readiness, and the current South African Grade R curriculum. I concluded the chapter by explaining the conceptual framework of the study based on my integration of the cognitive constructivist theory of Piaget, the socio-constructivist theory of Vygotsky, information-processing theory and De Jager's model of cognitive development.

Chapter 3 focuses on the research design and methodology I utilised. After discussing the paradigmatic approaches I followed, I present my selected research design and the methods I employed for data collection, documentation and analysis. Throughout, I justify the choices I made in terms of the specific focus and purpose of this study.

CHAPTER THREE:

RESEARCH METHODOLOGY AND STRATEGIES

3.1 INTRODUCTION

The purpose of this study was to explore how Grade R learners may be supported to become school ready through a perceptual-motor intervention. In chapter 2, I reviewed existing literature pertaining to early childhood development and the current situation of early care and education in the South African context, referring to the various domains of child development, I explored the concept of school readiness, formal schooling in South Africa, and what the current Grade R curriculum entails. I contemplated the importance of perceptual-motor development for school readiness, more specifically in a resource-constrained context. I concluded the chapter by explaining the conceptual framework of the study, in terms of the various theories I relied on.

In this chapter, I discuss the empirical part of my study. I describe and justify my selected paradigms, as well as the research design I implemented. I then explain the research process in terms of the methodological choices I made, explaining my selection of participants, and the data collection, documentation and analysis strategies I employed. I also elaborate on the measures I took to ensure rigour and the ethical considerations I adhered to.

3.2 PARADIGMATIC PERSPECTIVES

Research is about understanding the world. Researchers' understanding is however also informed by how they view the world (Jansen, 2010). According to Sefotho (2014), world views form the basis of paradigms which will in turn culminate in insight into phenomena. Broadly speaking, TerreBlanche and Durrheim (2006) regard paradigms as all-inclusive systems of interrelated practice and thinking, that define the nature of any researcher's enquiry along three dimensions; namely, ontology, epistemology and methodology. According to these authors (TerreBlanche &

Durrheim, 2006), ontology specifies the nature of reality that is studied and what can be known about it, while epistemology entails the nature between the researcher and what can be known. Finally, methodology indicates how the researcher go about practically studying whatever she or he believes can be known.

3.2.1 Epistemological paradigm: Pragmatism

Biesta and Burbules (2003) state that, in educational research, the aim is to generate knowledge that is relevant to educators that can inform their actions and activities, and support and guide their decision-making. This idea, that educational research should be relevant for educational practice, is far from new. Since the end of the eighteenth century, when education became the object of systematic scientific inquiry, educationists have stressed the practical orientation and significance of educational research. As a result, pragmatism was introduced and derived from the work of Peirce, James, Mead and Dewey (Creswell, 2013). Within this paradigm, emphasis is placed on actions, situations and consequences rather than antecedent conditions (Creswell, 2013). With this statement in mind, a pragmatic notion is implied, where the researcher focuses on the research problem rather than on the method.

In line with the nature and topic of this research study, the information I researched, the context and the participants, I selected pragmatism as the epistemological paradigm. Pragmatism as a world view arises out of actions, situations and consequences (Creswell, 2009). According to this paradigm, the researcher will subsequently collect data on *"what works"* in order to address the research question (Creswell & Plano Clark, 2007, p.24) and find solutions to problems (Creswell, 2009). As the focus of pragmatism falls on the consequences of research, it is viewed as pluralistic and orientated towards practicality (Biesta & Burbules, 2003; Creswell, 2009; Creswell & Plano Clark, 2007).

Pragmatism allowed me to use different methodological strategies in attempting to understand and explain the phenomenon under study. As this paradigm entails a process of adapting logical thinking to practical constraints of real-life situations (Arnett & Maynard, 2013), it seemed suitable for my study which followed a mixed-methods approach.

To this end, Creswell and Plano Clark (2007) explain that in pragmatist studies, a researcher can draw on both quantitative and qualitative assumptions and utilise various methods to address different aspects of a study or different layers of a phenomenon (Feilzer, 2010). Creswell (2009) elaborates and proposes that pragmatism will allow a researcher freedom of choice, choosing methods and techniques that can best meet the needs and purpose of a study. As indicated, my choice of pragmatism thus aligned with the mixed-methods approach which I followed in determining whether or not a perceptual-motor enrichment intervention can improve the levels of school readiness of Grade R learners.

The mixed-methods approach I followed was thus supported by multiple worldviews, as implied by pragmatism. According to Creswell (2015, p.10) the notion of *"what works"* applies well to selecting the methods of *"what works best"* when relying on this paradigm. This could however cause challenges as one may feel forced to mix methods. To this end, Creswell (2013, p.78) reccomends that a pragmatist researcher utilises pragmatism as an *"umbrella paradigm"* in order to suitably merge quantitative and qualitative methods to obtain a deeper understanding of how best to answer the research questions of a study (Creswell, 2013).

Closely related, Bazeley (2004) emphasises that the mixed-methods researcher necessitates a good working knowledge of the multiple methods being used, their assumptions, analysis procedures and tools, and the ability to understand and interpret results derived from different methods. In addition, the level of understanding of the audience can present another challenge. As such, the mixed-methods reseacher needs to transfer the details of methods which are unfamiliar to readers of the study (Bazeley, 2004). Throughout. I remained cautious of these potential challenges and aimed to address them, as suggested by Bazeley (2004).

3.2.2 Mixed-methods approach

According to Creswell and Plano Clark (2007), mixed-methods research suggests certain philosophical assumptions as well as methods of inquiry. As a methodology, mixed-methods research involves the blending of the quantitative and qualitative approaches to research in the phases of the research process. It thus centres on collecting, analysing and mixing quantitative and qualitative data in a single study

(such as my study) or a series of studies. The main idea is that the combination of the quantitative and qualitative approaches will provide a better comprehension of the research problem than when utilising only one of the approaches.

Therefore, in a mixed-methods study both numerical and text data are collected and analysed to address different aspects of a general research problem, in order to obtain a comprehensive understanding of the topic under investigation (Ivankova, Creswell, & Plano Clark, 2010). Creswell and Plano Clark (2007) are of the opinion that mixed-methods research suggests strengths that can offset the weaknesses of both quantitative and qualitative research. Instead of being restricted to one type of data collection strategy, various tools can be included for data collection and documentation. Figure 3.1 provides a conceptual view of the mixed-methods research approach, highlighting the integration or mixing aspect.

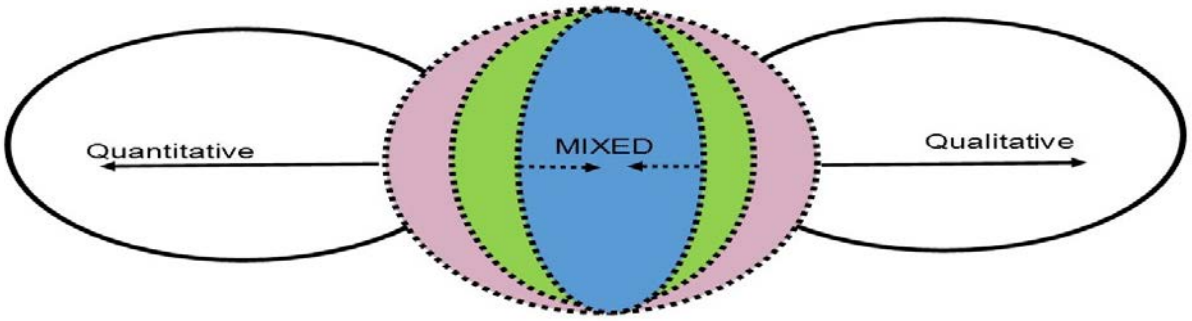

Figure 3.1: Conceptual view of the mixed-methods research approach (Plano Clark & Ivankova, 2016)

Plano Clark and Ivankova (2016) accordingly explain mixed-method research in terms of three overlapping spheres that highlight the three approaches. While quantitative research examines the relationships among variables by collecting and analysing numeric data which are presented in the form of numbers or scores relying on standarised instruments, qualitative data focus on individuals' experiences and views of phenomena which are expressed in words. Plano Clark and Ivankova (2016, p.9*)* state that *"mixed methods research is depicted by several nested, dashed shaded spheres"* which are placed in the centre to capture and represent different degrees of integration of the quantitative and qualitative methods in a mixed-methods study.

In my mixed-methods study, I relied on quantitative research to assess the school readiness levels of the participating Grade R learners pre-intervention and post-intervention. Scores were also compared between the two groups of participants (experimental and control group) concerning pre-intervention and post-intervention. I included qualitative data to support the quantitave data sets I obtained. To this end, I conducted interviews with Grade R teachers in order to obtain detailed data in terms of their understanding of perceptual-motor development and its relation to school readiness pre-intervention. In my study quantitative data thus formed the primary data set, while qualitative data were included in support of the quantitative results I obtained. In following a QUAN→qual approach, the two sets of data were taken as being separate, yet also connected (Creswell, 2009). I provide an overview of the strategies I utilised in Figure 3.2.

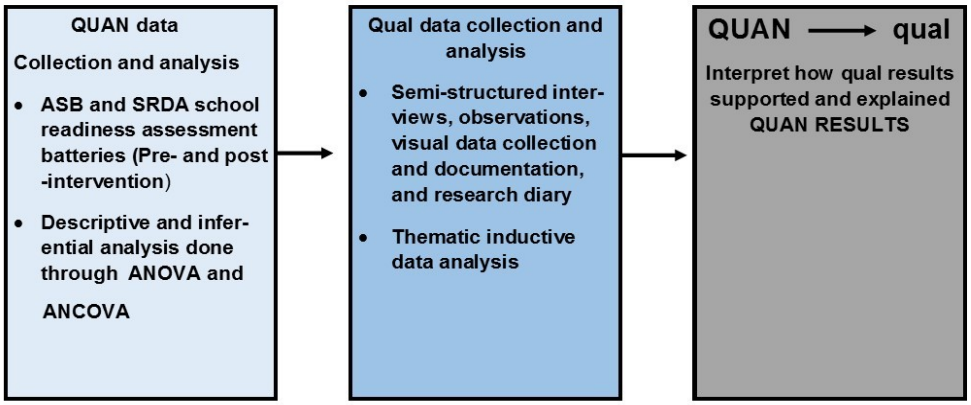

Figure 3.2: Explanatory sequential mixed-methods approach (Creswell & Plano Clark, 2007)

As already implied, mixed-methods studies usually include two or more stages that are combined at different points, depending on the focus and purpose of the study (Ivankova, Creswell, & Stick, 2006). For the current study, I utilised a sequential explanatory mixed-methods approach. As such, I first collected and analysed QUAN data and thereafter qual data. This selected sequence assisted me to elaborate on the Quan results I obtained during the first data collection phase. I selected this approach

as the analysed QUAN data provided me with the profiles of participating Grade R learners in terms of their school readiness levels before implementation of the perceptual-motor intervention. The follow-up qual data assisted to explain some of the statistical results after exploring the Grade R teachers' understanding of school readiness and its relation to perceptual-motor development (Ivankova et al. 2006).

Potential limitations associated with mixed-methods research include that it may take long to collect and analyse both quantitative and qualitative data. In my study I made use of two different school readiness test batteries, of which one was administered individually and took a long time to complete with all the participants. This process took place both pre- and post-intervention. I also conducted interviews for qual data supporting the QUAN data I obtained. In order to address this challenge I relied on trained field workers who assisted me in administering the school readiness tests both pre- and post-intervention. In this manner, I was able to contain the time it took to assess the Grade R-participants, more spesifically in terms of the test that was administered individually.

Furthermore, the research process required for a mixed-methods study can be complicated and may challenge the researcher in terms of switching between methods. As I followed a sequential mixed-methods approach, I however did not experience it as challenging to move from QUAN to qual data collection strategies. In addition, the fact that two different groups of participants (Grade R learners and teachers) were involved in QUAN and qual data collection respectivley, may have assisted me in not experiencing this as a challenge.

3.3 RESEARCH DESIGN AND METHODOLOGICAL STRATEGIES

In this section I discuss the research design I selected. I furthermore describe the research site, participant and sampling procedures, and data collection, documentation and analysis strategies I utilised.

3.3.1 Research design: Single-case experimental design

A research design provides a strategic framework for action, that functions as a link between the research questions and implementation of the research strategies

(Durrheim, 2006b). As such, research designs are plans that guide the choices and execution of data collection, documentation and analysis (Durrheim, 2006b). In this study, I employed a single-case experimental design.

Yin (2013) and Bryman (2002) share the opinion that case study designs can be employed for both quantitative and qualitative studies, which support the mixed-methods approach I followed. Yin (2013) states that a *"case"* refers to a real-life phenomenon characterised by concrete manifestation. Closely related, Du Plooy-Cilliers and Cronje (2014) mention that a case study design provides for thick and detailed descriptions of a social phenomenon that exist within a real-world context. Botha, Greeff, Mulaudzi, and Wright (2010) argue that cases are bounded by time and activity, and propose that researchers can collect detailed information on cases by using a variety of data collection and documentation procedures over a period of time. Lindegger (2006) similarly views case study research as the intensive investigation of individuals, groups or units. The case I selected to study was Grade R learners' school readiness, in a resource-constrained context.

Experimental case study designs are often utilised when answering a cause-and-effect research question. In this instance I investigated the effect of a perceptual-motor intervention programme on the school readiness of Grade R learners (dependent variable) (Maree & Pietersen, 2010a). For this purpose, I relied on a pre-test/post-test strategy including a control group, within the single-case experimental design (SCED). Figure 3.3 provides an overview of the SCED I implemented.

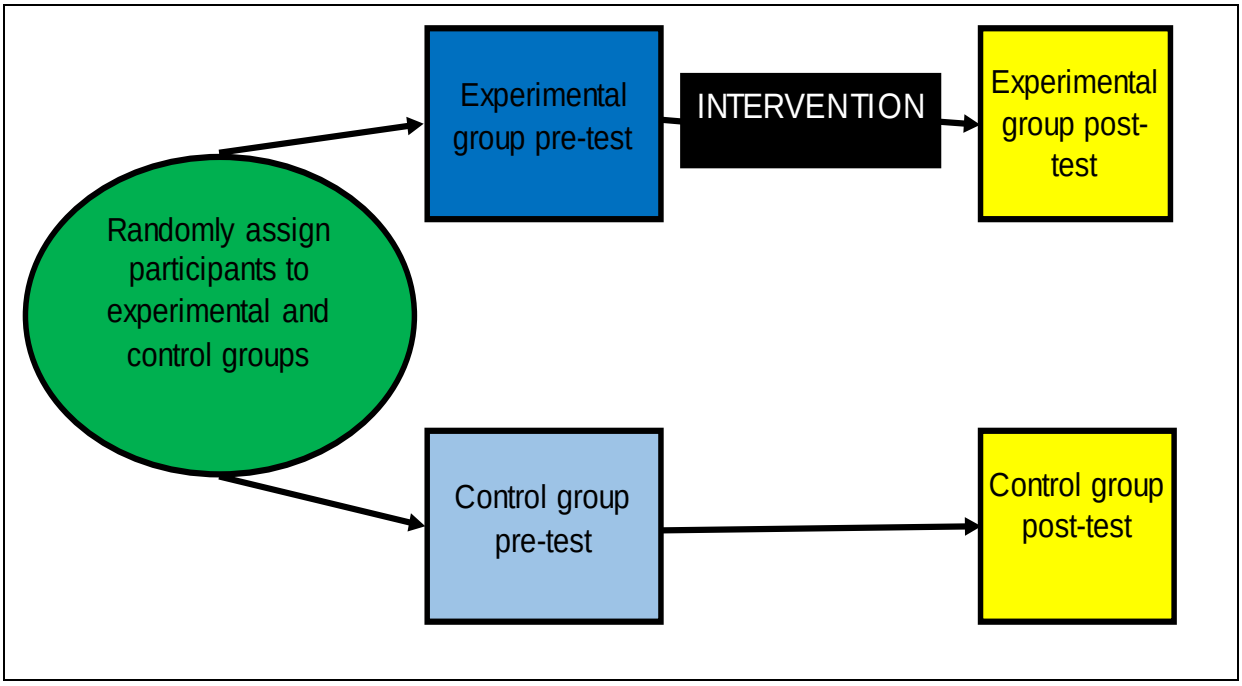

Figure 3.3: Overview of single-case experimental design involving a pre-test/post-test strategy (Maree & Pietersen, 2010a)

A SCED is a form of case study design that includes components of manipulation (some participants in this study could benefit from an intervention), control (some participants formed part of a control group and did not initially receive the intervention) and randomisation (used to assign participants to different groups) (Lindegger, 2006; Maree & Pietersen, 2010a). These kinds of studies usually start with a baseline assessment (measurement), in this case a pre-intervention assessment of school-readiness by implementing the *School Readiness Diagnostic Assessment* test (SRDA) and the *Aptitude Test for School Beginners* (ASB). The aforementioned was followed by the implementation of the perceptual-motor intervention I developed using a section of the participants (experimental group) (Lindegger, 2006). Post-intervention tests on school readiness followed as the last phase, implementing the same two instruments that were used pre-intervention.

According to Nock et al. (2007), a SCED can enable the researcher to demonstrate casual relations between an intervention and change in behaviour, with much more efficiency than large sample designs. This kind of design also allows for flexibility in the implementation and evaluation of interventions, as data are collected within the context of the issue or the situation in which the activity takes place (Zainal, 2007). In

this instance, QUAN data (school readiness levels) were collected from Grade R learners within the context of a resource-constrained background. Willes (2014) argues that a SCED, through the application of multiple research methods, can provide empirically rich data and a holistic account of a specific phenomenon. The author furthermore states that this design is practical, as well as economical in terms of money, manpower, time and effort (Willes, 2014).

Cohen, Manion and Morrison (2010) however, state that it is more difficult to control the variables or factors involved in SCED studies when compared to true experimental designs, where experiments take place in a controlled environment such as a laboratorium. The same degree of control can never be reached in educational experimentations as in the current study. These factors include the learners, the teachers, the school, the classroom organisation, curriculum presentation and resources. These kinds of peripheral variables which are outside the researcher's control in pre-test/post-test studies may thus threaten the validity of the study (Du Plooy-Celliers & Cronje, 2014). I attempted to address this potential limitation by ensuring that all participants attended a quintile 2 primary school within the same township at the time of my field work. Furthermore, the two participating Grade R teachers hold similar qualifications. Resources available at the two schools were also similar at the time, as they are located in the same district and both are serviced by the Free State Department of Education.

3.3.2 Overview of the research process

In line with the SCED I utilised, my study consisted of three phases, as summarised in Figure 3.4**.**

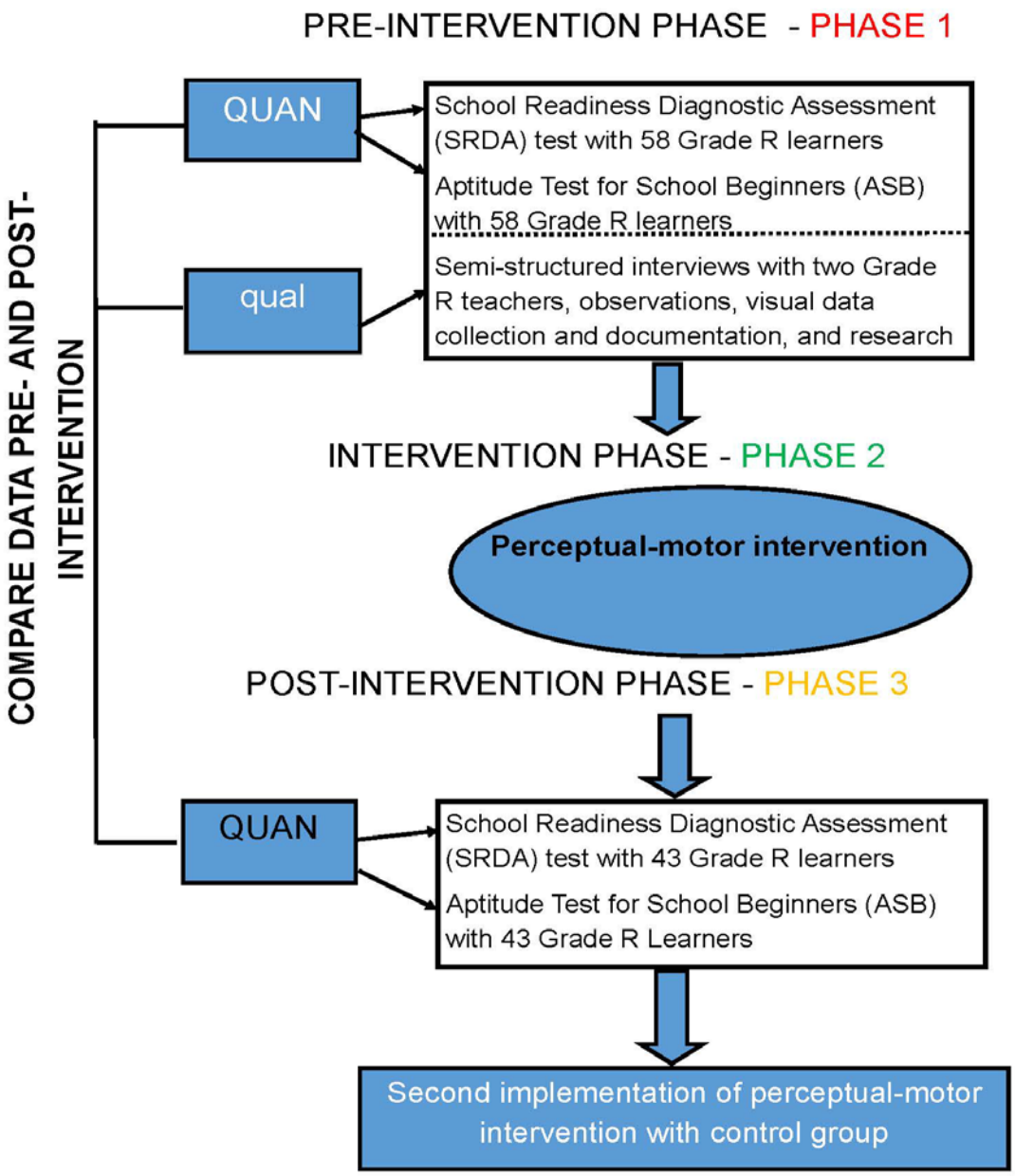

Figure 3.4: Phases of the research process

As captured in Figure 3.4, I obtained data from two primary schools in the Free State, South Africa that had Grade R classes. Both schools are quintile 2 schools.

During the first phase of the study the *School Readiness Diagnostic Assessment* test (SRDA) and *Aptitude test for School Beginners* (ASB) were implemented with 58 learners from these two schools. Thirty-three learners in School A became part of the experimental group and 25 learners from School B formed the control group. The pre-intervention phase provided QUAN data on the learners' levels of school readiness, more specifically in terms of perceptual-motor skills based on the two instruments that were implemented. During the first phase of the study I was assisted by four fieldworkers to conduct the SRDA test. I provided training on test implementation, which included implementation and marking of the test, and capturing the raw scores by means of software that was designed by Van den Berg (2014).

In addition, I collected qual data on the school environment of the Grade R learners as well as Grade R teachers' experiences and views of the perceptual-motor skills of the learners in their classes, and the possible link between perceptual-motor skills and school readiness. The qual data supported the QUAN data that I obtained when assessing the school readiness of the participants.

For the second phase of the study, I developed a perceptual-motor enrichment intervention programme that was facilitated by the one Grade R teacher, under my guidance. The intervention was implemented with the experimental group over a period of eight weeks. Implementation of the intervention was guided by me as I fulfilled the role of *"observer as participant"* (Niewenhuis, 2010b, p.85). I also provided training to the teacher who acted as facilitator of the intervention programme prior to implementation, explaining each activity in detail as well as the purpose of the activity in terms of perceptual-motor development.

After implementation of the intervention programme with the experimental group, post-intervention assessment was conducted (Phase 3) with both the experimental and control groups in order to determine whether or not the intervention programme had resulted in any change in terms of school readiness and the perceptual-motor skills of the experimental group. During this phase, I was once again assisted by the four

fieldworkers with data collection. When interpreting the results, I remained aware of and considered normal child development as a potential factor that could explain change. After completion of the field work, the intervention was repeated with the learners who formed part of the control group by their Grade R teacher. For this purpose, I explained the activities of the intervention programme in detail to her before she implemented it.

3.3.3 Research context

As already stated, the study was carried out in the Bloemfontein area (South Africa) in two quintile 2 public primary schools. The selected schools were accessed after obtaining permission to conduct this study from the Free State Department of Education (FSED).

Bloemfontein is part of the Mangaung Municipality in the Free State Province. The research context can be categorised as an urban, low socio-economic township community. It is one of the oldest Coloured[11] suburbs in Bloemfontein and is situated to the southeast of the city. The community is primarily a Christian community adversely affected by unemployment, alcohol and drug abuse, domestic violence and teenage pregnancies. Single-parent households, HIV and AIDS prevalence and high crime rates are common. The average educational level of the residents in this community was Grade 8 in 2012. Over the past decade, the *"previously Coloured"* community has changed to a community involving additional cultural and ethnic groups (Prinsloo & Reid, 2015).

3.3.4 Selection of case and participants

As indicated earlier, the research process took place in three phases. During the first phase, I purposefully selected two Grade R teachers, whom I interviewed to explore their perceptions of perceptual-motor development, school readiness and the link between perceptual-motor development and school readiness. In purposefully selecting the two Grade R teachers whom I interviewed and who facilitated the intervention with the learners, I intentionally selected participants who seemed

[11] A coloured is a person of mixed European ("white") and African ("black") or Asian ancestry, as officially defined by the South African government from 1950 to 1991(Encyclopaedia Britannica).

knowledgeable in terms of the phenomenon under investigation (Creswell & Plano Clark, 2007). Niewenhuis (2010b) elaborates that this method of selecting participants entails the process of selecting participants based on specific defining characteristics that implies that they (the selected participants) can provide the data required for a study. The selection criteria I applied in selecting the two teachers are the following:

- Participants had to be Grade R teachers at one of the two selected schools.
- Participants had to teach their learners according to the current national Grade R curriculum.
- Participants had to be able to converse in English or Afrikaans.
- Participants had to provide informed consent prior to their participation in the study.
- Participants had to be willing to facilitate the intervention programme.
- Participants had to be available after school hours for the interview and training concerning the intervention programme.

Dudovski (2017) identifies some advantages and disadvantages of purposeful sampling. Purposeful sampling is viewed as a cost-effective and time-effective sampling method that is especially appropriate if only a limited number of primary data sources are available that can contribute to a study (Dudovski, 2017). Purposeful sampling may however include judgement errors by the researcher, and potentially imply limited reliability or a high level of biasness. Furthermore, generalisation of research findings is usually limited, yet this was not my intention in undertaking the current study.

In addition, I obtained QUAN data pre-intervention and post-intervention, as I purposefully selected two schools with Grade R classes which could form the control and experimental groups. In purposefully selecting the two cases, I identified potential schools that would meet the following selection criteria:

- Both schools had to be situated in the Free State Province.
- Both schools had to have Grade R classes.
- Both schools had to be categorised as quintile 2 public primary schools.

- Both schools had to be similar in context and setting, characterised by limited resources, class size and effective implementation of the current Grade R curriculum.

After selecting the two schools (cases), I purposefully sampled all Grade R learners from both schools to represent a population of Grade R learners from resourced-constrained settings in the specific region (Creswell & Plano Clark, 2007). As a result, I purposefully selected 58 Grade R learners from the two schools. Maree and Pietersen (2010b) state that purposeful sampling is utilised with a specific purpose in mind; in my case to explore the effect of a perceptual-motor intervention programme on the levels of school readiness of Grade R learners from resource-constrained backgrounds. The following selection criteria applied in selecting the Grade R learners:

- Learners had to be enrolled for Grade R at one of the two selected schools.
- Learners had to be taught in English or Afrikaans, as these were the languages the SRDA and ASB were conducted in.
- Parents of learners had to give their written consent, and learners had to provide informed assent before the data collection commenced.

All purposefully selected Grade R participants were tested for school readiness, but I also randomly assigned an experimental and a control group to each of the two schools. Only the experimental group (School A, n=33) initially participated in the intervention (Phase 2 of the study) and the control group (School B, n=25) only completed the intervention after my study. My reason for utilising random sampling was that each group under study would have an equal chance of being selected (Cohen et al. 2010; Pascoe, 2014). Kerlinger (1970) cited in Cohen et al. (2010) states that by making use of random assignment when selecting experimental and control groups, conditions may potentially control most of the independent variables.

The independent variables in this case were the learners, teachers, schools, classroom organisation, curriculum presentation, and resources at school. As such kinds of extraneous variables may be outside a researcher's control for pre-test/post-test designs, the validity of a study may be questioned (Du Plooy-Celliers & Cronje, 2014). Keeping the variables in mind, and aiming to attend to the limitations associated

with random sampling, I selected two schools that are both categorised as quintile 2 schools, with similar socio-economic contexts and background of learners, being situated in the same township area. The two teachers had obtained similar training, and the resources at school are more or less the same as both schools are provided with resources by the Free State Department of Education (FSDoE).

Possible advantages of random sampling include the fact that, even in small groups, this method can ensure a great likelihood of equivalence or portioning out between the experimental and control groups of any factors or characteristics of the subjects which may possibly effect the experimental variables in which the researcher is interested (Creswell, 2005). Creswell (2005) furthermore states that random assignment of experimental and control groups may prevent bias in terms of the characteristics of individuals included in a particular group (Creswell, 2005). I followed the guidelines of Cohen et al. (2010) in executing random assignment by doing the following:

- I completed an initial measurement (pre-test) assuming that the school readiness levels (dependent variable) were more or less on the same level for the learners in the two schools.
- I then identified key variables; namely, that all learners had to be between the ages of five and seven, both groups had to come from quintile 2 primary schools, and both groups had to receive tuition in Afrikaans or English.
- An intervention was facilitated with the experimental group, while attempting to keep most other variables constant.
- A final measurement (post-test) was done to compare the results of the control and experimental groups, as well as to identify differences between the pre-test and post-test results.
- The perceptual-motor intervention programme was facilitated with the control group after completing the post-test.

3.3.5 Data collection and documentation

In sequential data collection, the various stages and data collection activities are related to each other with one building on the other (Creswell & Plano Clark, 2007). In this section, I explain how I collected data, firstly in terms of the QUAN techniques I

employed, and secondly I shed light on the qual data collection and documentation strategies I used.

3.3.5.1 Quantitative data collection and documentation

I collected QUAN data by implementing the School readiness Diagnostic Assessment test (SRDA) compiled by Van den Berg (2014), and the Aptitude Test for School Beginners (ASB) structured by Olivier and Swart (1988). I relied on both the pre-intervention and post-intervention results (n=58 pre-test and n=43 post-test). The reason for the attrition in numbers is that, when the ASB test was conducted post-intervention, many learners had not returned to school after the end-of-year school function. In order to assess whether or not the leaners with missing post-scores differed from learners with available post-scores in terms of their aptitude, the average pre-scores of the two groups of learners were compared using a two-way analysis of variance (ANOVA) with factors *School* and *Presence* of post-data. The factor *Presence* was not statistically significant (P=0.6839) thus p>0.05, which suggests that there was no systematic difference in terms of aptitude between learners with or without post-scores.

The SRDA was developed to obtain a differentiated view of the level of school readiness of learners (Van der Berg, 2014), and designed against the background of the CAPS (2011) document. The SRDA is conducted by testing learners individually and takes approximately two hours to implement so frequent breaks are provided for the testee. Activities are designed to assess the different domains of school readiness (physical, social, emotional, and cognitive). The following aspects of school readiness are covered in the following ways:

- *Bilateral integration and symmetry,* which includes activities that assess bilateral integration, midline crossing, and overall movement and coordination.
- *Hand-dominance,* which is assessed by observing which hand the child uses when handling writing instruments and performing fine-motor activities.
- *Midline crossing* which includes activities such as reaching across the body with the left hand to touch the right shoulder.

- Fine motor activities in terms of *fine motor coordination and finger isolation,* such as holding a pencil and crayons, holding and using feeding utensils, effectively fastening zippers and buttons, using scissors, manipulating small items within the hand, managing the tripod grasp, and lacing cards.
- *Perceptual skills* as well as *gross motor skills,* which are assessed by looking at the child's ability to jump, balance, throw, catch, and bounce a ball.
- *Social and emotional development,* which is observed throughout the assessment, on an individual basis and when the child draws a human figure.

I also implemented the ASB (Olivier & Swart, 1988) in support of the data I collected *via* the SRDA. The purpose of the ASB is to obtain a differentiated picture of certain aptitudes of school beginners (Olivier & Swart, 1988). The test battery consists of the following: Perception (Test 1), Spatial (Test 2), Reasoning (Test 3), Numerical (Test 4), Gestalt (Test 5), Co-ordination (Test 6), Memory (Test 7), and Verbal comprehension (Test 8). Although the ideal time to apply this battery is during the sixth to eighth week of Grade 1, it may also be applied in the year preceding Grade 1, as in the case of this study, provided that the testees can understand oral instructions and use a pencil.

The ASB is a group test but can also be applied individually, and teachers can be trained to administer the test. In this study the ASB was applied as a group test (Olivier & Swart, 1988). All the sub-tests on the ASB consist of pictures, therefore the ability to read is not a pre-requisite. Directions are also given verbally and the full battery can be applied over a period of one or two days. Frequent breaks are provided between different sub-tests.

After administering and interpreting these two instruments, I specifically focused on the data related to perceptual-motor development, in order to develop an intervention focusing on this facet. Thus, I strongly relied on the data obtained from bilateral integration and symmetry, hand-dominance, midline-crossing, fine motor coordination and finger isolation, perceptual skills and gross motor skills on the SRDA, and the data from Tests 1, 2, 3, 5, 6 and 7 on the ASB.

I also considered the fact that the Language of Learning and Teaching (LOLT) of the two participating schools is Afrikaans, however many learners were not fluent in the LOLT. This may have significantly affected the scores of the school readiness tests, and could possibly result in learners peforming below average on the language-related sub-tests of the ASB and SRDA tests.

3.3.5.2 Qual data collection and documentation

In order to collect and document qual data, I relied on semi-structured interviews, observation, field notes, audio and visual data documentation strategies, and a research diary (Cohen et al. 2010),

3.3.5.2.1 Semi-structured interviews, documented in the form of audio recordings, transcripts and field notes

An interview involves a two-way conversation whereby the researcher asks a participant questions in order to gain insight into the participant's ideas, beliefs, views, opinions and behaviours (Niewenhuis, 2010b). Cohen et al. (2010) regard interviews as the exchange of views between two or more people on a topic of mutual interest. An interview thus relies on the uniqueness of human interaction to obtain data and emphasise the social situatedness of data generation and the data that is obtained. According to Cohen et al. (2010), the three main puposes of an interview are: firstly to generate data that has a bearing on the research objectives; secondly to test hypotheses (if relevant) or to suggest new ones, as in this study, to support and explain QUAN data; and thirdly, in conjunction with other methods, to validate other results. I attempted to obtain rich descriptive data that could assist me in understanding the participants' construction of knowledge and their experiences of their social realities (Niewenhuis, 2010b).

More specifically, I conducted two semi-structured interviews in order to obtain data from two Grade R teachers regarding their understanding and perceptions of the Grade R curriculum, the perceptual-motor development of the learners in their classes, and the potential relationship between perceptual-motor skills and school readiness. I also explored their views on the nature and availability of resources inside and outside the classroom that could potentially hamper/support development in this

area. The interviews I conducted lasted 30 minutes each and took place after school hours at the two participating schools. The questions that guided the interviews (interview schedule) are included in Appendix C, where the analysed interviews are presented.

An advantage of interviews, according to Cohen et al. (2010), is that it can generate a great depth of rich data. As I used semi-structured interviews I was able to modify the sequence of my questions, change the wording to make it more understandable, and explain or add questions if needed - as the interviews progressed, I could thus explore the key issues in a conversational style instead of following a set pattern of questions. Furthermore, as stated by Niewenhuis (2010b), I also had the option of identifying new emerging lines of inquiry (should these have come up), that are related to the phenomenon under study which I could further explore.

According to Niewenhuis (2010b), a possible disadvantage of semi-structured interviews is the possibility of becoming side-tracked by trivial aspects that are not related to the study. Cohen et al. (2010) add that another disadvantage is the possibility of subjectivity and bias on the part of the interviewer. Finally, inadvertently important and salient topics may be omitted, and as a result of the flexibility in sequencing and wording, questions may result in alternative responses, thus reducing the compatibility of responses (Cohen et al., 2010). I guarded against these potential limitations by focusing on the purpose of the study; that being the participants' understanding of school readiness, perceptual-motor development, and the correlation between these two. However, I used pre-formulated questions as an interview guide, even though I remained flexible and allowed a conversational flow while conducting the interviews.

The data I obtained from the semi-structured interviews supported the QUAN data of the study, and guided my development of the perceptual-motor intervention. The qual data more specifically enabled me to gain insight into the Grade R teachers' understanding of perceptual-motor development, and to dissect the developmental areas that were indicated as being below average on the school readiness tests. Moreover, I was attentive to the responses of the participants (Grade R teachers) in

my attempt to identify new emerging lines of inquiry that could be directly related to the phenomenon under study (Niewenhuis, 2010b).

In order to document the data I obtained during the interviews, I used an audio-recorder after gaining permission from the participants. Following the interviews, the recordings were transcribed verbatim for data analysis purposes (refer to Appendix C). I also made field notes during the interviews, as explained in more detail in section 3.3.5.2.3.

3.3.5.2.2 Observation, documented in the form of visual data and field notes

Observation involves the methodical process of recording the behavioural patterns of participants, their objectives and occurrences without necessarily questioning or communicating with them (Niewenhuis, 2010b). Observation can be described as an everyday activity whereby one uses the senses as well as intuition to generate data. This can allow a researcher to gain a deeper insight and understanding of the phenomenon being researched (Niewenhuis, 2010b).

A distinctive feature of observation as part of a research process is that it allows the researcher to study *"live"* data in naturally occurring situations (Cohen et al., 2010: 396). This can enable the researcher to look directly at what is taking place *in situ* rather than depending on secondhand information. Morrison (1993) as cited in Cohen et al. (2010:397) in this regard state that observations can firstly enable the researcher to gather data on the *"physical setting";* in the instance of this study, on the indoor and outdoor learning environment, school terrain, and resource-constrained neighbourhood. Secondly, observation enabled me to obtain data on the *"human setting"*, as I observed the Grade R learners and Grade R teachers, their characteristics and compilation of the groups. Thirdly, it allowed me to obtain information on the *"interactional setting",* for example in terms of the interactions that took place – formal, informal, planned, unplanned, verbal or non-verbal communication and messages. Finally, I could obtain data from the *"programme setting"*, by observing available resources at the schools, and how these were organised, the pedagogic styles of the teachers, and the way in which the Grade R curriculum was presented to the learners.

I furthermore relied on observation to obtain first-hand experience on the typical day of a Grade R class in the selected schools, as part of the pre-intervention phase of the study. For this purpose, I observed the Grade R classes from the beginning until the end of the school day. I paid specific attention to class structure, resources, teacher conduct, activities and learner participation. In addition, during the pre-intervention and post-intervention assessments of the learners, the four fieldworkers and I observed the learners' reactions and approaches to complete the tasks put to them. Detailed field notes were made by both myself and the fieldworkers. I also made use of observation during implementation of the perceptual-motor intervention programme that was done by the Grade R teacher of the experimental group.

In order to document my observations, I made detailed field notes and took photographs taking on the role of *"observer as participant"* (Niewenhuis, 2010b, p.85). According to Niewenhuis (2010b), a researcher can adopt this role when looking for patterns of behaviour in order to understand assumptions or the values and beliefs of participants in the situation that is observed. Cohen et al. (2010) state that the *"observer as participant"* is known as a researcher to the group, and does not have as extensive contact with the group as the participant-observer.

Some challenges associated with observation include the fact that the researcher may be limited to certain research sites and situations where access is possible, or may experience difficulty to develop good rapport with the participants. This can happen if individuals are not familiar with formal research; for example, in a non-educational setting. Furthermore, observing in a research setting requires good listening skills and vigilant attention to visual detail, thereby emphasising the importance of certain skills of the researcher. Lastly, it requires the management of issues, such as the potential of being *"deceived"* by people who are observed, and the initial discomfort of being an *"outsider"* without personal support in an unfamiliar setting (Creswell, 2012:214). In order to overcome the potential challenges associated with observation, I compiled detailed descriptions of what I observed. I supported my field notes by taking photographs and making video-recordings. This allowed me to revisit my experiences and ensured that I had noted all my obseravtions. In addition, I established sound relationships with the participants before observing any activity, and focused on noting as much detail as possible.

3.3.5.2.3 Field notes and research diary

Any form of QUAN or qual data collection does not necessarily imply a purely technical process, but is influenced by the characteristics of the researcher and the disciplinary paradigms that are followed. It was therefore important that critical reflection formed part of this study (Gale, Heath, Cameron, Rashid, & Redwood, 2013). Cohen et al. (2010) argue that reflexivity recognises that researchers are part of the social world that they research. They bring their own accounts to the research situation and participants behave in a certain way in their presence. Reflexivity requires of researchers to recognise and reveal their own selves, being aware of the potential influence of their own biases and preconceptions on the research process. Nadin and Cassell (2006) agree with Cohen et al. (2010) by stating that the research process is subjected to a variety of influences concerning interpretations. In the current study it was thus important for me to continually take a reflexive stance and to reflect on my own experiences and my interpretation of the data.

For this purpose, I used a research diary to capture reflective notes, my impressions of the data, and my thoughts on the analysis process. In addition, I captured my field notes on observations in my research diary. To this end, I added detailed descriptions of what I had observed. I also reflected on my observations as soon as possible after each research session. As such, I compiled descriptive field notes as well as reflective field notes (Creswell, 2005) and attempted to be as accurate as possible. Descriptive field notes typically capture events, activities and people, whereas reflective notes represent personal reflections relating to insights, intuitions or broad ideas or themes that emerge during observation (Creswell, 2005).

My research diary and field notes (see Appendix D) thus allowed me to supplement the data I obtained during interviews and from observations. These allowed me to reflect on my own emotional state, and consider what was revealed about my own assumptions as the study progressed. Additionally, the diary provided me with a useful tool to keep track of the research process and to record any concerns that arose (Nadin & Cassell, 2006).

3.4 DEVELOPMENT AND IMPLEMENTATION OF THE PERCEPTUAL-MOTOR INTERVENTION PROGRAMME

Following the pre-intervention data collection phase, and analysis of the data, I developed a perceptual-motor intervention programme that would involve learners in activities that could potentially promote perceptual-motor skills development. The perceptual-motor intervention programme was designed for implementation over an eight-week period, offered for 30 minutes per day as part of the current Grade R school curriculum. The intervention was thus developed to run concurrently with the national Grade R curriculum – it did not replace the curriculum, but rather sought to enrich it. Activities were compiled according to the needs of the group, as determined during the pre-intervention phase.

The Grade R teacher of School A (experimental group) facilitated the intervention, as part of her normal planned lessons with the experimental group. My reason for having the teacher act as facilitator and not me was that I did not want to disrupt the normal flow of the class. Moreover, the learners were comfortable with their teacher and it allowed me to make detailed field notes while fulfilling the role *of "observer as participant"* (Cohen et al., 2010; Niewenhuis, 2010b). In addition, it provided me with opportunities to reflect on the activities that I designed as part of the perceptual-motor intevention programme.

According to the ASB, learners who obtain a score below the standardised score of 3 are seen as being below average (Olivier & Swart, 1988). For scores obtained on the SRDA, below 50% is seen as functioning below average (Van der Berg, 2014). Following pre-intervention assessment, I identified the domains and areas indicated in Table 3.1 as being below average, based on the data obtained during the pre-test on both the SRDA and ASB school readiness tests. As a result, these aspects became the focus of the intervention I developed.

Table 3.1: Domains and areas that indicated below average functioning by the Grade R learners at the time of the pre-test

Domain/Perceptual area	**Description**
Physical development	Eye-hand coordination
Cognitive development	Mathematical concepts, number concept, number names, symbols
Emotional development	Draw-a-man
Visual perception skills	Visual integration, visual closure, visual analysis and synthesis, visual integration
Auditory perception skills	Auditory memory, auditory analysis and synthesis, auditory closure, auditory association and classification, listening skills
Body awareness	Spatial orientation

In developing the perceptual-motor intervention programme I also specifically considered the factors around which the SRDA was designed, as the SRDA assesses the full spectrum of school readiness, with a focus on the perceptual-motor development necessary for the development of academic proficiency in language, mathematics and life skills, based on the national Grade R school curriculum. In addition, I relied on the literature review I had completed, in terms of developmentally appropriate expectations for perceptual-motor development of Grade R learners.

With this in mind I designed the perceptual-motor intervention programme, basing all activities around the notion of sensory-motor skills. I designed each activity to be executed through one of the five senses, resulting in movement; either by making use of gross motor skills or fine motor skills. Even though perceptual-motor development is complex and draws on many different developmental aspects and the related skills, the two key areas are gross motor development and fine motor development (Loubser, 2015).

Loubser (2015) further emphasises that these categories are pivotal in the development of any perceptual-motor intervention as the following perceptual-motor skills are essential for academic literacy: spatial awareness and orientation (developed through gross motor movements such as balance, posture, correct sitting

position); fine motor movements which are important for skills such as pencil-grip and leafing the pages of a book; position in space which is important for the positioning of letters; midline crossing (playing a pivotal role in being able to read and write from left to right); and directionality and laterality which are crucial when starting to read and writing from the top to the bottom of the page, and from left to right.

Temporal awareness (the inner and outer sense of time) was also integrated into the development of the perceptual-motor intervention programmes as rhythm creates fluidity in speaking, writing and reading; and coordination is important in eye-hand coordination (Loubser, 2015). Lastly, coordination and sensory awareness were integrated in terms of visual and auditory perception, and memory activities were relied on to teach children to remember letters, words and sentences that are seen and heard. Matching and/or discrimination activities supported learners in becoming able to recognise similarities and differences in letters and words through sight and hearing, while visual closure activities focused on closing a letter or completing word activities (Loubser, 2015).

The main purpose of the perceptual-motor intervention was to enrich the current Grade R curriculum in order to support learners' levels of school readiness. During implementation of the intervention minor adjustments were made to accommodate learners' abilities, development and progress. I furthermore designed the activities in such a way that available apparatus and resources could be used to achieve set goals. As the Grade R teacher of the experimental group acted as the facilitator of the intervention, I first explained each activity in detail to her as well as the outcome and aim of the activity. All activities were designed with a weekly theme in mind. Throughout, I took on the role of observer and made detailed notes.

A typical lesson of the intervention consists of a warm-up activity or introduction. All activities were presented in groups and learners rotated until all learners had an opportunity to take part in the activity. Some activities took place outside the classroom, whilst other took place in the classroom. Progress in the programme could gradually be observed as learners developed and progressed. In Table 3.2, I include the third week's planning and outline as an example. The complete intervention is included as Appendix E.

Table 3.2: Week 3 of the perceptual-motor intervention programme

Week 3:		
Focus	**Equipment**	**Activity**
Auditory analysis and synthesis	Chalk Hop scotch	Warm up: children sing a song applicable to the theme of the week. Make use of body percussion while singing the song. Children are taken outside. Hopscotch design is drawn on paved area. Children must jump while sounding their names, e.g. Lin-di-we.
Eye- hand coordination	Kebab sticks Take away containers Fruit loops	Warm up: Children make a circle, sing an action song. Make use of movements. Each child gets a take-away container with three kebab sticks stuck in (each stick is numbered 8, 9 or 10). Children must pick up one-by-one fruit loops and "string" them onto a stick according to the number, e.g. the number 8 stick gets 8 fruit loops.
Visual integration	Paper plates with holes punched in, numbered 1-6	Spider webs: children draw spiders in the middle of paper plates. Thread wool from one hole to a hole on the opposite side of the paper plate. Move to the next hole and repeat.
Visual closure	Visual closure puzzles Visual closure (semi-concrete) worksheets Crayon pencils	Warm up: teacher instructs learners, "sit on the ch… (Chair)" etc. Learners fit halves together to complete a picture (visual closure puzzle). After this activity has been completed, they are provided with a worksheet to complete images.

3.5 DATA ANALYSIS

In this study I followed a sequential data analysis process based on the selected research design and methodological approach. My analysis of the QUAN data was used to guide my analysis of the qual data, with the latter supplementing the former (Creswell & Plano Clark, 2007).

3.5.1 QUAN data analysis

Maree and Pieterse (2010b) define quantitative research as a methodical and objective process of using numerical data from a selected sample of a population, in order to generalise findings. Even though Creswell (2012) believes that the quantitative researcher firstly needs to identify a research problem based on what is happening in the field or on the need to explain why something occurs, some

quantitative research problems require that a researcher also explains how one variable affects another. Variables can be regarded as the attributes or characteristics of individuals that researchers study.

In this study, I attempted to explain the relation between a perceptual-motor intervention and the school readiness levels of Grade R learners from resource-constrained settings. The QUAN data were collected by means of the ASB (standardised) and the SRDA (not standardised). A pre-test/post-test control group strategy was used to analyse the QUAN data. More specifically, I used descriptive statistics to analyse the data in order to organise and summarise the data in a significant way (Pietersen & Maree, 2010a).

Statistical comparisons were made between the ASB and SRDA scores of the experimental and control group before and after the intervention, in which only the experimental group took part. This was done to determine the extent to which the different groups of Grade R learners were similar or different in terms of levels of school readiness. To this end, I analysed data between and within the two schools[12] by comparing the total scores of each of the two schools during Phase 1 and 3 of my study, as shown in Figure 3.5.

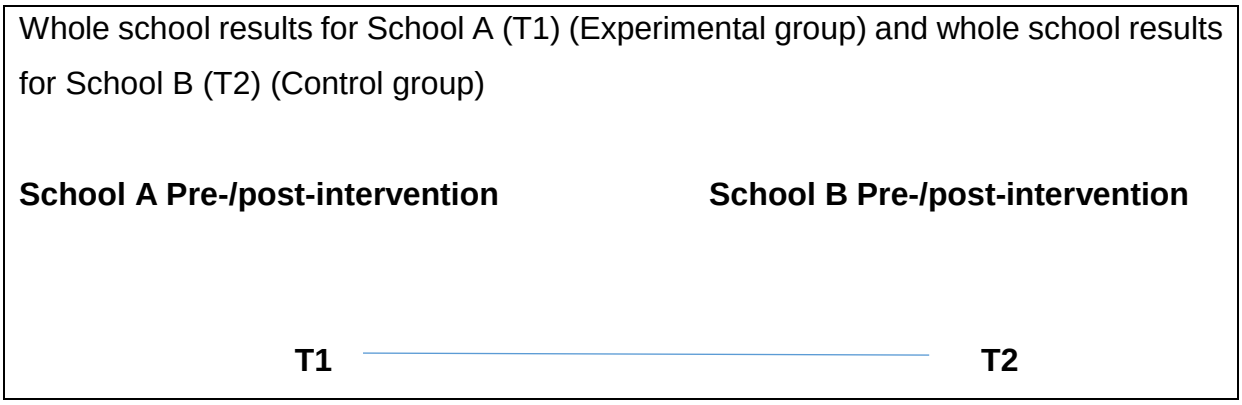

Figure 3.5: Between schools comparison of results (pre- and post-intervention)

The following statistical procedures and comparisons were carried out with the assistance of the Department of Mathematical Statistics and Actuarial Sciences of the University of the Free State:

[12] For the sake of confidentiality, I refer to the two schools as School A and School B.

- Frequencies and corresponding percentages of the ASB scores were tabulated per school for each of the sub-tests, both pre-intervention and post-intervention.
- Descriptive statistics (mean, standard deviation, minimum, median and maximum) were tabulated for the ASB scores per school for both pre-intervention and post-intervention.
- Descriptive statistics were tabulated for the average ASB score (average over the eight sub-tests) per school for both pre-intervention and post-intervention, as well as for the difference between the average pre-scores and average post-scores.
- The SRDA scores for each of the perceptual skills were averaged within the domains of the instrument. The seven domains were analysed further, including the pre-intervention and post-intervention averages of all domains.
- Descriptive statistics (mean, standard deviation, minimum, median and maximum) were tabulated for the SRDA domain averages, per school and for both pre-intervention and post-intervention.
- Descriptive statistics were tabulated for the average SRDA score (average over the seven domains of the test) per school and for both pre- and post-intervention, and for the difference between the average pre-scores and post-scores.
- In assessing the effect of the perceptual-motor intervention on the ASB and SRDA scores, the average pre-scores and post-scores were analysed using ANOVA (pre-scores) and ANCOVA (post-scores) with school as main effect, and the corresponding pre-score as covariate.

Analysis of variance (ANOVA) was used to analyse the pre-intervention scores and to make comparisons between the experimental and control groups in order to see if they differed on the outcome variable - in this instance, school readiness (Blaikie, 2003; Lombaard, 2014; Salkind, 2008). Analysis of covariance (ANCOVA) was utilised in this study as it permits the comparison of group means on a dependent variable after the group means have been adjusted on a relevant covariate variable (Morgan, Reichert & Harrison, 2002). Furthermore, ANCOVA is regarded as suitable for this study as more than two means were compared (Salkind, 2008); namely, school readiness levels of Grade R learners that formed part of an experimental and control group before and after a perceptual-motor intervention. Also, ANCOVA is often used in a pre-test/post-test experimental design, using the pre-test as a covariate and the post-

test as response (Fancher, 2010). To this end, ANCOVA was used to analyse the post-intervention scores between schools.

3.5.2 Qual data analysis

Qualitative data analysis involves organising, accounting for and explaining data, thus creating an understanding of the participants' definitions of situations, noting patterns, themes, categories and regularities (Cohen et al., 2010). Niewenhuis (2010b) states that qualitative data analysis is usually based on the interpretivist philosophy which focuses on examining meaningful and symbolic content of qualitative data. In other words, *"it tries to determine how participants make meaning of specific phenomenon by analysing their perceptions, attitudes, values, feelings and experiences" (*Niewenhuis, 2010b, p.99).

I conducted thematic inductive content analysis of the qual data I obtained. Thematic induction implies inferring general rules or classes from specific instances (Terre Blanche, Durrheim & Kelly, 2006), and identifying themes and related sub-themes. Creswell (2005) describes such themes as similar codes that are aggregated together to form a main idea. Inductive analysis involves a systematic approach that identifies and summarises messages in content (Niewenhuis, 2010b). It is a process of looking at the data from different angles with the purpose of finding different meanings in the text that can assist in understanding and interpreting the raw data (Niewenhuis, 2010b).

In conducting my analysis, I followed the steps proposed by Niewenhuis (2010a) and Terre Blanche, Durrheim & Kelly (2006). Here, I first coded the data by reading and re-reading through the transcribed data and visual data, and dividing it into meaningful analytical units or segments. Next, I established themes or categories, following an inductive approach. Finally, I verified the categories or themes by checking whether or not information had been captured correctly. Braun and Clarke (2006) describe these steps in more detail and provide a step-by-step guide to conduct thematic analysis, as summarised in Table 3.3.

Table 3.3: Steps in thematic analysis (Braun & Clarke, 2006:87)

	Phase	Description of the process
1	Familiarising oneself with the data	Transcribing data, reading and re-reading the data, observing initial ideas.
2	Generating initial codes	Coding thought-provoking features of the data in a methodical way acro ss the data set, arranging data relevant to each code.
3	Searching for themes	Collating codes into potential themes, collecting additional data relevant to each theme if required.
4	Reviewing of themes	Checking if the themes match the coded excerpts, constructing a thematic map of analysis.
5	Defining and naming themes	Continuing analysis to improve specifics of each theme and the overall story the analysis tells, producing clear definitions and names for each theme.
6	Producing the report	Selecting rich, convincing excerpt examples, final analysis of selected excerpts, relating analysis back to the research question and literature.

According to Niewenhuis (2010a), qualitative data analysis as a process tends to be ongoing and iterative. This implies that data collection, processing, analysis and reporting are intertwined and do not merely entail a number of successive steps. Niewenhuis (2010b) states that this implies that in qualitative studies, researchers often need to go back to the original field notes to verify their analysis, or add additional data when required. Therefore, it may happen that, when a researcher reflects on the data that had been collected, she or he may notice gaps in the data, requiring of her/him to go back and collect additional data (Niewenhuis, 2010b). Seidel (1998), cited in Niewenhuis (2010b), developed a model that explains this iterative process of qualitative data analysis, as summarised in Figure 3.4.

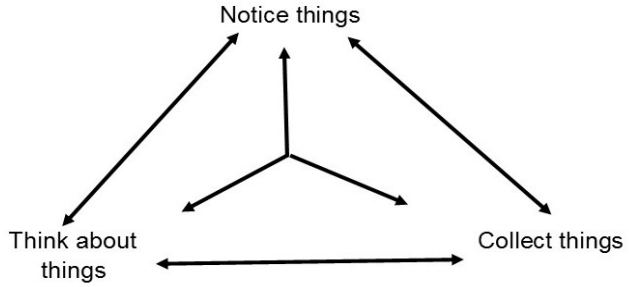

Figure 3.6: The qualitative data analysis process taken from Seidel (1998), cited by Niewenhuis (2010b)

Thematic analysis can thus be seen as a relatively low-cost and flexible method of analysing qualitative data. It is specifically useful when working with a large body of data. As it involves a summative description of the data set, thematic analysis can highlight similiarities and differences across a data set, and also indicate unexpected insights. However, possible limitations and challenges include the fact that thematic analysis could have limited explanatory power beyond that of description if it is not used within a theoretical or conceptual framework that grounds the analytical claims that are made (Braun & Clarke, 2006). As such, I utilised thematic analysis in order to address the research questions, against the background of my conceptual framework.

3.6 QUALITY ASSURANCE

Koonin (2014) states that validity and reliability in research can almost be related to the way in which humans develop trust in other people. Validity and reliability are mostly used in quantitative research, as it relates to the measurability of results. However, Koonin (2014) states that validity and reliability are not deemed unimportant in qualitative research, but that different terminology is merely used, referring to trustworthiness, which implies credibility, transferability, dependability, conformability and authenticity. Creswell and Plano Clark (2007) assert that it is important to report issues around validity from within the context of both quantitative and qualitative research when conducting a mixed-methods study.

3.6.1 Quantitative quality assurance

In this section I discuss the reliability and validity of the quantitative data and the analysis I completed.

3.6.1.1 Reliability of quantitative data

According to Durrheim and Painter (2006), reliability refers to the dependability of a measurement instrument. This indicates the extent to which an instrument will produce the same results over repeated trials. The higher the reliability of a test, the smaller the difference between testees' scores when test is repeated.

In terms of the reliability of the ASB (Olivier & Swart, 1988), the test was compiled as the measuring instrument for the evaluation of certain aptitudes which are important

in elementary education. The purpose of the test is to obtain a differentiated picture of certain aptitudes of school-beginners. In establishing the norms of the ASB, the test was applied to a representative sample of 1796 school-beginners. The school-beginners were randomly chosen from a representative sample of 109 schools. The reliability coefficients obtained for the various sub-tests of the ASB are indicated in Table 3.4.

Table 3.4: Reliability and standard error of measurement of the ASB i.e. N=1851 (taken from Olivier & Swart, 1988, p. 45)

Test number	Name of test	Maximum of test	Reliability (K-R 20)*	Standard error of measurement	
				Raw score	Standard score
1.	Perception	10	0.77	0.83	0.48
2.	Spatial	10	0.82	1.17	0.43
3.	Reasoning	10	0.81	1.08	0.44
4.	Numerical	10	0.74	1.14	0.51
5.	Gestalt	100	0.91**	6.53	0.30
6.	Co-ordination	30	0.83**	2.74	0.41
7.	Memory	10	0.93	0.86	0.26
8.	Verbal Comprehension	20	0.75	1.66	0.50

**Calculated according to Kuder-Richardson formula 20*

***Calculated according to Ferguson's adaptation of the K-R formula 20*

The standard error of measurement shows the fluctuation in test scores which could be due to chance factors. According to Olivier and Swart (1988), if for instance, the standard error measurement is 1 and a learner achieves a raw score of 6 on a test, it means that in a repeated application of the test, the learner will obtain scores of between 5 and 7 on two out of three occasions.

When a number of items are formulated to measure a certain concept, a high degree of similarity should exist between them, as the items are supposed to measure a common concept (Pietersen & Maree, 2010a). The reliability and standard error of measurement of the ASB was calculated according to *Kuder-Richardson formula 20.* The scores for KR-20 range from 0 to 1, where 0 implies no reliability and 1 perfect reliability. The closer the score is to 1, the more reliable the test. Table 3.5 summarises

the reliability (internal consistency) that was recorded for the ASB for the current study by making use of the *Cronbach's Alpha Coefficient.*

Table 3.5: Reliability of the ASB pre- and post-test

Cronbach Alpha Coefficient Pre-test		**Cronbach Alpha Coefficient Post-test**	
Variables	**Alpha**	**Variables**	**Alpha**
Raw	0.76	Raw	0.79
Standardised	0.74	Standardised	0.8

The *Cronbach Alpha Coefficient* was used as it is constructed on inter-item correlations. Pietersen and Maree (2010a) state that if items are strongly correlated and the internal consistency (reliability) is high, the alpha coefficient will be close to one. If this is not the case, and items are formulated well and do not correlate strongly, then the alpha coefficient will be close to zero. These authors (Pietersen & Maree, 2010a) provide generally accepted guidelines for interpretation of the *Cronbach Alpha Coefficient*, stating that 0.90 indicates high reliability, 0.80 moderate reliability and 0.70 low reliability. As indicated, the *Cronbach Alpha Coefficient* for the eight tests on the ASB was 0.745156 pre-test and 0.800221 post-test for my study. This means that the ASB recorded a moderate-to-high reliability.

In terms of the reliability of the SRDA a scale was developed by Van der Berg (2014) to measure the school readiness levels of Grade R learners. The test consists of seven sub-tests that are each divided into several smaller tests. The *Cronbach Alpha Coefficient* for the averages of the seven domains on the SRDA was 0.852787 for the pre-test and 0.751552 for the post-test. This means that the SRDA also recorded a moderate-to-high reliability. Table 3.6 summarises the reliability (internal consistency) of the SRDA that was recorded for this study by making use of the *Chronbach's Alpha Coefficient.*

Table 3.6: Reliability of the SRDA pre- and post-test

Cronbach Alpha Coefficient Pre-test		**Cronbach Alpha Coefficient Post-test**	
Variables	**Alpha**	**Variables**	**Alpha**
Raw	0.85	Raw	0.79
Standardised	0.85	Standardised	0.75

3.6.1.2 Validity of QUAN data

Validity refers to that property of an assessment tool which indicates that the instrument does what it says it does (Salkind, 2008). Koonin (2014) similarly states that validity indicates the extent to which the instrument that was selected by a researcher will reflect the reality of the constructs that are measured. A good question to ask when determining validity would be whether or not the findings reflect what is happening in a given situation. Validity is distinguished in terms of internal and external validity (Maree & Pietersen, 2010a).

In line with the single case experimental design that I selected for my research, the experiment is expected to indicate a high degree of both external and internal validity. According to Maree and Pietersen (2010a), internal validity implies that sufficient control has been managed over the variables other than (in this study) the perceptual-motor intervention, consequently concluding that the perceptual-motor intervention mostly produced a change in the dependent variable; in this instance the school readiness levels of Grade R learners. Factors that may threaten internal validity, as well as a summary of the strategies I employed in an attempt to avoid these (threats), are summarised in Table 3.7.

Table 3.7: Factors threatening internal validity and steps taken to enhance internal validity of the QUAN data set (Maree & Pietersen, 2010a)

Threat	Description	Strategy
History	Factors unplanned for that may be present between the pre- and post-test.	The pre-test took place immediately before the intervention, and post-test directly after the intervention.
Selection	The way in which experimental and control groups are composed that may influence the final results.	Both experimental and control groups were selected from a similar context; in this instance, being Grade R learners from resourced-constrained settings attending quintile 2 primary schools.
Maturation	Physical, emotional, social and cognitive changes in participants that occur over time and could influence the results of a study.	Participants were all Grade R learners, all of them being 6 turning 7 in the coming year. Data collection took place over four months in the same year.
Mortality	Some respondents not continuing throughout the experiment.	During the post-test phase, 12 learners from the control group did not return to school. In order to assess whether the learners with missing post-scores differed from the learners with available post-scores with regard to their aptitude, the average pre-scores of the two groups of learners were compared using an analysis of variance approach (ANOVA) with the factors being school and presence of post-data. None of the two factors was statistically significant which suggests that there might not have been systematic differences regarding the aptitude of learners with and without post-scores respectively.

According to Tredoux and Smith (2006), a study will indicate external validity when its findings or conclusions can be generalised beyond the research. The researcher will in this case be able to generalise the results from the sample to a broader population (Koonin, 2014). External validity for this study was established by means of content validity, criterion-related validity and construct validity.

According to Salkind (2008), c*ontent validity* is reached when a sample of items truly reflects a whole universe of items in a certain topic. Cohen et al. (2010) state that for this form of validity, an instrument must show that it covers the domain or items that it is supposed to cover. In both school readiness tests that were utilised in this study, content validity was adhered to, as both tests assessed the full spectrum of school readiness in all its different domains.

Criterion-related validity refers to the degree to which a measure is related to another standard or criterion that is known to show the construct accurately (Durrheim & Painter, 2006). Salkind (2008) agrees that criterion-related validity reflects a set of abilities in a current or future setting. If the criterion is taking place here and now, it is referred to as concurrent criterion validity; if the criterion is taking place in the future it is referred to as predictive concurrent validity. The ASB is a standardised school readiness test of which concurrent and predictive validity have already been established (Olivier & Swart, 1988). The SRDA test scores correlated with the ASB scores, indicating implied criterion-related validity. An important aspect related to concurrent validity is *triangulation* which is defined as the use of two or more methods of data collection (Cohen et al. 2010), as explained in the next session.

Finally, *construct validity* is based on an underlying construct or idea behind a measuring tool. Here a construct is seen as a group of inter-related variables (Salkind, 2008). For example, school readiness can be seen as a construct consisting of such variables as physical development, perceptual-motor development, emotional development, cognitive development and social development. These constructs are generated from the theoretical position a researcher assumes (Salkind, 2008). Durrheim and Painter (2006) concur by stating that the construct validity of a measure involves both empirical and theoretical work, thus seeking relationships between differently associated theoretical associated constructs. Construct validity in this study was determined by confirming the constructs with relevant literature (Cohen et al. 2010).

3.6.2 Triangulation

Kelly (2008b) defines triangulation as gathering material in many different ways and from as many different sources as possible. Closely related, Cohen et al. (2010, p.141)

state that triangulation techniques attempt "*to map out, or explain more fully, the richness and complexity"* by studying it from more than one position. In my study I made use of both quantitative and qualitative data. The qualitative data supported the quantitative results I obtained from the school readiness tests. This concurs with the statement of Cohen et al. (2010) that when the results of an experimental investigation are supportive by qualitative data, triangulation is implied. In mixed-methods research, triangulation thus supports the choice to use both quantitative and qualitative methods to obtain more valid conclusions about the phenomenon that is being studied. This is done by comparing the results of the data sets, through convergence and divergence (Plano Clark & Ivankova, 2016). In my study, the results from the QUAN and qual data sets were thus utilised and compared in order to increase validity through verifying the QUAN results by means of the qual results. Divergence implies that when comparing the results, these were contradictory.

Triangulation is considered as an effective way of utilising the benefits of both quantitative and qualitative methods. It can increase the credibility of scientific knowledge by improving internal consistency and generalisability through the combination of quantitative and qualitative methods (Yeasmin & Rahman, 2012). Different types of triangulation and their related charateristics are summarised in Table 3.8.

Table 3.8: Types of triangulation and their related characteristics (Cohen et al. 2010; Kelly, 2006b)

Type of Triangulation	**Characteristics**
Time Triangulation	This type of triangulation tries to consider the aspects of change and process e.g. making use of cross-sectional and longitudinal designs.
Space Triangulation	This type of triangulation makes use of cross-cultural techniques in an attempt to overcome narrowness of studies conducted in the same country.
Combined levels of Triangulation	Here, more than one level of analysis from the social sciences is used: the individual level, interactive level (groups) and level of collectives (organisational).
Theoretical Triangulation	This type of triangulation draws on alternate or opposing theories in preference to utilising only one viewpoint.
Investigator Triangulation	This type of triangulation makes use of more than one observer, data is thus gathered independently by more than one observer.
Methodological Triangulation	This type of triangulation uses either the same method on different instances, or different methods on the same object of a study.

For the purpose of this study, I focused on methodological triangulation. Triangulation within methods, as argued by Cohen et al. (2010) implies a check on reliability and theory confirmation. Triangulation between methods thus entails the pursuit of a given objective, involving more than one method, which provides a check on validity (Cohen et al. 2010). Yeasmin and Rahman (2012) state that by utilising multilple methods, the prospect of ehanced confidence is possible. These authors futhermore argue that the deficiencies of using only one method can be overcome by combining methods, thus capitalising on the individual strengths of different strategies (Yeasmin & Rahman, 2012). Additionally, Yeasmin and Rahman (2012) indicate that triangulation implies authentication that can increase validity by combining several viewpoints and methods.

In this study, triangulation of QUAN and qual methods and data resulted in an increased depth and understanding of the phenomenon under investigation (Yeasmin & Rahman, 2012) An advantage of triangulation that I could rely on, is being confident about the results I obtained (Cohen et al. 2010; Yeasmin & Rahman, 2012.). However,

a potential challenge of triangulation is that, if a study is not clearly focused theoretically or conceptually, it may not produce a satisfactory outcome. It was therefore important that I present each selected method in a significant way, and remained focused on the purpose of my study, against the selected theoretical background and conceptual framework (Yeasmin & Rahman, 2012).

3.6.3 Qualitative data assurance

In qualitative studies, quality is ensured through rigour that implies confidence and trust about a study and its findings. Trustworthiness is pivotal in qualitative research and taken as the overarching factor for quality, that implies credibility, transferability, dependability, confirmability and authenticity (Koonin, 2014).

3.6.3.1 Credibility

Credibility refers to the accuracy with which a researcher has interpreted the data provided by the participants (Koonin, 2014). In this study, I aimed to enhance credibility by spending sufficient time with the participants in order to understand their experiences and context, and gain insight into their perceptions. An important technique for establishing credibility is through member checking. This is done by showing participants materials such as interview transcripts and identified themes and sub-themes, asking them to confirm or adjust these as required (Seale, 1999). According to Van der Riet and Durrheim (2008), the credibility of qualitative research is established during the research process itself, with the researcher continually looking for discrepant evidence in order to produce rich and credible results. Another way of establishing this is to use triangulation, which I also employed, as discussed in the previous section.

Lincoln and Guba (1985, p.192) cited in Cohen et al. (2010, p.136) similarly suggest that credibility can be addressed by "*Prolong engagement in the field, persistent observation, triangulation",* and "*member checking".* In this study, data collection took place over a 6-month period, through multiple methods of data collection, including observation. I thus used interviews to gain an understanding of the Grade R teachers' understanding of what perceptual-motor development entails as well as their understanding of the term school readiness and the link between perceptual-motor

development and school readiness, and then triangulated the data I obtained by taking on the role of participant observer during the implementation of the perceptual-motor intervention, making detailed field notes, taking photographs and videos clips, and keeping a research diary. Furthermore, I provided the teacher-participants with the transcripts of the interviews I conducted with them, in order for them to check whether or not they agreed. I also indicated the themes and sub-themes I identified, as part of the member-checking sessions, giving them the opportunity to add or agree on these themes and sub-themes.

3.6.3.2 Transferability

Transferability relates to the generalisability of findings following a qualitative study (Van der Riet & Durrheim, 2008). Transferability therefore implies the option of applying findings to a similar situation and delivering similar results (Koonin, 2014; Shenton, 2004). Kelly (2008a) states that transferability provides the option of providing answers in other similar contexts. Based on my selected methodology, I did not aim to obtain generalisable findings (as this is not the purpose of interpretivism or case study research) yet transferability may be an option (Van der Riet & Durrheim, 2008).

Even though Shenton (2004) asserts that the findings of qualitative projects are specific to small samples, both Shenton (2004) and Morse (2015) also indicate that a researcher can enhance transferability by providing sufficient contextual information about research sites and the research process in order to enable the reader to make such transfer as she or he sees fit. Both Shenton (2004) and Morse (2015) add that it is important to provide thick descriptions of the phenomenon under investigation, for readers to gain a proper understanding of and thereby be able to compare the phenomenon reported on with other potential studies and contexts.

In the case of my study, I included detailed descriptions of the research. As already stated, I aimed to find answers to *"what is unique about this group, situation or issue?"* (Niewenhuis, 2010a, p.94) rather than to provide generalisable findings. However, the findings of this study may be transferable to similar studies.

3.6.3.3 Dependability

Dependability relates to the quality of the process of integration between the data collection method, data analysis procedure, and the theory generated from the data (Koonin, 2014; Seale, 1999). According to Seale (1999, p.156), an important aspect of dependability is that of *"showing data"* to the reader. Dependabilty can thus be ensured by providing rich and detailed descriptions that indicate how actions and opinions are ingrained in and developed from contextual information. Dependability can also be achieved by providing the reader with information on the methods used (Van der Riet & Durrheim, 2006). This may allow readers to be able to evaluate the data on which codes, schemes, concepts and conclusions are based. Van der Riet and Durrheim (2006) concur with Seale (1999) that dependabilty entails the degree to which a reader can be persuaded that the findings are indeed based on what the researcher reports.

In this study, I documented the entire research process in detail and included a trail of evidence of the thematic analysis I conducted (included in the appendices). This audit trail consists of records which include analysed transcripts of the semi-structured interviews, photographs, field notes and a research diary (Appendices C and D).

3.6.3.4 Confirmability

Confirmability is explained by Koonin (2014) as an indication of how well data had been collected to support the findings and interpretations of the researcher. It furthermore indicates how well the findings flow from the data. According to Shenton (2004), the concept of confirmability can be related to a researcher's concern to remain objective, therefore ensuring that the findings are the result of the experiences and thoughts of the participants rather than the partialities or biased interpretations of the researcher. Here, the role of triangulation, as it was uitilised in this study, promotes confirmability as it can reduce the effect of researcher-bias.

In order to enhance confirmability, detailed methodological descriptions may enable the reader to review what had emerged from the data. Critical to this process is an audit trail, which can allow any observer to trace the course of the research and data analysis process step-by-step (Shenton, 2004). As already indicated, I have included

an audit trail, by audio-recording the interviews I conducted with the Grade R teachers and then transcribing them. This resulted in obtaining a verbatim account of what the participants said, supported by detailed field notes as well as photographs and video recordings. My analysis of these is described in detail in this thesis; and examples can be viewed in the relevant appendices.

3.6.3.5 Authenticity

According to Seale (1999), authenticity is implied when a researcher can demonstrate that fairness has taken place. Any study should allow readers to develop more *"sophisticated understandings"* of the phenomenon being studied. This implies that the reader may gain insight and appreciate the viewpoints of others *("educative authenticity"*), demonstrate a stimulated form of action (*"catalytic authenticity"*) and become empowered to act ("*tactical authenticity*").

I attempted to remain aware of all aspects of authenticity, by monitoring the authenticity of the data throughout by keeping and reporting detailed and thick descriptions of how the participants took part in the perceptual-motor intervention and their experiences thereof. I also include quotations of teachers' understandings and their views on school readiness and the correlation to perceptual-motor development (refer to the next chapter).

3.7 ETHICAL CONSIDERATIONS

Plano Clark and Ivankova (2016) state that knowledge-generation is a collaborative process and requires collegial interactions among many stakeholders. This has an influence on how a study is designed, implemented and reported. Researchers need to adhere to ethical norms and principles when conducting research with human beings; and must pay careful consideration to address the needs of different study populations. This is mainly done for the purpose of not harming any participants (Creswell, 2010). For this study, I was directed by the guidelines stipulated by the Ethics Committee of the Faculty of Education, University of Pretoria (https://www.up.ac.za/en/faculty-of-education/article/30611/research-ethics).
In compliance with this, I attended to the principles of anonymity and confidentiality, trust, voluntary participation and informed consent.

3.7.1 Permission to conduct research and voluntary participation

Creswell (2013) states the importance of obtaining ethical clearance from the relevant board and university (if applicable) before embarking on a study. My proposed research was approved by the Ethics Committee of the Faculty of Education, University of Pretoria in 2016, before I commenced with the study. In addition, the Free State Department of Education provided permission for my research to be conducted in the selected primary schools in the Mangaung Municipal District (Appendix A).

According to Cohen et al. (2010), informed consent relates to participants' rights to freedom and self-determination. Consent thus protects and respects the rights of the participant. Diener and Crandall (1978), cited in Cohen et al. (2010), describe informed consent as the processes during which individuals decide whether or not to participate in an investigation after being educated of the facts that would potentially influence their decisions. This definition involves four elements*: "competence"* which implies that the participant will make correct decisions if correct information is provided. Secondly, *"voluntarism"* which entails applying the principle of informed consent and the participant having the right to freely choose whether or not to participate. Thirdly, *"full information"* indicating that participants must be informed about everything regarding the research project; and lastly *"comprehension"*, referring to the fact that participants need to fully understand the nature of the research project (Cohen et al. 2010, p.52).

In the case of participating learners, I obtained informed assent in addition to the consent I obtained from their parents/guardians/caregivers. Nairn and Clark (2012) confirm that *"assent"* implies a child's agreement to participate in research in circumstances where she or he is not old enough to give consent. They recommend that researchers should attend to the opinions and views of children who are not able to give full consent, to ensure that they agree to participate. This consent/assent process must endorse and safeguard the dignity, privacy and confidentiality of both the child and family members. As stated, I thus obtained written informed consent from the parents and the two Grade R teachers as well as informed assent from the learners themselves before I commenced with data collection (refer to Appendix B.

Autonomy is defined by Milligan and Jones (2016) as the condition where a person acts voluntarily from a position of knowledge and understanding. To give voluntary

"informed consent" thus implies that participants exercise their free will without being coerced into participation. The participants in this study were provided with a sense of autonomy as their rights were constantly respected and acknowledged by myself and my fieldworkers. All participants were provided with relevant information regarding the study before participation, and were also informed that they may withdraw their participation at any time without being disadvantaged in any way.

3.7.2 Confidentiality, anonymity and respect for privacy

A participant's right to privacy must be protected throughout any research study. This can be done through confidentiality (Cohen et al. 2010) implying that, although the researcher knows who has provided the information or is able to identify participants from the information that is provided, he or she will not make this information public. Anonymity as stated by Cohen et al. (2010) implies that no information provided by participants will reveal their identity. In other words, confidentiality and anonymity of information should always be protected, and no information may be used other than that for which permission had been obtained from the participants.

Closely related to confidentiality and anonymity is the researcher's responsibility to safeguard participants' privacy. The right to privacy defines that a person has the right not to take part in research, not to answer questions, and not to be interviewed. Privacy thus implies *"freedom from"* as well as *"freedom for"* (Cohen et al. 2010, p.64).

Throughout the study I carefully considered whether or not any data that I include may violate participants' anonymity; and avoided this at all times (Chowdhury, 2014). I maintained confidentiality and ensured that all recorded data are stored in a safe place at the University of Pretoria (UP) as required by the ethical guidelines for research. I also respected the privacy of the participants at all times.

3.7.3 Trust

Creswell (2012) states that qualitative research may ask of participants to discuss private detail or personal life experiences. This process requires a high level of trust based on participant disclosure. Trust can easily be broken by deception, implying the

risk of gathering information that is irrelevant to a study (Cohen et al. 2010). It is therefore of utmost importance to remain truthful to participants throughout a study.

The participants in this study were made aware of the purpose of the study and the research process prior to data collection. No deception was involved and all participants were informed in a clear manner about what their participation would entail, guarding against creating any form of stress among them. Throughout the research study I maintained a relationship of trust between myself, the fieldworkers and participants of the study. I valued the role they played in the research process and paid attention to maintaining sound relationships, based on good rapport. I also continually reflected on my views and perceptions as researcher, being aware of the possible effect of power relationships.

3.7.4 Protection from harm

Researchers may not harm participants in any way. According to Louw (2014), harm in social research may include the following: participants recalling emotional painful memories; asking questions in a group setting that may cause a participant to be embarrassed; creating situations where a participant's future prospects may be hindered; or conducting discussions in a way that a participant may feel his or her contribution is less intelligent, relevant or valuable than those of other participants.

It is critical for researchers to remain sensitive about the issues mentioned above. Researchers thus need to be clear in advance, before participants give consent, about the exact nature of a study and what kinds of sensitive information may be explored (Louw, 2014). In my study, I remained aware of the participants' well-being, and I did not include any procedures that could impose physical or psychological harm to child or adult participants (Berk, 2001). Where I identified potential areas that could have required professional intervention, I referred the child to a counsellor or educational psychologist (McDevitt & Ormrod, 2013).

3.8 CONCLUDING REMARKS

In this chapter I discussed the research process and methodological strategies I used. I explained my paradigmatic choices, research design, and specifically the way in

which I integrated QUAN and qual components in order to complete a mixed-methods study. I also stated the steps I used to enhance reliability, validity and trustworthiness of the study, and explained how I conducted ethical research.

In Chapter 4, I present the results of my study following the QUAN and qual analysis I completed. I furthermore indicate how the qual data supported and enriched the QUAN results.

CHAPTER FOUR:

RESULTS OF THE STUDY

4.1 INTRODUCTION

In Chapter 3, I discussed the research process, design and methodological strategies employed in this study. My discussion was framed considering the purpose of my study; namely, to explore the effect of a perceptual-motor intervention programme on the school readiness levels of Grade R learners from resource-constrained settings.

In this chapter, I present the results of both the QUAN and qual data sets for pre-intervention and post-intervention. To this end, I first present, discuss and compare the QUAN data obtained by means of two school readiness tests I employed, pre- and post-intervention. I then discuss the qual data in terms of the themes and sub-themes which I identified during inductive thematic analysis.

4.2 DISTRIBUTION OF QUAN DATA AND SAMPLE SIZE

Information regarding the frequencies for each of the two groups, pre-intervention and post-intervention, are provided in Tables 4.1 and 4.2 below. Table 4.1 shows the number of Grade R learners who formed part of the sample involving pre-intervention. A total of 58 Grade R learners (n=58) were assessed during the pre-intervention assessment by making use of the ASB and SRDA. Table 4.2 shows the number of learners assessed after the perceptual-motor intervention had been completed by making use of the ASB and SRDA. A total of 43 Grade R learners (n=43) were assessed.

Table 4.1: Number of participants for each of the two groups, for pre-intervention

Group	**Total**
School A (pre-intervention)	33
School B (pre-intervention)	25
TOTAL	**58**

Table 4.2: Number of participants for each of the two groups, post-intervention

Group	**Total**
School A (post-intervention)	31
School B (post- intervention)	12
TOTAL	**43**

Because there was a significant number of missing values for the post-intervention scores, an analysis of covariance was conducted. The number of learners with average pre-test scores (scores for all 8 sub-tests of the ASB available) was 33 in School A and 25 in School B. The corresponding numbers for the post-test scores were n=31 for School A and n=12 for School B. The reason for the attrition in numbers was that, when the post-intervention ASB test was conducted, learners had not returned to school after their end- of-year school function. In order to determine whether or not the leaners with missing post-intervention scores differed from the learners with available post-intervention scores in terms of their aptitude scores. Thus, the average pre-intervention of the two groups of learners were compared, using a two-way analysis of variance (ANOVA) with the factors School and Presence, with post-data. The factor *presence* was not statistically significant (P=0.6839). As p>0.05, no systematic difference was indicated regarding aptitude, between learners with and without post-intervention scores, respectively.

4.3 PRE-INTERVENTION QUANTITATIVE RESULTS

Descriptive statistics is a collective name for a number of statistical methods that are used to organise and summarise data in a significant way (Pietersen & Maree, 2010). Tables 4.3 and 4.4 provide descriptive statistics, tabulated for the ASB and SRDA scores for School A and School B, both pre-intervention and post-intervention. Furthermore, descriptive statistics were tabulated for the average ASB score; that is the average over the eight sub-tests, by school and for both pre-intervention and post-intervention, and also for the difference between the average pre- intervention and post-intervention scores. These scores are provided in Table 4.3.

Table 4.3: Descriptive statistics for pre-intervention scores for the results of the ASB (Olivier & Swart, 1988) for each school and each group (experimental and control)

ASB Descriptive Statistics		School		All
		School A	School B	
Test 1 Perception (BSS1)	N	33	25	58
	Mean	3.03	3.38	3.2
	Std	1.36	1.56	1.4
	Min	1	1	1
	Median	3	4	3
	Max	5	5	5
Test 2 Spatial (BSS2)	N	33	25	58
	Mean	2.03	2.42	2.2
	Std	1.03	1.02	1
	Min	1	1	1
	Median	2	2	2
	Max	4	4	4
Test 3 Reasoning (BSS3)	N	33	25	58
	Mean	2.18	1.92	2.1
	Std	1.11	0.88	1
	Min	1	1	1
	Median	2	2	2
	Max	5	5	5
Test 4 Numerical (BSS4)	N	33	25	58
	Mean	1.76	1.79	1.8
	Std	0.85	0.88	0.9
	Min	1	1	1
	Median	2	2	2
	Max	4	4	4
Test 5 Gestalt (BSS5)	N	33	25	58
	Mean	2.29	2.5	2.4
	Std	1	0.98	1
	Min	1	1	1
	Median	2	2	2
	Max	5	4	5
Test 6 Co-ordination (BSS6)	N	33	25	58
	Mean	2.65	2.71	2.7
	Std	0.95	1	1
	Min	1	1	1
	Median	3	3	3
	Max	5	5	5
Test 7 Memory (BSS7)	N	33	25	58
	Mean	2.26	2.58	2.4
	Std	1.33	1.59	1.4
	Min	1	1	1
	Median	2	2	2
	Max	5	5	5

Test 8 Verbal comprehension (BSS8)	N	33	25	57
	Mean	1.26	1.61	1.4
	Std	0.51	0.89	0.7
	Min	1	1	1
	Median	1	1	1
	Max	3	4	4
Pre-intervention average	N	33	25	58
	Mean	2.18	2.4	2.3
	Std	0.64	0.68	0.7
	Min	1.13	1.25	1.1
	Median	2.19	2.25	2.3
	Max	3.75	3.5	3.8

Pre-intervention data analysis indicates slight differences in the scores obtained on the ASB and SRDA, in certain of the sub-test scores between the two schools. This could be as a result of factors such as that more attention was paid to certain skills in School A than in School B, or *vice versa*. I considered such factors that could have contributed to the variance in school readiness scores, identifying possible reasons for the differences in the scores.

As shown in Table 4.3 (in red), seven of the eight sub-tests that form part of the ASB, tested as weak and very weak. Test 1 (Perception) was the only sub-test where both schools tested average (shown in green). According to Olivier and Swart (1988), the average achievement by the group for whom a battery was standardised, serves as a criterion or norm against which testees' raw scores are evaluated. Standard scores (norm scores) are obtained by converting the raw scores of a group to a standard scale – in this instance, a five-point scale which extends from 1 to 5 with the average of 3. For example, if a learner scores 4 points (indicated in yellow in Table 4.4) for the numerical test, the standard score will be 2 (indicated in blue), which indicates that the learner tested below average for the numerical test. Table 4.4 summarises the norms for sub-tests 1 to 8 for school beginners.

Table 4.4: Norms for ASB sub-tests 1 to 8 for school beginners (Olivier & Swart, 1988: 50)

Raw scores for tests								
	1	2	3	4	5	6	7	8
Standard score	Perception	Spatial	Reasoning	Numerical	Gestalt	Coordination	Memory	Verbal comprehension
1	0-5	0-1	0-2	0-2	0-35	0-8	0-1	0-7
2	6-7	2-3	3-6	3-4	36-62	9-17	2-7	8-11
3	8	4-6	7-8	5-7	63-86	18-24	8	12-14
4	9	7-9	9	8-9	87-98	25-28	9	15-17
5	10	10	10	10	99-100	29-30	10	18-20

Similarly, SRDA scores were converted to percentages, for the pre-intervention and post-intervention assessments for School A and School B. The SRDA scores for each subject were then calculated as average of the seven domains of the instrument. These seven domain averages were analysed further, which included the pre-intervention and post-intervention averages of all seven-domain averages. Descriptive statistics (mean, standard deviation, median, and maximum) were tabulated for the SRDA domain averages per school, and for both pre-intervention and post-intervention, and also for the difference between the post-scores and average pre-scores. These scores are shown in Table 4.5.

Table 4.5: Descriptive statistics for pre-intervention scores on the SRDA for each school and each group (experimental and control groups)

SRDA Descriptive Statistics		School		All
		School A	School B	
Physical and gross motor development (BS1)	N	33	22	58
	Mean	65.24	70.28	67.41
	Std	16.71	18.83	17.67
	Min	35	29	29
	Median	71	71	71
	Max	94	100.0	100.0
Fine motor coordination (BS2)	N	33	25	58
	Mean	74.42	71.62	73.21
	Std	17.93	16.55	17.26
	Min	35.75	35.75	35.75
	Median	82.5	74.25	76.38
	Max	95.00	100.00	100.00
Visual perception and integration (BS3)	N	33	25	58
	Mean	66.28	68.77	67.4
	Std	15.85	11.27	14
	Min	35.0	45.33	35
	Median	65.67	72	68.7
	Max	94	87	94
Mathematical / numerical ability (BS4)	N	33	25	58
	Mean	49.92	51.4	50.6
	Std	13.67	12.95	13.3
	Min	24.11	22.89	22.9
	Median	49.11	52.78	51.9
	Max	75	79.44	79.4
Body awareness and self-knowledge (BS5)	N	33	25	58
	Mean	55.5	55.05	55.3
	Std	19.57	22.77	20.8
	Min	12	12.63	12
	Median	58.38	58.38	58.4
	Max	86.5	92.25	92.3

Language, cognitive-thinking and auditory-perception (BS6)	N	33	25	58
	Mean	48.41	47.92	48.2
	Std	16.92	19.73	18
	Min	11.5	0	0
	Median	48.5	53.5	50
	Max	75	75	75
Socio-emotional development (BS7)	N	33	25	58
	Mean	42.95	46.13	44.3
	Std	20.8	22.45	21.4
	Min	4.71	10.43	4.71
	Median	45.71	50.86	46.5
	Max	86	78.86	86
Pre-intervention average	N	33	25	58
	Mean	57.53	58.74	58.1
	Std	11.93	14.17	12.8
	Min	28.35	32.3	28.4
	Median	60.12	60.29	60.2
	Max	81.82	82.67	82.7

As captured in Table 4.5, three of the seven tests (shown in red) that form part of the SRDA, tested below the expected developmental level for school readiness. Physical and gross motor development, fine motor coordination, visual perception and integration, and body awareness and self-knowledge tested average in both schools (shown in green). According to Van den Berg (2014), scores below 50% are seen as below average. To further illustrate these results, Figure 4.1 (example taken from Van der Berg's [2014] training manual), provides an example of the developmental domains and perceptual-motor areas of a Grade R learner which fell in the red area of the graph and are thus seen as below the expected norm. In the example provided in Figure 4.1, visual-perception integration, mathematical or numerical ability, body-awareness and self-knowledge, language cognitive-thinking, and auditory perception tested below average. In broadly interpreting the SRDA test, all scores below 50% are seen as below average, indicated by the red area in Figure 4.1.

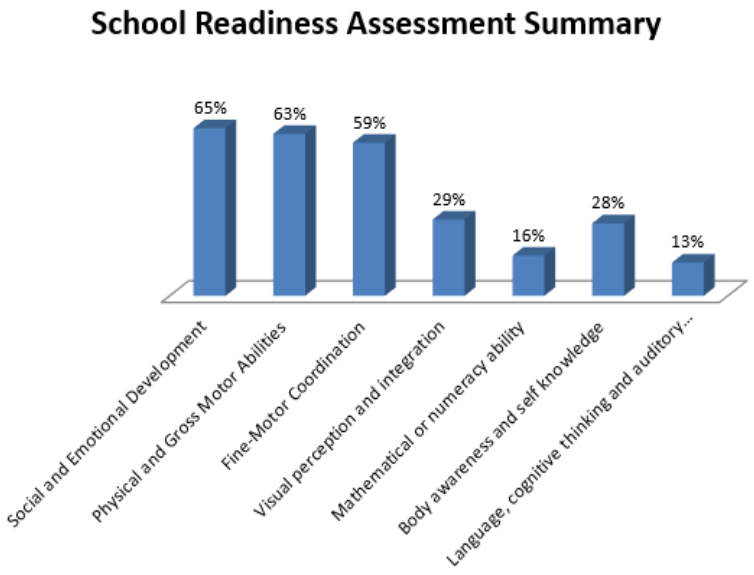

Figure 4.1: SRDA scoring example (She or he)

In order to measure whether or not the learners in the two schools differed with regard to their school readiness levels pre-intervention, the average scores of the two schools were compared using a one-way analysis of variance (ANOVA) with the factor *school*. The factor *school* was not statistically significant (P=0.2361), thus p>0.05 suggests that, at baseline, there was no systematic differences between the two schools regarding the school readiness levels.

Furthermore, statistical hypotheses were formulated to assess whether the pre-intervention scores generated from the ASB (Olivier & Swart, 1988) and the SRDA, of the two schools, were significantly different from each other (between-school comparisons). These analyses were done to determine whether or not there was an initial difference between the two schools. The null hypotheses for between-schools' comparisons pre-intervention, were as follows:

- H0: There is no difference between schools in terms of the school readiness levels of Grade R learners from resource-constrained settings pre-intervention.
- H0: μSchool A = μSchool B (pre-intervention).

The alternative hypotheses were:

- HA: There is a difference between schools in terms of the school readiness levels of Grade R learners from resource-constrained settings pre-intervention.
- HA: μSchool A ≠ μ School B (pre-intervention).

Results obtained during the pre- and post- intervention tests for both the ASB and SRDA data showed domains and areas that were below average, as shown in Tables 4.3, 4.5, 4.6 and 4.7. These results were utilised when designing the perceptual-motor intervention programme. Domains below the expected level of development were accordingly identified and age-appropriate activities were designed that would centre on the perceptual-motor development required for language and mathematics when a learner enters the phase of formal schooling. All activities were designed to be concrete and involved learners' senses.

The statistical details in Table 4.5 are supported by Figures 4.2, 4.3, 4.4 and 4.5 which indicate the raw scores of the areas that tested below average on the SRDA pre-intervention. These scores were utilised during the design of the perceptual-motor intervention programme, as the purpose was to promote development of these perceptual areas which could in turn potentially support the school readiness levels obtained post-intervention. Figures 4.2 and 4.3 provide summaries of the raw scores of School A and School B for the mathematical and numerical abilities of the participating Grade R learners' pre-intervention. In the same manner, Figures 4.4 and 4.5 provide summaries of the raw scores of School A and School B for language, cognitive-thinking and auditory perception skills.

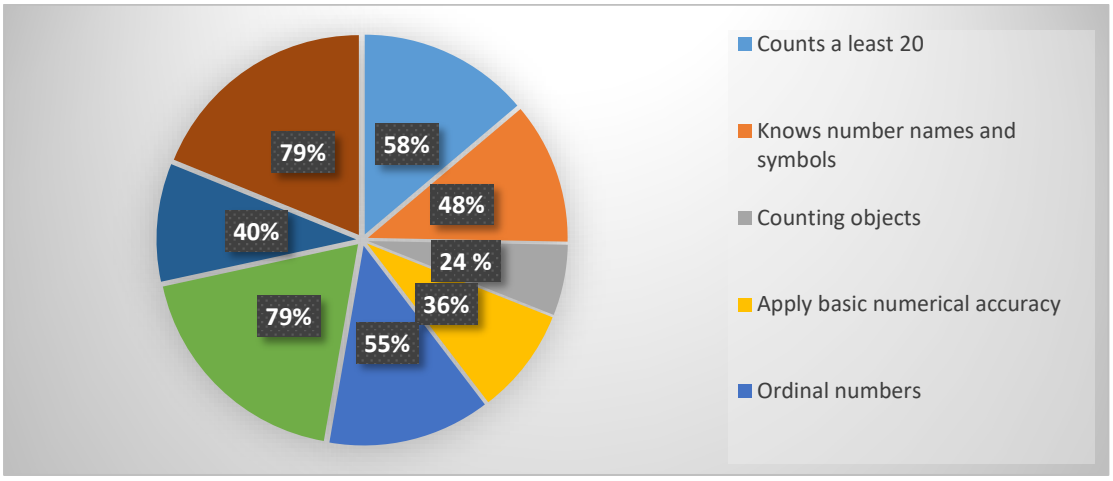

Figure 4.2: Raw scores of School A (n= 33) pre-intervention on all the categories of Test 4 of the SRDA (Mathematical and numerical ability)

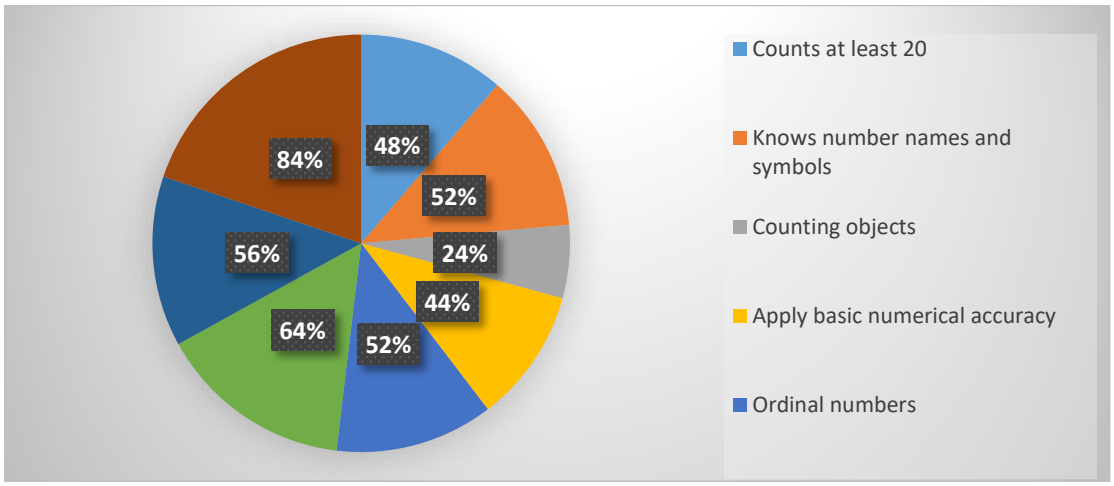

Figure 4.3: Raw scores of School B (n= 25) pre-intervention on all the categories of Test 4 of the SRDA (mathematical and numerical ability)

Figures 4.4 and 4.5 provide summaries of the raw scores of School A and School B for the language, cognitive-thinking and auditory perception skills.

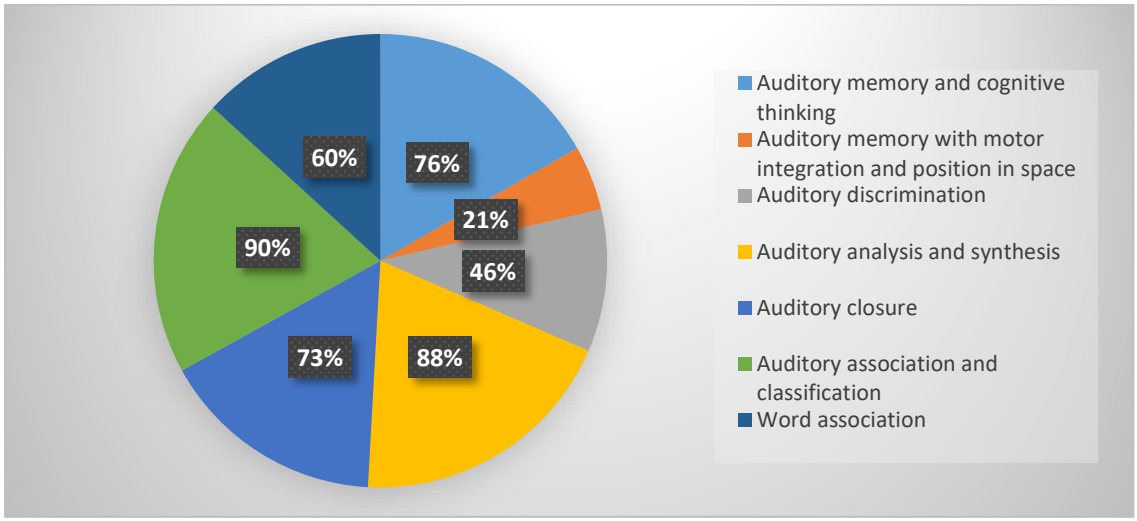

Figure 4.4: Raw scores of School A (n= 33) pre-intervention for all the categories of Test 6 of the SRDA (language, cognitive-thinking and auditory perception)

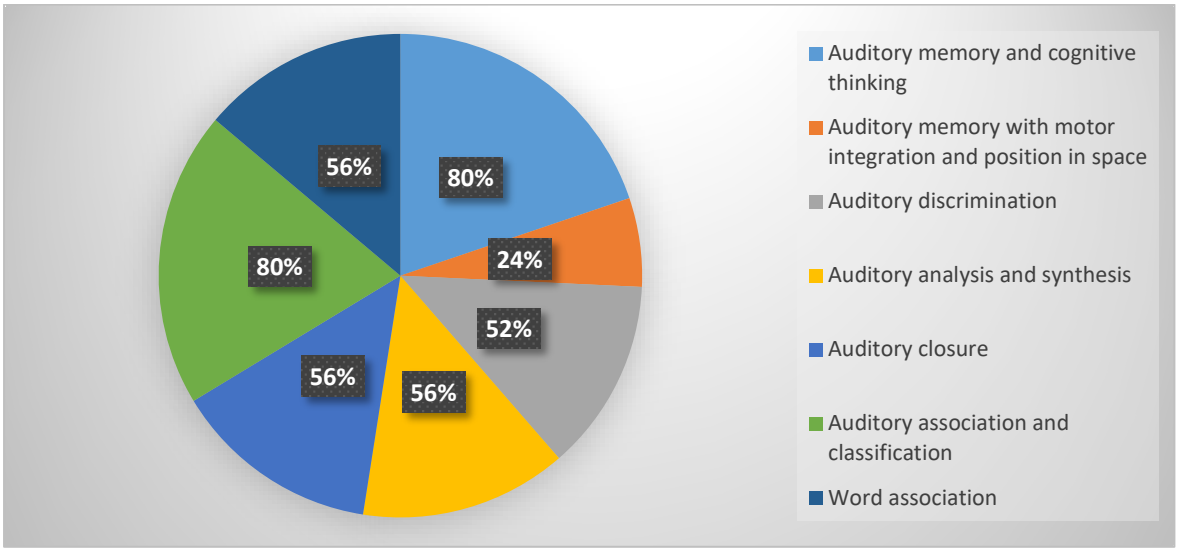

Figure 4.5: Raw scores of School B (n= 25) pre-intervention for all the categories of Test 6 of the SRDA (language, cognitive-thinking and auditory perception)

4.4 POST-INTERVENTION QUANTITATIVE RESULTS

Descriptive statistics (mean, SD, minimum, median and maximum) were tabulated for both the ASB and SRDA scores obtained from School A and School B, post-intervention. Furthermore, descriptive statistics were tabulated for the average ASB post-intervention scores (over the eight sub-tests), as captured in Table 4.6, for School A and School B. Descriptive statistics were also tabulated for the SRDA domain averages, for School A and School B, for the post-test.

Table 4.6: Descriptive statistics for post-intervention scores on the ASB (Olivier & Swart, 1988) for each school and each group (experimental and control)

ASB Descriptive Statistics		School		All
		School A	School B	
Test 1 Perception (BSS1)	N	31	12	43
	Mean	3.94	3.33	3.8
	Std	1.15	1.44	1.3
	Min	1	1	1
	Median	4	3.5	4
	Max	5	5	5
Test 2 Spatial (BSS2)	N	31	12	43
	Mean	2.77	2.42	2.7
	Std	0.88	0.9	0.9
	Min	1	1	1
	Median	3	2.5	3
	Max	4	4	4
Test 3 Reasoning (BSS3)	N	31	12	43
	Mean	2.58	2.17	2.5
	Std	1.12	1.47	1.2
	Min	1	1	1
	Median	3	1.5	2
	Max	5	5	5
Test 4 Numerical (BSS4)	N	31	12	43
	Mean	2.32	1.58	2.1
	Std	0.87	1.16	1
	Min	1	1	1
	Median	2	1	2
	Max	4	4	4
Test 5 Gestalt (BSS5)	N	31	12	43
	Mean	2.58	2	2.4
	Std	0.81	0.85	0.9
	Min	1	1	1
	Median	3	2	3
	Max	4	3	4
Test 6 Co-ordination (BSS6)	N	31	12	43
	Mean	2.77	1.75	2.5
	Std	0.8	0.62	0.9
	Min	1	1	1
	Median	3	2	2
	Max	4	3	4
Test 7 Memory (BSS7)	N	31	12	43

	Mean	2.81	2.08	2.6
	Std	1.62	1.44	1.6
	Min	1	1	1
	Median	2	2	2
	Max	5	5	5
Test 8 Verbal comprehension (BSS8)	N	31	12	43
	Mean	1.81	1.42	1.7
	Std	0.79	0.9	0.8
	Min	1	1	1
	Median	2	1	2
	Max	4	4	4
Post-intervention average	N	31	12	43
	Mean	2.7	2.09	2.5
	Std	0.63	0.7	0.7
	Min	1.5	1.25	1.3
	Median	2.75	1.94	2.5
	Max	3.75	3.5	3.8

Descriptive statistics were furthermore tabulated for the average SRDA scores (over seven domains of the test) for both schools, for both pre-intervention and post-intervention, and for the differences between the average pre-scores and average post-scores. Table 4.7 summarises the descriptive statistics for the post-intervention scores on the SRDA for both School A and School B.

Table 4.7: Descriptive statistics for post-intervention scores for the results on the SDRA (Van der Berg, 2014) for each school and each group (experimental and control)

SRDA Descriptive Statistics		School		All
		School A	School B	
Physical and gross motor development (BS1)	N	29	23	52
	Mean	78.31	72.04	75.5
	Std	15.32	19.43	17.4
	Min	41	29	29
	Median	76	71	76
	Max	100	94	100
Fine motor coordination (BS2)	N	29	23	52
	Mean	84.69	85.38	85
	Std	9.54	9.66	9.5
	Min	58	61	58
	Median	86.75	88	87.8
	Max	100	97.25	100
Visual perception and integration (BS3)	N	29	23	52
	Mean	72.49	77.7	74.8
	Std	11.7	10.96	11.6
	Min	41.67	53	41.7
	Median	71.33	81.33	75.7
	Max	91	92.33	92.3
Mathematical/numerical ability (BS4)	N	29	23	52
	Mean	65.61	58.94	62.7
	Std	15.48	13.71	15
	Min	37.67	34.44	34.4
	Median	70.56	59.78	64.6
	Max	93.11	81.56	93.1
Body awareness and self-knowledge (BS5)	N	29	23	52
	Mean	67.19	54.72	61.7
	Std	20.65	27.65	24.6
	Min	31.25	10.38	10.4
	Median	71.88	61.5	67.6
	Max	97.88	92.75	97.9

Language, cognitive-thinking and auditory perception (BS6)	N	29	23	52
	Mean	56.53	50.48	53.9
	Std	17.53	20.7	19.1
	Min	23.5	10	10
	Median	56.5	51.5	55
	Max	93.5	86.5	93.5
Socio-emotional development (BS7)	N	29	23	52
	Mean	55.09	45.96	51.1
	Std	21.56	26.65	24.1
	Min	12.29	3.57	3.57
	Median	61.14	48.71	56.9
	Max	92.14	85.43	92.1
Post-intervention average	N	29	23	52
	Mean	68.56	63.6	66.4
	Std	10.82	13.28	12.1
	Min	48.66	37.33	37.3
	Median	69.9	62.6	67
	Max	90.08	86.06	90.1

Domains indicated in green in Tables 4.6 and 4.7 indicate that Grade R learners were functioning on or above the expected level of development at the time of the post-intervention assessment. The ASB scores showed an increase in performance but remained mostly below the average standard score of 3. However, learners demonstrated significant progress on the SRDA test battery following the intervention. For all domains, School A learners (experimental group) attained the expected level of development after the intervention had been implemented. School B (control group) also showed an increase in the levels of school readiness in all the domains, except for the socio-emotional developmental area. The increase in scores for both schools may have occurred as a result of natural maturation and development over the 8-week period during which the intervention was implemented with the experimental group. The experimental group scores were however higher on both test batteries (ASB and SRDA) than the control group post-intervention, indicating that the difference in scores cannot merely be ascribed to natural maturation.

4.5 PRE-POST INTERVENTION QUANTITATIVE RESULTS

Tables 4.8, 4.9 and 4.10 summarise the differences between the experimental and control groups pre-intervention and post-intervention, on both instruments.

Table 4.8: Differences for average scores obtained by the experimental and control groups pre-intervention and post-intervention for both instruments

Test battery	Pre-Intervention/ Post-Intervention	School (Mean[13])		Mean difference: Intervention - Control		
		Experimental	Control	Point estimate[14]	95% Confidence Interval	P-Value[15]
ASB	**Pre**	2.18	2.40	-0.21	-0.57 to 0.14	0.2361
	Post	2.71	2.07	0.63	0.33 to 0.94	*0.0002
SRDA	**Pre**	57.53	58.74	-1.21	-8.08 to 5.67	0.7263
	Post	68.50	63.68	4.82	-0.46 to 10.10	0.0726

As indicated in Table 4.8, the p-value of the ASB post-test showed a value of p>0.0002 which indicates a statistically significant result. Thus, results obtained post-intervention from the ASB test, indicate that the perceptual-motor intervention had a statistically significant effect on the school readiness levels of the participating Grade R learners, confirming that the perceptual-motor intervention programme was successful.

[13] Pre-intervention mean: Simple average of data per school; Post intervention mean: Least square estimate of mean value per school form ANCOVA (analysis of covariance) with school as main effect, and pre-intervention data as covariate.

[14] Pre-intervention: Point estimate, 95% confidence interval of the mean difference "Experimental-control" from one-way ANOVA with School as main effect; Post-intervention: Point estimate and 95% confidence interval of the mean difference "experimental-control" from ANCOVA with school as main effect, and pre-intervention data as covariate.

[15] Pre-intervention: P-value for t-test of the null-hypothesis that the mean difference "experimental-control" is 0, from ANOVA as described above;
Post-intervention: P-value for t-test of the null hypothesis that the mean difference "experimental-control" is 0, from ANCOVA as described above.

Table 4.9: Differences for average scores obtained by the experimental and control groups pre-intervention and post-intervention on the ASB

Test battery	Pre-Intervention/ Post-Intervention	School (Mean[16])		Mean difference: Intervention - Control		
ASB (Olivier and Swart, 1988)		Experimental	Control	Point estimate[17]	95% Confidence Interval	P-Value[18]
ASB Test 1	Pre	3.03	3.38	-0.35	-1.11 to 0.42	0.37
	Post	3.91	3.39	0.52	-0.25 to 1.29	0.18
ASB Test 2	Pre	2.03	2.42	-0.39	-0.93 to 0.16	0.16
	Post	2.79	2.38	0.40	-0.18 to 0.99	0.17
ASB Test 3	Pre	2.18	1.92	0.26	-0.28 to 0.80	0.35
	Post	2.57	2.19	0.38	-0.42 to 1.17	0.34
ASB Test 4	Pre	1.76	1.79	-0.03	-0.49 to 0.44	0.91
	Post	2.30	1.62	0.68	0.13 to 1.23	*0.02
ASB Test 5	Pre	2.29	2.5	0.21	-0.74 to 0.32	0.44
	Post	2.57	2.03	0.53	0.05 to 1.01	*0.03
ASB Test 6	Pre	2.65	2.71	-0.06	-0.58 to 0.46	0.81
	Post	2.79	1.71	1.07	0.58 to1.55	*0.0001
ASB Test 7	Pre	2.26	2.58	-0.32	-1.09 to 0.45	0.41
	Post	2.82	2.02	0.80	-0.16 to 1.76	0.10
ASB Test 8	Pre	1.26	1.61	-0.35	-0.72 to 0.03	*0.07
	Post	2.79	1.71	1.07	0.54 to 1.62	*0.0002

The differences between the average scores of the experimental and control groups pre-intervention and post-intervention, indicate that the following ASB sub-tests had a statistically significant difference:

- Sub-test 4 (Numerical) pre-test: p>0.02
- Sub-test 5 (Reasoning) pre-test: p>0.03
- Sub-test 6 (Co-ordination) pre-test: p>0.0001
- Sub-test 8 (Verbal comprehension) pre-test: p>0.07

[16] Pre-intervention mean: The simple average of data per school; Post intervention mean: The least square estimate of mean value per school from ANCOVA with "school" as main effect, and pre-intervention data as covariate.

[17] Pre-intervention: Point estimate and 95% confidence interval of the mean difference "experimental-control" from one-way ANOVA with "school" as main effect; Post-intervention: Point estimate and 95% confidence interval of the mean difference "experimental-control" from ANCOVA with "school" as main effect, and pre-intervention data as covariate.

[18] Pre-intervention: P-value for t-test of the null-hypothesis that the mean difference "experimental-control" is 0, from ANOVA as described above; Post-intervention: P-value for t-test of the null hypothesis that the mean difference "experimental-control" is 0, from ANCOVA as described above.

- Sub-test 8 (Verbal comprehension) post-test: p>0.0002

Therefore, as indicated above, the post-intervention ASB test scores indicate that the perceptual-motor intervention had a positive effect on not only the general school readiness levels of the learners, but also on individual perceptual-motor domains. Sub-tests 6 and 8 further indicate statistically significant differences in the scores obtained by the experimental and control groups.

As indicated earlier, an ANCOVA was used to test for statistically significant differences in post-intervention scores between the experimental and control groups. The ANCOVA model included the factor *school* (intervention *versus* control), and the pre-intervention ASB scores as covariate. These analyses were done with the intention of determining whether or not the perceptual-motor intervention programme had an effect on the school readiness levels of the experimental group.

With regard to the ASB, the mean difference between the schools for the post-intervention scores was 0.63 (95%CI 0.33 to 0.94; P=0.0002), as captured in Table 4.8. Thus, a statistically significantly higher average was obtained post-score for the experimental group than for the control group. This result implies that the null hypothesis can be rejected. In Table 4.10 the differences between the experimental and control groups pre-intervention and post-intervention on the SRDA are summarised.

Table 4.10: Differences for average scores obtained by the experimental and control groups pre-intervention and post-intervention on the SRDA

Test battery	Pre-intervention/ Post-intervention	School (Mean[19])		Mean difference: Intervention - Control		
SRDA (She or he)		**Experimental**	**Control**	**Point estimate[20]**	**95% Confidence Interval**	**P-Value[21]**
SRDA Test 1	**Pre**	65.24	70.28	-5.04	-14.41 to 4.33	0.29
	Post	78.82	71.34	7.42	-1.16 to 16.0	0.09
SRDA Test 2	**Pre**	74.42	71.62	2.8	-6.42 to 12.01	0.54
	Post	84.39	85.75	-1.36	-6.61 to 3.89	0.61
SRDA Test 3	**Pre**	66.28	68.77	-2.49	-9.97 to 4.99	0.51
	Post	72.57	77.60	-5.02	-11.37 to 1.33	0.12
SRDA Test 4	**Pre**	49.92	51.40	-1.48	-8.58 to 5.61	0.68
	Post	65.51	59.05	6.47	-0.84 to 13.78	0.08
SRDA Test 5	**Pre**	55.50	55.05	0.45	-10.7 to 11.6	0.94
	Post	67.02	54.91	12.10	1.31 to 22.9	0.03
SRDA Test 6	**Pre**	48.41	47.92	0.49	-9.16 to 10.14	0.91
	Post	56.03	51.07	4.98	-4.13 to 14.11	0.28
SRDA Test 7	**Pre**	42.95	46.13	-0.18	-14.60 to 8.25	0.58
	Post	55.59	45.33	10.26	-0.60 to 21.12	0.06

In terms of the overall average SRDA scores (average of seven domain averages), the post-intervention scores indicate a mean difference between the two schools of 4.9 (95% CI -0.5 to 10.1; P= 0.0726). Therefore, the intervention had a higher average post-score for the experimental group than for the control school. Even though the difference is not statistically significant, as indicated in Table 4.10, the results imply that the null hypothesis can be rejected and the alternative hypothesis accepted.

I formulated two hypotheses to assess whether or not the post-intervention scores on the ASB (Olivier & Swart, 1981) and SRDA (Van der Berg, 2014), for the two schools,

[19] Pre-intervention mean: Simple average of data per school; Post intervention mean: Least square estimate of mean value per school from ANCOVA, with "school" as main effect, and pre-intervention data as covariate.
[20] Pre-intervention: Point estimate and 95% confidence interval of the mean difference "experimental-control" from one-way ANOVA with "school" as main effect; Post-intervention: Point estimate and 95% confidence interval of the mean difference "experimental-control" from ANCOVA with "school" as main effect, and pre-intervention data as covariate.
[21] Pre-intervention: P-value for t-test of the null-hypothesis that the mean difference "experimental-control" is 0, from ANOVA as described above; Post-intervention: P-value for t-test of the null hypothesis that the mean difference "Experimental-control" is 0, from ANCOVA as described above.

were significantly different from each other (between-school comparisons). The null hypotheses for the between-school comparisons post-intervention, were as follows:

- HO: There is no difference between schools in terms of the school readiness levels of Grade R learners from resource-constrained settings post-intervention
- HO: μSchool A (post-intervention) = μSchool B (post-intervention).

The alternative hypotheses were:

- HA: There is a difference between schools in terms of the school readiness levels of Grade R learners from resource-constrained settings post-intervention
- HA: μSchool A (post-intervention) ≠ μ School B (post-intervention).

4.6 QUALITATIVE RESULTS OF THE STUDY

In this study, qual data were intended to support the QUAN data obtained *via* two school readiness instruments. The purpose of the qual part of the study was to explore Grade R teachers' understanding of school readiness, perceptual-motor development, and resources that could potentially support the school readiness of learners in resource-constrained settings

In this section, I present the qualitative results I obtained, in terms of the themes and sub-themes I identified during thematic data analysis of the semi-structured interviews, field notes and my research diary. Throughout, I illuminate my discussion by providing examples of participant-responses and extracts from the data sources. As an introduction, Figure 4.6 provides an overview of the main themes and related sub-themes I identified.

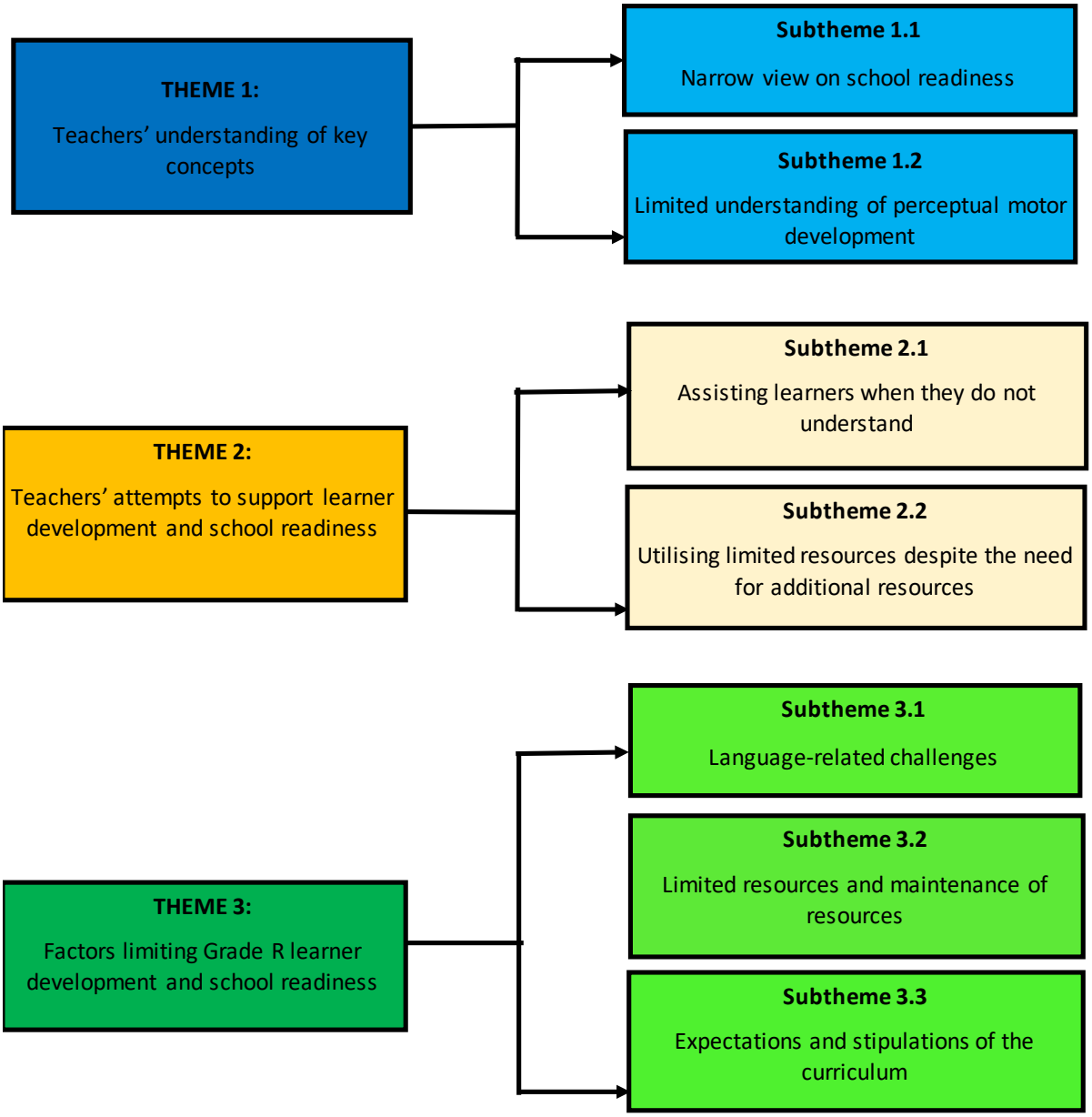

Figure 4.6: Overview of qualitative results

4.6.1 Theme 1: Teachers' understanding of key concepts

This theme captures the Grade R teachers' understanding of the concept school readiness. Two sub-themes apply, related to teachers' narrow view of school readiness and determining whether or not a learner is ready for school in class; and to a limited understanding of what perceptual-motor development entails. In Table 4.11, I summarise the inclusion and exclusion criteria for Theme 1.

Table 4.11: Inclusion and exclusion criteria for Theme 1

Theme 1: Teachers' understanding of key concepts		
Sub-themes	**Inclusion criteria**	**Exclusion criteria**
1.1 Narrow view of school readiness	All data related to participants' view of school readiness in terms of selected aspects, yet not including all related aspects as well as the way in which school readiness can be determined in class	All data that refer to teachers' understanding of what perceptual-motor development entails
1.2 Limited understanding of perceptual-motor development	All data related to participants' understanding of what perceptual-motor development entails and also to the link between school readiness and perceptual-motor development	All data that refer to teachers' views of school readiness only, or how to determine whether or not a learner is ready for school in class

4.6.1.1 Sub-theme 1.1: Narrow[22] view of school readiness

Teacher-participants displayed a narrow view of the concept school readiness, focusing on selected aspects of school readiness only. Participants mainly indicated that a child is ready for school if she or he can count, have the ability to remember and can listen to and convey a message. When asked to explain their understanding of the concept, the participants responded as follows:

- "*Usually what I see is when he can do what I expect of him. For example, he now knows when we do double sounds and single sounds, and I can also ask them when I use the posters. I can also see when they use counters…count this and*

[22] I include "narrow" in the heading for this sub-theme due to the teacher-participants not viewing school readiness as a holistic concept and only focusing on the cognitive development of Grade R learners.

his and write your name. They can take a message home and give me message or feedback from home. This is how I see this[23]*"* (T1[24], I1, page 1).

- *"Well…if they are able to follow the instructions they were given, understand it and interpret what they were told to do then I think they are ready for school"* (T2, I1, page 7).
- "*I think they might have a problem if they don't understand or if you tell them to do something…he understands it but he does it in the complete opposite way or he does his own thing, then there might be a problem"* (T2, I1, page 7).

During several classroom observations, I noted that the Grade R learners were mostly seated on the carpet while repetition drills and rote-learning took place. During one instance, learners were asked to recite the months of the year, first in a group and then individually. I reflected on this tendency in the following way: *"The teacher was busy revising months of the year, before, after, between (integrating numeracy and sequential memory; reciting months of the year in sequence)"* (RJ, 15 August 2016, lines 8-11). From these observations, it appeared as if teachers did not encourage independent learning and did not view school readiness as something broader than possessing a few selected skills, which were often taught through rote-learning. When I asked the teachers how they would determine whether or not a learner is school ready, the participants yet again indicated a narrow view. They focused on learners being able to follow and act on instructions, saying "*mostly what I see is when the child is able to do what I expect of him*[25]*" (*T1, I1, page 1).

Teachers apparently depended on what could be observed of a learner during classroom activities, relying on their own views of school readiness rather than on the child's abilities. Ample emphasis was placed on counting, sounds, double sounds, learners writing their names, and whether or not messages could be delivered to parents or caregivers and feedback could be provided, as indicated in the contributions provided earlier in this section.

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[23] Translated from Afrikaans*: "Gewoonlik wat ek kan sien is wanneer die kan DoEn wat ek van hom verwag.Byvoorbeeld, hy ken nou al wanneer ek dubbelklanke en enkelklanke DoEn, en ek kan dit vir hulle vra ook met die plakate en dan kan ek ook sien met die tellers…tel vir my dit en dit en skryf vir my jou naam…hulle kan 'n boodskap oordra huis toe en vir my 'n boodskap of terugvoering gee. Dit is hoe ek kan sien".*

[24] Henceforth the following abbreviations apply: T=teacher, I=interview, RJ=reflective journal, FN=field notes

[25] Translated from Afrikaans: "Gewoonlik wat ek kan sien is wanneer die kan DoEn wat ek van hom verwag".

In support of this focus, I observed that the learners were required to count out loud almost on a daily basis. They would first count in a group and then individually. Very little concrete experience of counting objects or counters occurred during the days I observed lessons in class. I reflected on my observation in the following way: "*Children are generally well disciplined and pay attention. There is a lot of focus on children individually. After the group counted in pairs, individual children were also asked to count in two's"* (RJ, 15 September 2016, lines 209-212).

In summary, for the teacher-participants, the main focus apparently fell on the competencies and skills of the learners, and them being able to write their own names, including counting and writing down numbers and the letters of the alphabet. The focus thus apparently fell on cognitive abilities related to language and mathematics which were stimulated by means of rote-counting activities and the repetition of letters and sounds. Very little or no attention was apparently given to perceptual-motor development, social development, emotional development, or moral development. I reflected on my observations and what I learned during the interviews in the following way: *"Generally I observed that teachers showed limited understanding of the different developmental domains. After some guidance from me, they did realise what was meant by developmental domains. They displayed a strong focus on cognitive development. Perceptual development was a 'new' term. I also did not observe many activities in terms of emotional, moral and social development"* (RJ, 20 September 2016, lines 143-152). As such, the qualitative results I obtained, point to the possibility of both groups of teachers not having a clear understanding of the different developmental domains that form part of the holistic view of school readiness.

4.6.1.2 Subtheme 1.2: Limited understanding of perceptual-motor development

During the semi-structured interviews, the teachers seemingly did not clearly understand what perceptual-motor development entails. Even though they displayed some insight in terms of important perceptual-motor skills, they did not link perceptual-motor development to school readiness. The following contributions demonstrate the teacher-participants' initial understanding of the concept:

- *"Hmmmm…meaning that when you have to do something?"* (T2, I1, page 7).
- *"To be honest, you will have to tell me what it is"*[26] (T1, I1, page 2).

Upon realising that the two participants did not have a clear understanding of what the concept perceptual-motor development implies, I briefly explained the concept to them and then I asked their views on the relationship between perceptual-motor development and school readiness. They responded as follows:

- "As *we have just said, it has to do with a child's senses and that the child will have to make use of these senses throughout his or her school career. He has to and will use it*[27]*"* (T1, I1, page 4)
- "*If a child cannot like physically perform a task, he might have a problem because then you have to sit with the child tell them everything that…explain it and then they can do it, if they can't then you must…how can I say it…you basically must have a one on one session with them"* (T2, I1, page 8).

As such, even after explaining perceptual-motor development to the teachers, they still were unable to link this concept with school readiness. I reflected on the above excerpts and my observations in the following way: *"Generally I realised that the teachers had a very limited understanding of what perceptual-motor skills are. Even after explaining this briefly during the interviews, their understanding was still limited. However, I saw how Teacher 2 started to understand during the training and implementation of the perceptual-motor intervention programme. She started making the link between perceptual-motor development and school readiness"* (RJ, 14 September 2016, lines 143-148).

4.6.2 Theme 2: Teachers' attempts to support learner-development and school readiness

Theme 2 captures the teacher-participants' attempts to support learners' development and school readiness. The sub-themes relate to how teachers assist learners when they do not understand the work and how they utilise (limited) resources to enrich

[26] Translated from Afrikaans: *"Om eerlik te wees ek sal wil dat u my daar moet touwys maak".*
[27] Translated from Afrikaans: *"Soos ons nou genoem het, dit het meer te doen met die kind se sintuie, en dit voel vir my soos die kind se sintuie moet gebruik word deur sy hele loopbaan. Hy moet en sal dit gebruik".*

learning experiences. The inclusion and exclusion criteria of Theme 2 are summarised in Table 4.12.

Table 4.12: Inclusion and exclusion criteria for Theme 2

Theme 2: Teachers' attempts to support learner-development and school readiness		
Sub-themes	**Inclusion criteria**	**Exclusion criteria**
2.1 Assisting learners when they do not understand	All data related to ways in which learners are assisted by teachers when they do not understand some of the work	All data that refer to teachers assisting learners by utilising limited resources to enrich learning experiences
2.2 Utilising limited resources despite the need for additional resources	All data related to teachers utilising limited resources to enrich learning experiences in and outside the classroom, as well as their need for additional resources	All data that refer to how learners are assisted when they do not understand the work, or to teachers' need for guidance in this regard

4.6.2.1 Subtheme 2.1: Assisting learners when they do not understand

Although the teachers generally had limited resources available and did not have in-depth knowledge of perceptual-motor development or what the concept schools readiness entails, they still assisted leaners when learners did not understand something. They specifically referred to assisting learners individually, and to the learning content being available for learners to see. Teacher-participants explained how they did this in the following way:

- *"…I explain it and then they can do it, if they can't then you must…how can I say it…you basically must have a one on one session with them"* (T2, I1, page 8)
- *"… you must always be around the child"* (T2, I1, page 8)
- "*So they see how it is written and they know everything. When I give them a day, they will know exactly where the day is because they see it around them every*

day. I also tell them when they count they must use their fingers to count" (T2, I1, page 9).

From my observations, I realised that the teacher of School B appeared to follow a hands-on-approach, utilising available resources to enrich the learning experience, and assisting learners where/when needed. She mentioned the following examples of her efforts to support learners and their learning:

- "*Yes, and if it's a lot of children who don't understand I normally let them sit in a group and I will for example do the activities and ask children to yell me what I just did, and to explain the next activity… and so on. Until I have asked all of them. When I see they know, I move on"* (T2, I, page 8)
- "*On the board we normally have the days of the week posters, so we do the posters, we do not only speak about it…I let them go to the board and then they have to point at the stuff that they are saying"* (T2, I, page 9)
- *"…we use a lot of clay as well…"* (T2, I, page 9)
- *"…when we do a letter we make sure that every week we go out and then they have to go draw the letter in the sand"* (T2, I, page 11).

This teacher, therefore, seemed to rely on scaffolding to ensure that learners master new content, utilising the resources available to her to assist learners who do not understand content and concepts. She would continue implementing this strategy until she was certain that learners understand and have gained new knowledge. In this way, the teacher of School B apparently monitored learners when teaching new work, and intervened immediately if she observed that a learner was uncertain about something – this timeously reinforced concepts and content knowledge.

4.6.2.2 Sub-theme 2.2: Utilising limited resources despite the need for additional resources

Teachers reportedly utilised the limited resources available to them to enrich learning experiences in class. One of the teachers in this regard explained that *"I use those educational toy stuff. Building blocks, threading toys, maths games, clay, peg boards*

and beads[28]*"* (T1, I1, page 5). To elaborate, this teacher-participant took the above-mentioned resources from the cupboard and showed them to me. Even though she indicated to me that she used the resources to enrich the learning experiences of the learners, I wonder about the authenticity of this based on my observations; throughout the study, I captured my observations in my field notes by penning "…*her body language and tone of voice indicated something different. It seemed that the available resources she had was not really utilised"* (FN, 16 August 2016, lines 55-57). In support of my observation of the teacher when explaining this to me, and doubting the authenticity of her report, Photograph 4.1 aligns with my observation that toys are kept in cupboards and not packed out for learners to use.

Photograph 4.1: Educational toys packed in cupboards (School A, 6 September 2016)

A more concrete example of how the teachers used limited resources to enrich the learning experiences of the learners is captured verbatim in the following excerpt taken from the interview with the Grade R teacher of School B:

> Researcher: *"Do you have beanbags? ":*
>
> Teacher 1: "*No, we don't have beanbags, but we do have skipping ropes. What I usually do is I ask the children to bring fruit from home… you see mam, then I use these also to teach them about colours and shapes and this then forms part of their senses. What it tastes like; is it sour or is it sweet? Sense do form part of this? I will also ask them to bring rice and sugar from home and then we discuss texture, whether it is rough or smooth?*
>
> *Sometimes I will buy paper plates and then they have to stick different textures on the plate (I will divide the plate in four sections) and then they can*

[28] Transslated from Afrikaans: *"Ek gebruik daardie opvoedkundige speelgoete….Kan ek maar gaan haal?" (Staan op en loop kas toe). Boublokkies, ryg, wiskundige speletjie, klei, pennetjie en borde, nog blokkies, nog deeg (klei), krale".*

differentiate between different textures. Almost like a texture plate. This is what I usually do. If I want to do some auditory activities, I need to go and sign out the CD player. We then do music and movement activities…different directions (T1, I1, page 6)[29]*".*

From this example, it is clear that teacher-participants made use of limited resources to enhance the learning and teaching experiences when I conducted my fieldwork. However, one teacher requested learners to bring items from home to be able to present her lessons in a more creative and fun way. Photograph 4.2 indicates some resources the teachers requested the learners to bring from home, which were used to enrich the teaching and learning experience.

Photograph 4.2: Resources requested from home to enrich the teaching and learning experiences (School B, 7 September 2016)

I also asked the participating teachers whether or not the schools have books available for their use; for example, storybooks or non-fiction books. In response, the teacher from School B indicated that they do have books available, but that these were tattered and old; however, she had obtained permission from the school to order new books and would be receiving these soon, as well as some CD's and additional toys. The teacher-participant explained it as follows: *"…the department is going to send me a*

[29] Translated from Afrikaans: *"Nee daar is nie. Daar is nie boontjiesakkies nie en dan is dit nou die toue (springtoue). Wat ek ook gewoonlik DoEn, especially wat nou daarby inkom… ek gaan miskien vir die kinders vra hulle moet vrugte van die huis afbring…sien mevrou en dan DoEn ek sommer nou kleure daaruit ook en dan DoEn ek vorms daaruit en dan DoEn ek ook deel van sintuie…hoe proe dit, is dit suur is dit soet en dan vra ek sulke goed van die huis af. Dis dan deel van die tema bespreking en so. Sintuie kom mos ook daarby? En dan* sal *ek ook vir hulle vra om rys te bring en suiker van die huis af, mieliemeel…en dan praat ons oor grof en hard…soos in teksture. Wat is daar wat ek die ander dag ook met kinders geDoEn het? (dink)…. Miskien sal ek bordjies koop en dan moet hulle vir my soos in plak…die plastiek is sag…ek gaan miskien die bord in 4 deel en dan moet hulle onderskei tussen hard en sag en grof en dit so plak in die bord. Amper soos 'n tassintuigbordjie. Dis wat ek gewoonlik DoEn en om meer vir hulle se gehoor dan moet ek die CD speller gaan uitteken en dan DoEn ek met hulle musiek vir die hoor en vir beweging…die verskillende rigtings".*

whole kit with everything inside. So they will send us the big books and CD's and stuff and toys. I am now waiting for it[30]*"* (T1, I1, page 5).

Similarly, the teacher-participant from School A stated the following in this regard:

> Researcher: "*What did you order?"*
>
> Teacher: "*Aprons for the children to use when they are painting and a ball and mathematics stuff, like posters and number cards with the name on and the dots so that they can count and hula-hoops because the old ones we have are very old and I also requested more instruments because there are some instruments we don't have and it was the theme posters, there are some posters that we did have but the ones that the ladies have, have more details on the posters"* (T2, I1, page 10).

Despite teachers indicating the need for new resources and that available resources were old and not in a good condition, my observations point to a contradiction. Photographs 4.3 to 4.6 provide evidence of some of the resources I observed, with some of these being new and rarely used. Some other resources, however, seemed to be not functional anymore and were stored in boxes and cupboards.

Photograph 4.3: New musical instruments (School A, 4 September 2016)

Photograph 4.4: Plastic aprons for paint activities (never been used) (School A, 4 September 2016)

[30] Translated from Afrikaans: "*So die department gaan vir my 'n hele "kit" stuur met die hele "toetie" binne. So hulle gaan dit vir ons stuur…groot boeke en CD's en goete en toys. Ek wag nou maar vir dit".*

Photograph 4.5: Old television and Toys used for fantasy play (School B, 6 September 2016)

Photograph 4.6: Posters and play cards displayed on notice-board (School A, 6 September 2016)

However, other resources were utilised often, for teaching purposes. I captured this observation in my field notes: "*Resources that were seemingly utilised for fine motor development that I observed in the classroom included containers with wax crayons, pencil crayons, lead pencils, scissors, paint brushes and powder paint* "(FN, 12 August 2016, lines 187-189). The teachers from Schools A and B explained: "*Paint…I think it is in that cupboard, powder paint and brushes…it is here somewhere…or perhaps in a box…but I do have the pencil crayons and scissors*[31]*"* (T1, I1, page 6). In support of this contribution, Photographs 4.7 to 4.9 depict the availability and use of wax crayons, pencil crayons, lead pencils, paint and paintbrushes. In Photograph 4.9, paint and paintbrushes were utilised during a creative arts activity, where learners decorated the letter "g".

[31] Transcribed from Afrikaans: *"Verf …dink dis in daardie kas…poeierverf en kwaste…dis hier iewerste…of in 'n boks in…maar ek het dit, draaikryte, skêre".*

Photograph 4.7: Examples of wax Crayones, glue sticks, lead pencils and pencil crayons kept in containers (School B, 10 September 2016)

Photograph 4.8: Scissors stored in a box (School B, 10 September 2016)

Photograph 4.9: Learners utilising available resources (pencil crayons, paint and paint brushes during a creative arts activity (School A, 6 September 2016)

4.6.3 Theme 3: Factors limiting Grade R learner-development and school readiness

Theme 3 relates to the factors limiting Grade R learners' development and school readiness levels, as evident at the two participating schools. The sub-themes captured under Theme 3 relate to language-related challenges, limited resources and the maintenance thereof, and expectations and stipulations of the curriculum. The inclusion and exclusion criteria for Theme 3 are summarised in Table 4.13.

Table 4.13: Inclusion and exclusion criteria for Theme 3

Theme 3: Factors limiting Grade R learner development and school readiness		
Sub-themes	**Inclusion criteria**	**Exclusion criteria**
3.1 Language-related challenges	All data indicating language-related challenges that can potentially hamper learners' development and school readiness	All data that refer to limited resources and maintenance of resources, or expectations and stipulations of the curriculum, that may hamper learners' development and school readiness
3.2 Limited resources and maintenance of resources	All data related to limited resources and the maintenance of resources at the Grade R facilities, that may limit learner-development and school readiness	All data that refer to language-related challenges or expectations and stipulations of the curriculum as factors that can hamper development and school readiness
3.3 Expectations and stipulations of the curriculum	All data implying challenges due to expectations and stipulations of the curriculum, which may negatively affect learners' development and school readiness	All data that refer to language-related challenges or limited resources and the maintenance of resources, that may hamper development or school readiness

4.6.3.1 Subtheme 3.1: Language-related challenges

The language of learning and teaching (LOLT) in the two schools that participated was Afrikaans at the time of my field work, with Afrikaans being the home language of approximately a third of the learners in both classes and the rest of the learners speaking a mixture of the other 11 official languages of South Africa. Based on my observations, I noted the following on language-related challenges: *"In terms of language, most learners spoke Afrikaans which was one of the LOLT of the schools*. *However, the rest of the learners represented the rest of South Africa's 11 official languages. This was considered as challenge"* (FN, 1 August 2016, lines 23-26). In

this regard, I further reflected on the difficulties one of the teachers reportedly experienced in dealing with learners who did not speak the LOLT. I noted: *"The fact that these learners did not understand Afrikaans, but their parents demanded that they should be in that school, and did not care as long as the teachers do their job. The teachers further stated that the children were suffering and it also gives them a lot of extra work"* (RJ, September 2016, lines 17-21). In support of my observations, one of the teachers said the following when reporting and exposed the challenges related to second-language speakers:

> Researcher*: "If a child cannot understand instruction in the LOLT, what other ways can you find to help a child to understand?"*
> *Teacher: "If there is work I would normally do an example to show them what to do and they will answer yes or no, they understand*".
> Researcher: "S*o you are saying that it basically comes down to when the child get a verbal instruction, and they don't understand the language; they struggle to perform?"*
>
> Teacher: *"Yes!"*
>
> *Researcher: "Do you think that it is a when preparing children for school, in other words preparing them to become ready for school?"*
>
> Teacher: "*The language?"*
>
> Researcher: *"Yes"*
>
> Teacher: "*It plays a big role; so yes, I do think it is a problem"* (T2, I1, page 13-14).

It therefore seems evident that there are language-related challenges that could have influenced learners' development and school readiness levels, as expressed by the teacher in the excerpts.

4.6.3.2 Sub-theme 3.2: Limited resources and maintenance of resources

As indicated in section 4.6.2.2, resources were available in both schools for the Grade R classes yet many of these resources seemed to be outdated, broken or incomplete with puzzle pieces, for example, missing. This situation led to feelings of frustration and teacher-participants' needs for more resources that they could utilise.

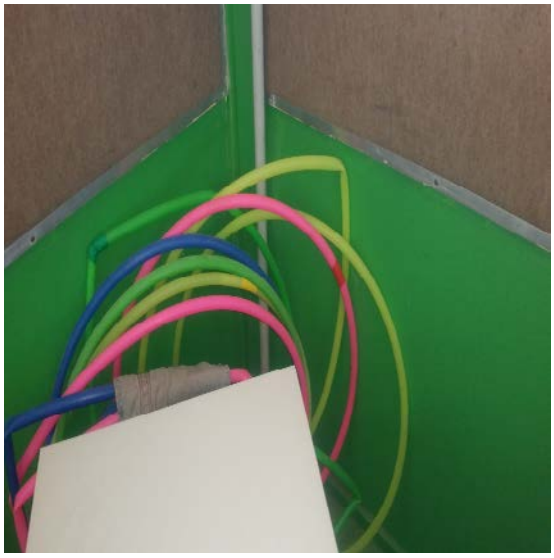
My first impression of both the Grade R classes was that they were overcrowded with too many children per square metre. Carpet areas were not big enough and some children had to sit on the floor (or carpet) during activities. Although all children were

seated at tables for certain activities, no attention was paid to left-handed children, resulting in children bumping into one another. My field notes on the classrooms are:

> "*School A- Classroom is room with tables and chairs that accommodate 37 Grade R learners. There are windows on two sides of the room but some of them are unable to be opened. Floors are swept but there is a lot of dust all over. There are many posters on the walls; some of them shop-bought, others made by the teacher. They all appeared old and tattered. School B had a similar layout. One classroom had a gaping hole in a huge part of the ceiling, indicating a classroom that was very cold during winter and extremely hot during the summer months"* (FN, 15 August 2016, lines 22-28).

In terms of the outdoor equipment and resources available at the two schools, I observed available equipment and resources to be fairly worn out. I got the impression that *"newer"* resources were perhaps kept stored away and only used as a reward for good behaviour, rather than making them available to all learners during break-time for outside activities with tennis balls and hula-hoops. The teacher seemed hesitant and unsure as to where these items were kept. She stated: "*The only stuff that we really have are those cars made out of wire. They can play with them outside (hesitant), however the only stuff they actually play outside with are the tennis balls (where are they?) and then the hulas…*[32]*"* (T1, I1, page 6). Furthermore, I did not observe any learner playing with any outdoor equipment during free play periods (outdoor play), apart from handling pieces of wood or old bottles that they picked up on the playground (RJ, 15 September 2016, lines 570-573). In support of my observations, Photographs 4.10 to 4.12 depict the state of the hula-hoops, outdoor equipment and the general state of the playgrounds.

[32] Translated from Afrikaans: "*Wat ons nou rerig het is net daai karretjies (draadkarre), wat hulle ook mee buite speel, en wat ons mee kan buite speel is dit en dan het ons tennisballe…waar is dit? …en dan het ons die hulas ook".*



Photograph 4.10: Bent and broken Hula-hoops (School A, 6 September 2016)

Photograph 4.11: General state of the playground of School A, 6 September 2016)

Photograph 4.12: General state of the playground of School B (16 September 2016)

Upon further exploration, the teacher from School A explained the conditions around their playground, kinds of outdoor equipment and classroom resources as follows:

> "*Outside we have a playground, but it is not being enough at all. Because we only have three swings and they have to make turns to use it. That is fine because now they know how to play together but then it is 37 children, all of them can't play on the swing during break as break is only 20 minutes. Then we need more play equipment for them… we only have one slide. They all climb on it and then they play there and they might even get hurt, because they are too much on the slides. We do have tyres but they do not actually really use it*

and we have a sandpit but we do not have toys that they can use in the sandpit. They only have the sandpit, so basically what they do is they play in the sand and throw each other with the sand" (T2, I1, page 10).

Photograph 4.13: Outlay of playground with jungle-gyms and swings (School B, sand 16 September 2016)

Photograph 4.14: The "sandpit" – an old tractor tyre, with very little in it (School B, 16 September 2016)

In support of this observation, Photographs 4.13 and 4.14 provide visual evidence of the resources available at School A. It is evident from these photographs that there is a lack of maintenance, as swings are broken. In addition the "sandpit" is an old tractor tyre, with almost no sand in it to play with. It is also clear that there is no grass for children to sit and play on. The overall appearance of equipment is that everything needs to be fixed, painted and maintained. Generally the outdoor playground was not very child-friendly.

In the outdoor play areas, I observed limited resources and environments/spaces that did not provide optimal opportunities for learners' development. I noted the following (FN, 6 September 2016, lines 198-204; also refer to Photographs 4.11. 4.12, 4.13 and 4.14):

- *"Playgrounds: Lack of maintenance*
- *Sandpits in need of sand and toys*
- *No grassed areas*
- *No areas for outside games*
- *No paved areas*
- *Limited areas where children could sit*

- *Dusty*
- *Lots of papers lying around".*

More specifically, the playground at School A is an enclosed area with two jungle gyms, swings, a few tyres and a sandpit with little sand in it. There is no space for running around. There are too few types of equipment for the number of children; and this leads to children fighting, arguing and eventually crying. Both schools have playgrounds that are separate from the primary schools' play areas. At the time of my field work, there was no grass, just sand and very dusty areas. A few trees were growing around the fence, but did not really provide a lot of shade in the summer time. Both schools had sandpits. I reflected on the above by noting: *"No other resources are provided; for example, hula-hoops or balls. A sandpit is available, but nothing to play with in the sand"* (FN, 6 September 2016, lines 204-207).

Due to little or no maintenance done in the playground area, there was no grass when I observed the two Grade R facilities. On a rainy day I noted: *"On arrival at the school, children came back from toilet routine. Today there was no playing outside as the whole playground was wet and muddy"* (FN, 31 August 2016, lines 178-180). All my observations point to limitations in terms of outdoor stimulating environments for the Grade R learners. Teachers elaborated on the limited resources and lack of maintenance by making the following statements:

- *"…like outside play, water play and sand play…we don't have any of those resources, although we have a sandpit…it's all good…but the thing is I know that we need to put salt in and it needs to be kept damp…but we don't have that and you cannot ask for anything because you are told that there is no money to do those things. The kids need to do this, but it is a bit of a struggle at this school*[33]*"* (T1, I1, page 4)
- *"Outside we have a playground. But it is not big enough at all. Because we only have three swings and they have to make turns to use it"* (T2, I1, page 10)

[33] Transcribed from Afrikaans: *"soos die buitespel, die waterspel en sand…ons het nie daardie geriewe nie en alhoewel die sandput daar is….goed en wel…maar die ding is ek weet daar moet sout ingegooi word en dit moet nat gemaak word…maar ons het nie daai nie en jy kan niks vra nie, dan hoor jy daar is nie geld nie…maar daar is geld om die goeters te kan DoEn. Die kinders moet dit DoEn maar dis nogal bietjie 'n gesukkel hier by die skool".*

- *"…. they might get hurt, because they are too much on the slides…"* (T2, I1, page 10)
- *"Then we need more play equipment for them, like..we only have one slide. They all climb on it and then they play there and they might even get hurt, because they are too much (*many) *on the slides. We have a sandpit but we do not have toys that they can use in the sandpit. They only have the sandpit, so basically what they do is they play in the sand and throw each other with the sand"* (T2, I1, page 10).

Hence, it is evident that teacher-participants were of the opinion that resources were limited and this created challenges during their preparation of Grade R learners to become school ready. Coupled with this, was the lack of finances which can be linked to indoor and outdoor resources being inadequate. The lack of maintenance of these resources can also be blamed on financial woes of the school.

4.6.3.3 Sub-theme 3.3: Expectations and stipulations of the curriculum

Expectations and stipulations of the curriculum was considered as a challenge in preparing the Grade R learners for formal schooling. During one of the mornings when I visited School A, I observed and noted the following in my reflective journal: *"I arrived at school at 09:00. Learners were seated at their tables, busy doing filing"* (RJ, 23 September 2016, lines 71-73). This (the filing of work done in compilation of a portfolio) seemed to be a common occurrence. It is required by the Department of Education (CAPS, 2011) to keep a learner's portfolio as proof of evidence of the work done at school. I further reflected by stating that: "*They were filing worksheets into their portfolios of evidence"* (RJ, 23 September 2016, lines 74-75). In order to get the *"filing"* done, learners' names were called out, and they collected their work from the teacher and it was then placed with great effort into plastic sleeves by the learners. My opinion was that this took up time when actual teaching activities could have taken place. Teachers, however, indicated that this was expected of them and contributed the following:

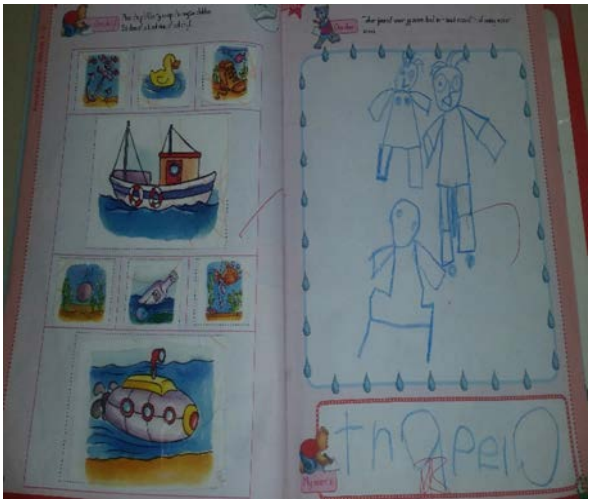
- *"You know…the reason why we miss out on the important things is because of our HODs. They are your seniors and they are very much focused on things that*

do not make sense. Like our HOD…they know nothing about Grade R and what is supposed to happen here, but they pressurise you with controls, and everything must be perfect, and that causes that I cannot do what I am supposed to do" (T1, I1, page 3)

- "*The focus of these things (workbooks) does not make a lot of sense to me. There is so little time for the things that really matter. …They only do one or two pages at a time…the emphasis of the book is more on the stickers. There is not much in the books"* (T1, 1, I1, page 6).

Similarly, I observed that the teachers constantly made use of the workbooks that are prescribed by the Department of Education (CAPS, 2001). Much focus was placed on completing activities in the workbooks and worksheets with, according to the teachers, limited time to take children outside for physical education (perceptual-motor development), or for activities in the creative-arts, music and movement. One teacher-participant expressed her opinion on the workbooks that form an integral part of the daily programme. Although she was of the view that there is not much in terms of educational value in the books, it was expected by the HOD that this be done. With reference to the above excerpts, my observations and reflections, Photographs 4.15 and 4.16 depict some examples of activities learners completed in the workbooks.

Photograph 4.15: Example taken from CAPS (2011) workbook (School A, 16 September 2016)



Photograph 4.16: Example taken from CAPS (2011) workbook (School B, 16 September 2016)

What appears evident was that the workbooks mostly became the main activity of the day. The workbooks seemed to mostly support visual perceptions and most activities require learners to pull off stickers and paste them on relevant open spaces. In most of the workbooks stickers do not come off easily and tear easily. This caused learners to become upset and demotivated. Workbooks were then collected, marked by the Grade R teachers, and were used as evidence of learners' quality of work during parent days.

Moreover, the teachers generally felt constrained/pressurised by the authorities implying that there is a disconnection between authorities, the curriculum and what works in class. One teacher-participant stated the following:

- *"The focus of these things (workbooks from Department of Education) does not make sense. There is not much time for the things that really matter…There is not much in those books*[34]*"* (T1, I1, page 4)
- *"It should not be the main activity*[35]*"* (T1, I1, page 4).

Consequently, I came to the conclusion that teachers felt that because of the system, they were unable to deliver quality teaching. They followed the primary schools' bells that announce the beginning and end of periods, resulting in further restrictions and limitations from the curriculum and authorities, causing Grade R to become a *"watered-down Grade 1"*.

4.7 CONCLUSION

I presented the results of the study in this chapter. I commenced by providing the quantitative results I obtained, in terms of the ASB and SRDA test scores obtained both prior to and after the intervention. I then discussed the qualitative results I obtained in terms of the themes and sub-themes I identified during the thematic data analysis which I completed to supplement and inform the QUAN results.

[34] Translated from Afrikaans: *"Hierdie goed (werksboekies) se fokus maak nie vir my so baie sin nie. Daar is min tyd vir al die ander dinge wat saak maak".*
[35] Translated from Afrikaans*: "Maar dit moenie die hoof aktiwiteit wees nie".*

In Chapter 5, I present the findings of my study by situating and interpreting the results I obtained in terms of the existing body of knowledge. I highlight similarities and inconsistencies between existing literature and the results I obtained, by comparing the results I presented in the current chapter with my literature review in Chapter 2.

CHAPTER FIVE:

FINDINGS OF THE STUDY

5.1 INTRODUCTION

In the previous chapter, I presented the results of the study. I commenced by providing the quantitative results I obtained, in terms of the ASB and SRDA tests. I included the pre-intervention and post-intervention data, indicating the participants' levels of school readiness during these two phases of the study. Next, I discussed the qualitative results I obtained in terms of the themes and sub-themes I identified during thematic data analysis as supplement to the QUAN results.

In this chapter, I interpret the results of the study against the background of the literature I consulted and discussed in Chapter 2. I foreground correlations, contradictions as well as silences when comparing the results of the current study to existing literature.

I completed this study in three phases, namely a pre-intervention QUAN and qual data collection phase, the development of a perceptual-motor intervention programme, and a post-intervention QUAN data collection phase. In this chapter I discuss the findings I obtained pre- and post-intervention based on my integration of the QUAN and qual results I obtained. I then compare the results of the first and third phases in order to present the findings on the outcome of the intervention that was developed and implemented during the second phase of the study. As an introduction, Figure 5.1 provides an overview of the process I employed in formulating findings.

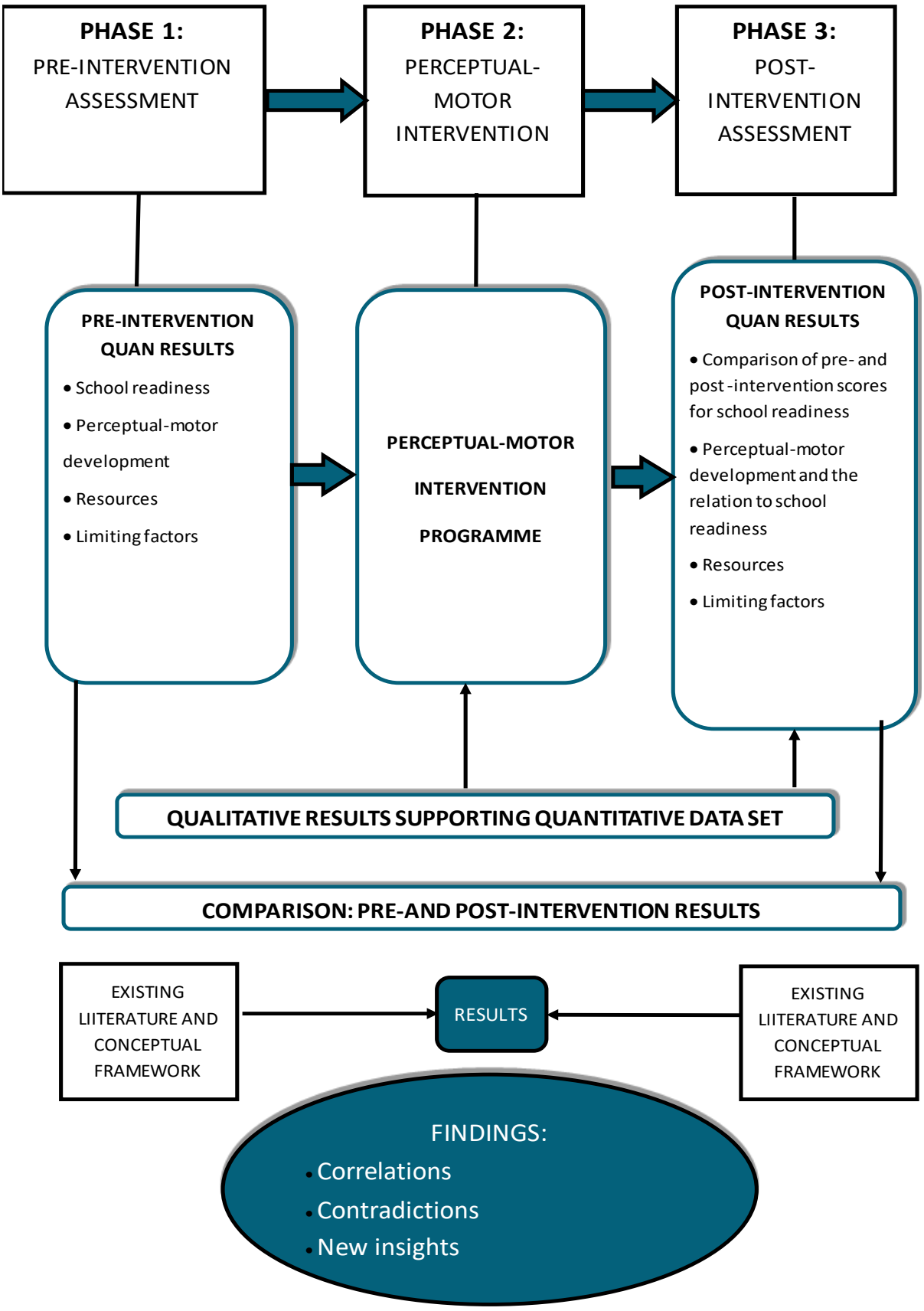


Figure 5.1: Formulating findings

5.2 PRE-INTERVENTION PHASE FINDINGS

In this section, I discuss the findings for Phase 1 of my study, referring to the school readiness and perceptual-motor development of the learners prior to the intervention, as well as the relation between the two concepts. Furthermore, I present findings on the resources available at the participating schools, and factors limiting Grade R learners' development and school readiness levels.

5.2.1 School readiness of the Grade R learners prior to the intervention

In Chapter 2, I provided a detailed description of school readiness. In essence, school readiness is seen as a broad concept that includes different developmental domains such as physical development (which includes perceptual-motor development), cognitive development, social development, emotional development and moral development. According to (Britto, 2012:9), *"a child who is ready for school has the basic minimum skills and knowledge in a variety of domains that will enable the child to be successful in school"*. In the current study, I assessed the levels of school readiness of the Grade R learners prior to and following an intervention, by means of the ASB (Olivier & Swart, 1988) and SRDA (Van der Berg, 2014) test instruments. The SRDA was designed to provide a profile of Grade R learners in terms of their school readiness, focusing on perceptual-motor skills that are important for the subject areas of language, mathematics and life-skills.

Based on the results of the pre-intervention assessment, I found that the participating Grade R learners (both experimental and control groups) obtained poor school readiness scores (as indicated in Chapter 4, Table 4.3). Seven of the eight sub-tests that form part of the ASB tested weak and very weak for the learners of both schools, and below the average standard score of 3 (Olivier & Swart, 1988). The pre-intervention average scores for the ASB sub-test were namely 2.4 (School A) and 2.3 (School B), indicating that learners in both groups were not school ready prior to the intervention being implemented.

Similarly, pre-intervention results obtained on the SRDA test (indicated in Chapter 4, Table 4.4), show that learners tested below the expected level for school readiness on three of the seven tests that form part of the SRDA. According to the SRDA sub-

tests results, the Grade R learners from both groups obtained low scores for mathematical/numerical ability (Sub-test 4) with averages of 49% (School A) and 51 % (School B); language, cognitive thinking and auditory perception (Sub-test 6) with averages of 48% (School A) and 47% (School B); and Socio-emotional development (Sub-test 7) with averages of 42% (School A) and 46% (School B). The pre-intervention average score of school readiness on all the sub-tests showed scores of 57% (School A) and 58% (School B). As such, these scores of just above the average score of 50% indicate that the learners from both schools exhibited school readiness when considering all sub-tests, despite them underperforming on sub-tests that measure key areas of functioning that are important for formal schooling, as indicated above.

Therefore, the results obtained during the pre-intervention phase of my study indicate that on average, learners were ready for school according to the SRDA but not ready for school according to the ASB. However, a large number of perceptual-motor skills necessary for academic success in school, according to Pienaar et al. (2014) and Mohamed (2013) were not sufficiently developed and tested below average on both instruments. More specifically, the following perceptual-motor skills and developmental domains tested below average on both the ASB and SRDA tests: eye-hand coordination, mathematical concepts, number concept, number names, symbols, visual integration, visual closure, visual analysis and synthesis, auditory memory, auditory analysis and synthesis, auditory closure, auditory association and classification, listening skills, and spatial orientation. This implies a relation between perceptual-motor development and school readiness as measured on the ASB, which is confirmed by the results I obtained during the pre-intervention phase on the ASB, where learners tested poorly.

In this regard, Pienaar et al. (2014) state that perceptual-motor skills contribute to a variety of basic learning skills associated with academic success, and can be considered as core building blocks for academic success in basic learning areas. Mohamed (2013) similarly emphasises that essential concepts will develop from and is based on perceptual processes, which are necessary for language and the cognitive development and performance of learners entering Grade 1.

5.2.1.1 School readiness in resource-constrained contexts

As mentioned in my literature review (Chapter 2), early childhood is viewed as a critical phase in human development, specifically in terms of social, emotional, cognitive and physical well-being. In this regard, Atmore et al. (2013), De Witt and Booysen (2007) as well as Sherry and Draper (2012) state that global emphasis on ECD is critical in attempting to address inequality and poverty. At a national level, the South African Government and DBE recognise the importance of ECD. Even though Grade R has been made compulsary for all children in South Africa, the academic performance of young children, especially in the Foundation Phase in public schools, is not yet up to standard (Atmore, Van Niekerk, & Ashley-Cooper, 2012; Berry, Biersteker, Dawes, Lake, & Smith, 2013; Biersteker, 2010b; DoE, 2011b).

Existing literature further indicates that school readiness among learners in resource-constrained settings are often not up to standard and that many learners in South Africa are not ready for formal education in Grade 1 (De Witt, 2016; Erasmus et al. 2016). These learners usually attend Grade R in either quintile 1 or quintile 2 schools – schools characterised by limited resources. Atmore et al. (2012), Berk (2013), Bierman and Boivin (2014), De Witt, (2009), Moletsane (2012) as well as Neves (2012) concur and elaborate that learners from resource-constrained settings often lack sufficient perecptual-motor stimulation, and supportive environments. As a result they generally face deprivation on various levels which can negatively influence their holistic development and productivity later in life (Berk, 2013; De Witt, 2009; Neves, 2012). Hence, limited resources and the lack of a stimulating environment can adversely affect levels of school readiness, indicating an important relation between these two aspects.

Taking the background (resource-constrained) and context (quintile 2 school) of the participating Grade R learners into consideration, the results obtained from the ASB and selected sub-tests on the SRDA therefore correlate with existing literature. In this regard, Biersteker (2010a), Erasmus (2012), Neves (2012) and Van Zyl (2004) concur that learners from resource-constrained backgrounds tend to have lower levels of school readiness due to the lack of perceptual-motor stimulation in the early years. Isaacs (2012) similarly indicates that only 48% of a sample of learners involved in his

study, coming from a resource-constrained setting, were not ready for school. This implies that the learners who participated in my study were not ready for formal education according to the results obtained from the ASB; however, results from the SRDA indicated learners to be ready, although school readiness averages were only slightly above 50%, at the time of the pre-intervention assessment. My findings also imply the possibility of a lack of sufficient perceptual-motor stimulation – probably as a result of participants' early-learning experiences, as confirmed by existing literature.

5.2.1.2 Factors influencing Grade R learners' development and school readiness in resource-constrained settings

Atmore et al. (2012) indicate challenges such as poor infrastructure, lack of proper nutrition, underqualified/underprepared teachers and an absence of professional development, as barriers that may impact negatively in achieving quality education. These authors add that serious challenges and obstacles within the South African education system include the absence of adequate learning materials and resources, minimal financial support, and insufficient qualified teachers. These factors may have influenced the school readiness scores pre-intervention, as I observed a lack of resources and learning materials, as well as underqualified teachers during my field work for both the participating schools.

5.2.1.2.1 Language as limiting factor

The quantitative results I obtained indicated that the participating Grade R learners' language, cognitive thinking and reasoning, and auditory perceptions tested below average prior to the intervention. Sub-tests 3 (Reasoning) and 8 (Verbal comprehension) of the ASB indicated below average scores of 2.5 (School A) and 2.1 (School B) for sub-test 3, and scores of 1.8 (School A) and 1.4 (School B) for sub-test 8. Results on the SRDA indicate that, although the averages of both schools were just above average for the Language, cognitive thinking and auditory perception test at 56% (School A) and 50% (School B), the auditory perceptual skills sub-tests associated with this area tested below average, as summarised in Table 5.1.

Table 5.1: Summary of percentages of learners who tested below average on the SRDA Sub-test 6 (Auditory perceptual skills) pre-intervention

Auditory perceptual skills	**Percentage of learners School A (N=33)**	**Percentage of learners School B (N=25)**
Auditory memory and cognitive thinking	76	80
Auditory memory with motor integration and position in space	21	24
Auditory discrimination	46	52
Auditory analysis and synthesis	88	56
Auditory closure	73	56
Auditory association and classification	90	80
Word association	60	56

These results are furthermore supported by the qualitative data I obtained during the semi-structured interviews which I conducted with the two Grade R teachers. The participating teachers expressed great concern and emphasised the challenge of many of the learners not being able to communicate in the language of learning and teaching (LOLT) and as a result, not performing optimally. In the case of my study the LOLT was Afrikaans, with many of the learners' home language not being Afrikaans. My observations furthemore confirmed that many learners often did not understand the instructions given to them, and as a result did not necessarily know what was expected of them.

A further implication when teaching a learner in a second language, relates to the task for teachers to ensure that learners feel competent and confident to continue learning through the LOLT of the school despite this not being their first language. It is thus, according to Wessels and Phatudi (2015), pivotal that teachers create an accommodating and responsive teaching and learning environment. In my study, the fact that most learners were not fluent in the LOLT may have significantly affected the scores of the school readiness tests, indicating that learners mostly peformed below average on the language-related sub-tests, as captured in Table 5.1. These results confirm the relation between perceptual-motor development and school readiness, as the auditory perceptual skills necessary for language development and cognitive thinking were mostly below average for the participating learners.

As such, a major concern in my study relates to the LOLT of the participating Grade R learners. As mentioned by Wessels and Phatudi (2015), the South African context with 11 official languages adds to the problems currently experienced in education. The fact that the majority of the learners in South Africa attend school in a language that is not their home language contributes to findings that learners do not and cannot perform as expected. To this end, it is generally accepted that learning done in one's home language is a key factor in educational success, which is not the case in the current study.

In response, the participating Grade R teachers indicated that they tend to assist such "struggling" learners to understand instructions and activities by repeating instructions and helping individual learners to cope. Also, the teachers indicated that they utilised the limited resources available to assist with the learning experience. This result indicates that, although circumstances may not be ideal in South African resource-constrained settings, Grade R teachers are willing to assist learners who face challenges and experience problems in understanding instructions and subject-content due to language difficulty.

A related interesting finding of my study indicates that, although the participating teachers showed a narrow view of school readiness and mostly focused on mathematics and language as part of the daily programme, these were the exact two areas that showed the biggest deficit in terms of the learners' school readiness levels prior to the intervention. Hence, it can be hypothesised that this may be as a result of insufficient training or a lack of knowledge of different strategies to teach learners basic skills in a second language. These findings furthermore imply that teachers' limited understanding of the relation between school readiness and perceptual-motor skills may influence the quality of teaching and learning opportunities created for Grade R learners. All these possibilities are however mere hypotheses; that require further investigation before reaching conclusions.

5.2.1.2.2 Implementing the expectations and stipulations of the Grade R curriculum

The findings I obtained concur with a study conducted by Clasquin-Johnson (2016), indicating that curriculum implementation is highly dependent on teachers' knowledge,

skills, beliefs and attitudes. In addition, external factors such as professional development, resources and instructional support play a significant role which can enhance the level of teaching. Clasquin-Johnson (2016) states in this instance, that teachers will generally follow the curriculum as a *"script"*, not necessarily allowing children to learn through play, and explore through their senses and bodies when gaining knowledge.

Based on the qualitative results I obtained, it seems clear that the Grade R learners in the current study spend most of their learning time inside the classroom, behind desks or on the carpet, rote-counting or repeating words and sentences. These activities therefore imply the main teaching and learning strategies that were implemented at the time of my study. The focus of the daily programme primarily centred around language and mathematics, with limited focus on creative arts, prior knowledge, physical education, and the personal and social well-being of learners, which can support the holistic development of the child. In the current study, carpet-based activities were often followed up with activities from a workbook that is supplied and prescribed by the Department of Basic Education (CAPS, 2011).

During the semi-structured interviews I conducted, one teacher in this regard stated that it is expected by their HOD to work from the workbooks and complete prescribed worksheets as these provide concrete evidence of the work that had been done and can be displayed during parent evenings. In doing so, parents could *"see"* the work completed by their children. Even though the teachers seemed aware of the different activities involved when following an integrated approach (such as the integration of mathematics, language and life skills through play-based approaches, as stipulated by the CAPS document), they apparenly did not implement this. Their teaching approach was instead focused on more formal and teacher-directed activities, which could possibly lead to teaching a watered-down curriculum, almost like a *"mini Grade 1"* (Excell & Linington, 2015).

These findings suggest that the learners participating in the current study were probably not provided with sufficient teaching and learning opportunities that would enable them to learn through their bodies and senses by exploring concrete objects. The quantitative results (low school readiness levels) I obtained, are supported by the

qualitative results, providing the means for the conceptual premise that, by implementing a perceptual-motor intervention, learners may be assisted through informal and play-based methods to aquire the necessary perceptual-motor skills for success when starting to engage in activities such as formal reading, writing, and mathematics in Grade 1.

5.2.1.2.3 Narrow view of school readiness by Grade R teachers in resource-constrained school contexts

As stated previously, school readiness implies a multi-dimensional concept that includes the various developmental domains, as described in Chapter 2. Britto (2012), High (2008) as well as McGettigan and Gray (2012) state that school readiness also implies dimensions of a learner being ready for school, the schools' readiness for learners, and the family and community's readiness for educating their children.

Despite this broad explanation of what school readiness entails, I found that the two Grade R teachers who participated in my study held a narrow view of school readiness. The participants did not view school readiness as a broad concept but rather described the concept as one-dimensional, only focusing on the cognitive development of learners, with specific focus on language and mathematics. They did not seem to be aware that school readiness implies five different developmental domains. In addition, the participating teachers only focused on the learners who had to be ready for school in expressing their understanding. They did not consider the idea that both the school and parents also required to be ready – thus, once again, confirming a narrow view of school readiness.

This narrow view of school readiness by the teachers in this resourced-constrained setting, may possibly be linked to the low levels of school readiness that I found amongst the Grade R participants. As only two teachers participates in one interview each, this issue may require further investigation in similar contexts, involving more teachers, in order to come to a more definitive conclusion.

Another possible reason for teachers' narrow view of school readiness may be related to limited training or quality of training, even though I did not assess this as part of the current study. I base this possibility on the ideas of Clasquin-Johnson (2016) who

indicates that unqualified or underqualified teachers will tend to follow the curriculum as a script, which can in turn result in a watered-down and formal approach to implementation of the Grade R programme. By following such an approach, learners may not be encouraged to learn through play to explore through their senses and bodies in order to gain knowledge and develop optimally. Such an approach may also limit learning and teaching opportunities for learners to develop pereceptual-motor skills, which are pivotal for learning areas such as language and mathematics. In observing the teaching that took place in the two Grade R classrooms, I found that teachers implemented most of the activities stipulated in the CAPS (2011) teacher's manual. These acitivites were mostly teacher-directed, where teachers instructed learners in terms of what to do and how to do it, as also indicated in the findings of Clasquin-Johnson (2016).

Excell and Linington (2011) add that a focus on the didactic aspects of teaching and table-top activities such as worksheets and workbooks may limit the possibility of optimal dvelopment. Results from the qualitative data I obtained during the semi-structured interviews and observations partially confirm this idea as both teachers viewed school readiness in terms of learners being able to follow instructions, relate to messages and provide feedback. As such, their (limited) view of what can be expected of Grade R learners to be school ready may have affected their promotion of the readiness of the learners. This is however a mere hypothesis that requires further research.

5.2.1.2.4 Effect of the learning environment and available resources

Existing research indicates a link between children and their environments in terms of their school readiness (Bredekamp, 2011; De Witt, 2009). In addition to the environment, teachers fulfil distinct roles in preparing children for formal schooling (Bredekamp, 2011; De Witt, 2009). According to these authors, a child who functions in a stimulating educational environment will be better prepared for formal schooling. The quantitative results of the current study support this contribution, as the school readiness levels of the participating Grade R learners coming from a resource-constrained context, tested low,

In support, the qualitative results I obtained indicate limitations in terms of both the indoor and outdoor environments of the participating schools, which were not up to standard at the time of my study. This observation concurs with the work of Bredekamp (2011), Britto (2012) and De Witt (2009), who state that learners who function in stimulating educational settings and favourable circumstances are systematically and gradually prepared for learning and formal schooling. The qualitative results of my study indicate that in cases where resources were available at the participating schools, most were outdated, incomplete or not properly maintained.

Therefore, for optimal learning and teaching to take place, it is important that learners feel safe and comfortable in the learning environment; they must have access to a learning environment that is stimulating, challenging, consisting of different areas that can allow for opportunities for large groupwork, small groupwork as well as individual work. However, in the participating classrooms, it was evident that few opportunities were provided for small group activities and individual work. Teaching was rather directed at the whole class, resulting in the hypothesis that learners' school readiness was not being optimally supported due to their limited engagement with the learning content which can be done in an enriching manner. This is however a mere hypothesis that requires further research.

In addition, I observed anomalously that although resources were outdated, many of them were not utilised at all. Most activities were done in the workbooks and on copied worksheets that formed part of the learners' resource packs. During qualitative data collection, I observed that these workbooks mostly consisted of a sticker system where learners had to paste stickers in suitable spaces.

In terms of the outdoor learning areas that can potentially encourage children's holistic development, more specifically their physical development, these also required maintenance at the time that I conducted my study. Fixed apparatus such as jungle gyms were available, yet were not sufficient in terms of the number of Grade R learners. These apparatuses were also not well maintained. Similarly, sandpits were available, but needed more sand and maintenance.

In addition, no paved areas with hopscotch, footprints, and lines could be observed at any of the two schools. Even though limited equipment such as hula-hoops and tyres were available, no balls, balancing boards or skittles were seen. Therefore, as the indoor and outdoor environment, including available resources, play a pivotal role in the development of young children, as well as preparing them for formal schooling, a lack of these resources may have affected the school readiness and perceptual-motor development of the participating Grade R learners. This finding relates to the work of De Jager (2014) and De Witt (2016) who also emphasise that learners who function in a stimulating educational setting, where favourable circumstances are being created for learning, can be prepared for formal schooling in a systematic and gradual manner, supporting academic achievement in reading, spelling and mathematics in Grade 1 (Mohamed, 2013).

5.2.2 Perceptual-motor development prior to intervention

As already indicated, perceptual-motor skills development is regarded as important for school readiness (De Witt, 2016; Van Zyl, 2011; Loubser, 2015). They describe perceptual-motor development as a three-way process, including perception, interpretation and response. Loubser (2015) maintains that this process is pivotal to a learner's refinement of perceptual-motor integration and coordination. Gallehue and Ozmun (2006) agree that perceptual skills should be refined by the ages of six to seven years, as they are crucial to support school-based activities such as reading, handwriting and mathematics (Loubser, 2015).

Erasmus et al. (2016) posit that learners from resource-constrained settings are as a result of poverty, generally malnourished, live in homes that may be dysfunctional and live in an environment that lacks stimulation. As a result, these learners tend to be more vulnerable and display perceptual-motor deficits more commonly. The study of Erasmus et al. (2016) supports the quantitative results I obtained on the pre-intervention assessment. More specifically, as indicated in Table 5.1, the perceptual skills required for formal education such as auditory perception skills that are required for language (through which all teaching and learning take place) tested below average for most of the learners who participated in the current study.

During the interviews I conducted with the two participating Grade R teachers, their responses to the questions on perceptual-motor development and its relation to school readiness indicated their limited understanding of what perceptual-motor development entails. In addition, they displayed a lack of understanding of the relationship between school readiness and perceptual-motor development. Based on these findings, the possibility exists that a limited understanding of the meaning and importance of perceptual-motor development could have affected the teachers' teaching and focus on the school readiness of their learners. This hypothesis however requires further research.

5.3 POST-INTERVENTION PHASE FINDINGS

Existing literature confirms the fact that structured interventions can promote learner-development by adressing the different developmental domains in order to promote holistic development (Berk, 2001; Halle et al. 2008; Van der Ven, 2008). Gallehue and Ozmun (2006) concur by stating that perceptual-motor programmes can be effective when implemented among learners who are challenged in terms of their socio-economic environments or backgrounds. Gallehue and Ozmun (2006) add that such programmes should include multi-sensory experiences and perceptual-motor activities.

I applied the reccommendations of Gallehue and Ozmun (2006) and focused on concrete and multi-sensory experiences when developing the percepual-motor intervention programme for the current study. My design of the intervention programme was also guided by the work of Excell and Linington (2011), who believe that children's learning should follow three phases, with learners first experiencing concepts kinesthetically (through their bodies and movement), then three-dimensionally (through the exploration of concrete apparatus) and thirdly through pen and paper activities.

The perceptual-motor intervention used in this study therefore included activities that focused on the perceptual-motor skills that tested below average during the pre-intervention phase. Based on existing studies such as that of Gallehue and Ozman (2006) which emphasise that perceptual abilities are dependent on motor activities,

the perceptual activities I included in the intervention programme all comprised of a motor component.

According to De Witt (2009), learners need to establish a broad base of motor skills experience in order to be able to develop higher learning functions to perform at an acceptable level. Thus, learners' motor abilities, which impact on perceptual skills, are seen as essential tools for learning.

As indicated in Chapter 2, the perceptual-motor intervention programme was implemented over an eight-week period. During implemetation I compiled detailed notes based on my observations. I focused on how the programme was facilitated by the Grade R teacher. In addition I observed the perceptual-motor skills that the intervention aimed to develop, and whether or not the outcomes of the perceptual-motor activities were achieved.

After implementation of the intervention, I instituted the same two school readiness tests used for pre-intervention assessment, in order to determine the effect of the perceptual-motor intervention programme on the school readiness levels of the participating Grade R learners by comparing the pre- and post-intervention test scores. Results on both the ASB and SRDA indicated an increase in the school readiness levels of the participants (discussed in more detail in the next section), as captured in Chapter 4, Tables 4.7 and 4.8. Even though the ASB scores showed an increase in performance, they remained mostly below the average score of 3. Grade R learners, however, demonstrated significant progress on the SRDA test battery after the intervention. When comparing the mean difference between schools with regard to the post-intervention scores, the p-value of the ASB post-test namely showed a score of $p>0.0002$, indicating a statistically significant result. With regard to the SRDA the post-intervention scores had a p-value of $p<0.0726$, indicating that, although the experimental group had a higher average post-score than the control group, the difference is not statistically significant.

More specifically, seven of the eight sub-tests that form part of the ASB (refer to Chapter 4, Table 4.6), still tested weak and very weak for the learners of both schools, and below the average standard score of 3 following the intervention (Olivier & Swart, 1988), although mean averages indicated an increase in the scores. The post-

intervention average scores for the ASB test were 2.7 (School A) and 2.09 (School B), indicating that learners in both groups were still not school ready post-intervention.

Similarly, post-intervention results obtained on the SRDA test (presented in Chapter 4, Table 4.7), indicate that learners tested above the expected level of school readiness on all seven of the tests that form part of the SRDA. According to the SRDA results, the Grade R learners obtained average scores of 65% (School A) and 58% (School B) for mathematical and numerical ability (Sub-test 4), 56% (School A) and 50% (School B) for Language, cognitive thinking and auditory perception (Sub-test 6), and 55% (School A) and 45% (School B) for Socio-emotional development (Sub-test 7). The post-intervention average scores for school readiness on all the sub-tests showed scores of 68% (School A) and 63% (School B). As such, these scores are above the average score of 50% thereby indicating that the learners from both schools tested school ready after the intervention, when considering all sub-tests, despite School B underperforming on Sub-test 7, that measure key areas of functioning that are important for formal schooling, as indicated. As such the increase in results on both the ASB and SRDA indicates that the perceptual-motor intervention had a positive effect on the school readiness levels of the Grade R participants.

The quantitative results from the post-intervention tests are consistent with other known projects such as the *Head Start* and *High/Scope Perry Preschool* studies (Anderson et al. 2013; Schoen, 2011) that provide examples of the positive effect of intervention programmes on learners' school performance and later achievement in life (Berk, 2013; Schoen, 2011). The results I obtained also align with the studies conducted by Rossi and Stuart (2007) as well as Pienaar et al. (2011) where improvement occurred in various areas of perceptual-motor skills such as midline crossing, laterality, directionality, spatial awareness, concentration, handwriting ability and language ability, following the implementation of a structured intervention. These findings have important implications for developing perceptual-motor intervention programmes to support the school readiness levels of Grade R learners. In this regard Pienaar et al. (2014) concur with Mohamed (2013) by emphasising that perceptual-motor skills will contribute to academic success.

Further implications of the quantitative findings I obtained relate to the way in which the perceptual-motor intervention programme was designed with its focus on concrete and multi-sensory activities, presumably resulting in an increase of school readiness levels of the praticipating Grade R learners. In this regard, it is important to emphasise that the intervention was implemented to enrich the current Grade R curriculum, and not to replace it. By implementing it in this way, it added value to the daily teaching programme and learning experiences provided in class.

5.4 COMPARISON OF PRE- AND POST-INTERVENTION RESULTS

In Chapter 4, Tables 4.7 and 4.8, I presented the differences of the average scores of the experimental and control groups pre- and post-intervention. As indicated in Table 4.7, a significant difference is evident between the two groups. The p-value of the ASB test showed a value of $p>0.0002$, thereby indicating a statistically significant difference when pre- and post-intervention scores are compared. The ASB mean average of the experimental group pre-intervention to post-intervention further increased from 2.18 to 2.71. The ASB mean average of the control group pre-intervention to post-intervention, however, showed a decrease from 2.4 to 2.0. To this end, the post-intervention mean scores of school readiness of the two groups showed a statistically significant difference. The experimental group showed an average of 2.1 pre-intervention and 2.7 post-intervention. The control group had a score of 2.4 pre-intervention and 2.0 post-intervention, thus implying that the perceptual-motor intervention programme resulted in a statistically significant score indicating the increase of school readiness scores between the experimental and control groups.

After implementation of the perceptual-motor intervention programme on the ASB, statistically significant scores applied to Sub-test 4 (Numerical ability), Sub-test 5 (Gestalt) , Sub-test 6, (Coordination) and Sub-test 8 (Verbal comprehension). Table 5.2 provides a summary of the average scores obtained by the experimental and control groups both pre- and post-intervention on the sub-tests with statistically significant scores.

Table 5.2: Statistically significant scores on the ASB (Sub-tests 4, 5, 6 and 8)

Test battery	Pre-intervention/ Post-intervention	Group (mean)		Mean difference: Experimental - Control		
ASB (Olivier & Swart, 1988)		**Experimental**	**Control**	**Point estimate**	**95% Confidence Interval**	**P-Value**
ASB Test 4	**Pre** **Post**	1.76 2.30	1.79 1.62	-0.03 0.68	-0.49 to 0.44 0.13 to 1.23	0.91 *0.02
ASB Test 5	**Pre** **Post**	2.29 2.57	2.5 2.03	0.21 0.53	-0.74 to 0.32 0.05 to 1.01	0.44 *0.03
ASB Test 6	**Pre** **Post**	2.65 2.79	2.71 1.71	-0.06 1.07	-0.58 to 0.46 0.58 to1.55	0.81 *0.0001
ASB Test 8	**Pre** **Post**	1.26 2.79	1.61 1.71	-0.35 1.07	-0.72 to 0.03 0.54 to 1.62	*0.07 *0.0002

For the SRDA, the p-value was 0.726 when comparing the pre-and post-intervention scores, thereby indicating that although the SDRA scores did not show a statistically significant difference, the average totals still increased. The SRDA mean average of the experimental group pre-intervention to post-intervention increased from 57% to 68%. In addition, the SRDA mean average of the control group pre-intervention to post-intervention increased from 58% to 63%. However, although there was not a statistically significant difference between the mean scores, the perceptual-motor intervention programme still had a positive effect on the school readiness levels of the Grade R learners.

Thus the SRDA did not show statisically significant scores post-intervention, although the average mean scores per sub-test indicate that the following sub-tests almost tested statistically significant: Physical and gross motor development ($p<0.09$), and socio-emotional development ($p<0.06$). In terms of Mathematical and numerical ability, a statistically significant score of $p>0.03$ is however indicated, implying that the perceptual-motor intervention had a positive effect on these sub-tests, resulting in increased scores. Table 5.3 summarises the differences of average scores between

the experimental and control groups pre- and post-intervention in terms of specific sub-tests.

Table 5.3: Differences of average scores of experimental and control groups pre- and post-intervention on specific sub-tests of the SRDA

Test battery	Pre-Intervention/ Post-Intervention	School (Mean)		Mean difference: Intervention - Control		
SRDA (She or he)		**Experimental**	**Control**	**Point estimate**	**95% Confidence Interval**	**P-Value**
SRDA Test 1	**Pre** **Post**	65.24 78.82	70.28 71.34	-5.04 7.42	-14.41 to 4.33 -1.16 to 16.0	0.29 0.09
SRDA Test 4	**Pre** **Post**	49.92 65.51	51.40 59.05	-1.48 6.47	-8.58 to 5.61 -0.84 to 13.78	0.68 0.08
SRDA Test 7	**Pre** **Post**	42.95 55.59	46.13 45.33	-0.18 10.26	-14.60 to 8.25 -0.60 to 21.12	0.58 0.06

The implication of these results is that the perceptual-motor intervention programme had a positive effect on the individual developmental domains and perceptual-motor skills required for school readiness, that tested below average pre-intervention. As I specifically focused on these areas during the development of the intervention programme, the findings of this study indicate the potential value of the intervention or similar intervention programmes, specifically when involving Grade R learners from resource-constrained settings.

Social-emotional development, which tested below average pre-intervention was not a specific focus of the perceptual-motor intervention programme I developed; however, some of the activites required of learners to draw pictures of human beings, thereby implying human “contact”. I furthermore believe that the way in which activities were presented to the learners, focusing on an informal play-based approach, also resulted in learners having fun and getting the opportunity to interact and socialise with

classmates during the intervention programme, which could once again possibly have resulted in better social and emotional functioning.

In summary, the results I obtained thus indicate that the perceptual-motor intervention programme had a positive effect on the school readiness levels of Grade R learners from the selected resource-constrained context. In addition to the explanations provided above, the positive results could potentially also be linked to the Information Processing Theory (IPT) as I specifically included repetition of activities. In this regard, Louw and Louw (2014) state that when experiences are repeated, it becomes general memory, which can improve through continuous retrieval and rehearsal.

5.5 FINDINGS ON THE OUTCOME OF THE INTERVENTION

In this section, I discuss the outcomes of the intervention, based on my comparison of the pre- and post-intervention scores, in relation to the school readiness and perceptual-motor development of the Grade R participants. Results indicate that the Grade R learners were initially not ready for school; however, after implementation of the intervention, their school readiness levels increased. In order for me to highlight the relation between perceptual-motor development and school readiness, I discuss the findings on the outcome of the intervention in terms of the three learning areas that form part of the current Grade R curriculum; namely language, mathematics and life-skills - specifically with regard to physical development.

The NCS (DoE, 2011) provides critical outcomes that were derived from the Constitution and South African Qualifications Act (SAQA), and aims to produce learners who are able to solve problems, make decisions through critical and creative thinking, who can work effectively, who can collect, analyse, organise and effectively display responsibility towards the environment and others, and who have an understanding of the world. These outcomes can be reached when following an integrated approach to teaching the three primary learning areas, involving numeracy, literacy and life skills. In this regard, the current study indicates a lack of integration of the learning programmes as suggested by the curriculum (CAPS, 2011) when reviewing the pre-intervention results. Mainly, the focus was on the cognitive development of learners in the schools that participated when doing the pre-

intervention assessment, which included language and mathematics activities in the form of workbooks and whole-group activities. In this section, I foreground how the skills that learners displayed positively changed, following implementation of the intervention.

5.5.1 Increased language skills

The results of the pre-intervention assessment indicated below average scores on the Reasoning and Verbal comprehension sub-tests of the ASB, and on the Language, Cognitive thinking and Auditiory perception sub-tests of the SRDA. Several possible explanations can be given for thiese results, as mentioned by Wessels and Phatudi (2015), who emphasise the uniqueness of the South African context in terms of language. As stated earlier, although the DoE provides opportunities to learners to be educated in their home language, the majority of South African learners attend school in a language that is not their home language. This finding is confirmed by the Pan South Africa Language Board (PANSALB, 2000) who found that the majority of learners in South Africa are taught in a language that is not their home langauge.

One of the critical precursors of school readiness is literacy skills, which form part of the outcomes of the NCS (DoE, 2011). One of the key findings of the current study relates to language potentially limiting school readiness, even though language development forms a pivotal part of cognitive development. This finding concurs with the work of De Witt and Booysen (2007) who state that cognitive development implies the development of motor skills, perceptual memory and linguistic ability, and intelligence.

In terms of the outcome of the intervention programme I developed, the post-intervention quantitative results indicate an increase in the Reasoning and Verbal comprehension sub-tests (ASB) as well as the Language, Cognitive thinking and Auditory perception sub-tests (SRDA). More specifically, for ASB Sub-test 3 (Reasoning), the mean pre-test score of the experimental group was 2.1 and the post-test score was 2.5. Although not a statistically significant score, an increase in scores were thus evident. On ASB Sub-test 8 (Verbal reasoning), the mean pre-test score of the experimental group was 1.2 and the post-test score 2.79. For the control group,

the ASB Sub-test 3 (Reasoning) was 1.9 and post-test score 2.1. On Sub-test 8 (Verbal reasoning), the pre-test mean scores for the control group was 1.6 and the post-test score was 1.7. When comparing the average scores between the experimental and control groups pre- and post-intervention for Sub-test 8, a statistically significance post-test score of $p>0.0002$ applies, implying that the perceptual-motor intervention resulted in an increase in the scores of Sub-test 3 and Sub-test 8.

Similiary, scores obtained on the SRDA indicate an increase in Language, Cognitive thinking and Auditiory perception following the intervention. For Sub-test 6, the pre-test mean score for the experimental group was 48% and the post-test score was 56%. Although not a statistically significant difference, an increase in the scores was still evident. For the control group, the pre-test score for Sub-test 6 was 47% and the post-test score was 51%. Although the SRDA score did not show a statistically significantly higher average post-intervention between the experimental and control groups, an increase in the mean scores was still evident. As such, my study indicates that the intervention was successful for the promotion of language skills, even if minimal. The increase in scores concerning the Language, Cognitive thinking and Auditoy perception sub-tests can be linked to cognitive development, which in turn implies the possibility of improved school readiness.

5.5.2 Increased numerical abilities

Berk (2013), as well as McDevitt and Ormrod (2013), state that cognition emcompasses all mental activities that human beings engage in. Perception, categorisation, memory, logical reasoning and problem-solving are examples of these mental activities. Numeracy thus forms part of cognitive development. To this end, De Witt's (2009) criteria for cognitive readiness emphasise the importance of learners' mathematical readiness for formal schooling, which includes concepts and skills such as counting, recognition and copying of shapes, an understanding of the principle of cause and effect, basic addition and subtraction skills, knowledge on similiarities and differences, estimation, planning and evaluating, the understanding of symbols, and lastly the ability to solve problems. However, Isaacs (2010) states that learners from

resource-constrained settings are more likely to score low in mathematics, indicating a lower performance in terms of these criteria, than can be expected.

In the current study, a comparison of the pre- and post-test quantitative results on the ASB and SRDA indicates an improvement in terms of Numerical ability (Sub-test 4) on the ASB, and Mathematical and numerical abillity (Sub-test 4) on the SRDA. More specifically, for ASB sub-test 4 (Numerical) the mean pre-test score of the experimental group was 1.7 and the post-test score was 2.3. For the control group, the pre-test mean score was 1.7 and the post-test score was 1.6. When comparing the average scores of the experimental and control groups pre- and post-intervention for Sub-test 4, the results indicate a statistically significant post-test score of $p>0.02$.

Scores obtained on the SRDA similiary indicate an increase in Mathematical and numerical abillity (Sub-test 4). The pre-test mean score of the experimental group pre-test was 49%, while it was 65% for the post-test. Although not a statistically significant score, an increase in scores was thus evident. For the control group, the mean pre-test score was 51% and the post-test was 59%. Although the SRDA score did not show a statistically significantly higher average post-test between the experimental and control groups, an increase in the mean scores was evident.

The qualitative results I obtained indicate that few opportunities were apparently created for the Grade R learners to experience handling concrete objects. Mathematics lessons often entailed a situation where learners sat on the carpet, and listened to the teacher talking. Rote-counting was emphasised, rather than providing opportunities where learners could physically count concrete objects. In addition, mathematics worksheets or pages in the mathematics workbook provided by the DoE were often completed as part of lessons in this area (CAPS, 2011).

According to Piaget (1953), the handling of concrete objects whilst exploring and discovering, is important for the pre-conceptual phase of cognitive development. This usually occurs from two to seven years and entails a transition from understanding concreteness to understanding concepts based on symbols that occur. Symbolic understanding is necessary for learners to develop cognitively, and to become ready for formal schooling. Therefore, when learners are not afforded opportunities to

experience handling concrete objects, they may not be able to make the transition from concreteness to understanding symbols, which may pose challenges in understanding the concept of numbers. As such, the low scores the participants in the current study obtained in mathematics-related sub-tests may possibly be ascribed to limited stimulation and/or the methods used when being taught numerical skills.

Furthermore, the results I obtained may indicate that, in order for learners to develop critical skills for the ability to use and understand mathematics, they need to be provided with ample opportunities to explore, construct, identify and feel different shapes and objects. The perceptual-motor intervention programme was subsequently designed to provide learners with an increased number of concrete and multi-sensory activities, which may perhaps explain the scores in terms of mathematical and numerical ability obtained after the intervention.

5.5.3 Strengthened physical development

The learning area, life skills, according to the current Grade R curriculum (CAPS, 2011), consists of the following four learning dimensions: creative arts, beginning kowledge, personal and social wellbeing, and physical education. This subject is envisioned to be integrated into the daily Grade R programme in support of the holistic development of all learners. For the purpose of the current discussion, I focus on physical education only, due to perceptual-motor skills forming part of the intervention programme I developed, thereby implying physical development and not necessarily the other areas related to the life skills subject.

According to Van der Ven (2008), a child's physical skills will become more refined as development progresses. Physical movement opportunities can thus inevitably be linked to a child's attainment of important social and cognitive abilities. Physical development includes physical experiences and can be related to formal education skills such as reading, writing and numerical skills development. The findings of my study support those of Erasmus et al. (2016) who posit that, regardless of the importance of physical development and the fact that the Grade R curriculum makes provision for physical education, the promotion and stimulation of physical development, as well as movement and perceptual development of Grade R learners,

is not given much attention in schools. This tendency can in turn be linked to underqualified teachers, insufficient funding, and limited equipment and apparatus, which may result in overuse of formal worksheets or workbooks rather than focusing on physical, motor and perceptual discovery opportunities, as also indicated by the findings of this study.

Krog and Kruger (2011) state that limited motor development will have an effect on perceptual adequacy and conceptual development, such as body awareness; and that this may in turn affect learning. In this regard, I found that Body awareness (Sub-test 5 on the SRDA) was one of the perceptual areas in the physical development domain where learners performed below average pre-intervention. Poor body awareness can lead to difficulties in handwriting, pencil pressure and pencil grip. Awareness of the body is also fundamental for the development of coordination (Loubser, 2015). To indicate the performance of the Grade R participants, Tables 5.4 and 5.5 provide summaries of the ASB and SRDA raw scores pre- and post-intervention of the percentages of learners who tested below average in the physical development domain, and related perceptual areas.

Table 5.4: Percentages of learners who tested below average in the physical development domain and related perceptual areas pre-intervention

Physical develoment domain and perceptual skills	**Percentage of School A learners Pre-intervention (n=33)**	**Percentage of School B learners Pre-Intervention(n=25)**
Eye-hand coordination (SRDA)	54	24
Coordination (ASB)[36]	2.6	2.7
Body awareness (1) and draw a man test (2)[37] (SRDA)	24(1) 60 (2)	28(1) 76(2)

[36] Pre-intervention and post-intervention standard scores (norm scores) are obtained by converting the raw scores of the group to a standard scale – in this instance, a five-point scale which extends from 1 to 5 with an average of 3.The ASB raw scores are thus not indicated as percentages. A score under 3 indicates weak to very weak.

[37] Test 5 of the SDRA consist of two sub-tests namely Body awareness, which I indicated with (1), and Draw a man test, which I indicated with (2).

Table 5.5: Percentages of learners who tested below average in the physical development domain and related perceptual areas post-intervention

Physical develoment domain and perceptual skills	Percentage of learners post-intervention School A (n=29)	Percentage of learners post-intervention School B (n=23)
Eye-hand coordination (SDRA)	34	21
Coordination (ASB)	2.7	1.7
Body awareness (1) and draw a man test (2) (SRDA)	27 (1) 55 (2)	47(1) 48 (2)

The quantitative results I obtained on the ASB and SRDA therefore indicate that body awareness and fine motor coordination that form part of physical development, tested below average both pre- and post-intervention. As indicated in Tables 5.4 and 5.5, 54% of the learners from School A and 24% from School B scored below average on the eye-hand coordination test prior to the intervention. Post-intervention, 34% of the learners from School A (experimental group) scored below average, indicating an increase in the number of learners who tested average or above average. Concerning post-intervention, 21% of the learners from School B (control group) scored below average, indicating a small increase in the number of learners testing average and/or above average. These results imply that the experimental group who participated in the perceptual-motor intervention programme, showed improved functioning in this area, whereas the control group did not show significant improvement.

Similarly, the ASB pre-intervention average score for School A (experimental group) for the Coordination sub-test was 2.6, with a slight increase to 2.7 post-intervention. For the control group (School B), the pre-intervention average score was 2.7, which decreased to 1.7 post-intervention. Even though possible reasons for this requires further investigation, the scores obtained indicate an improvement in this area for the experimental group when compared to the control group.

Furthermore, as indicated in Tables 5.4 and 5.5, 24% of the learners from School A and 28% from School B scored below average on B*ody awareness,* and 60% of School A and 76% of School B learners scored below average on the Draw-a-man test pre-intervention. In support of these results, the qualitative data indicate that most

drawings were *"immature"* and did not developmentally match those of 6-year old children. Post-intervention, for School A (experimental group), 34% of the learners scored below average which indicates an increase in the number of learners who tested average or above average. For School B (control group), 21% of the learners scored below average post-intervention, which indicates a small increase in the number of learners who tested average or above average following the intervention. These results imply that the experimental group displayed a bigger improvement than the control group in developing the skills of eye-hand coordination and body awareness as part of the perceptual-motor intervention. Furthermore, 55% of School A's learners (experimental group) scored below average for the sub-test Draw-a-man, post-intervention, which implies an increase in the number of learners who tested average or above average after the intervention. For School B (control group), 48% of the learners scored below average post-intervention, also indicating an increase in the number of learners testing average or above average following the intervention.

These results possibly indicate a link between body awareness and the way in which children present drawings of human beings. As body awareness implies the ability to distinguish between different body parts, as well as an inner awareness of the body and the position and functioning of each of the body parts, Krog and Kruger (2011) state that this (body awareness) can be a precursor for learning, thereby confirming the results I obtained from both the quantitative and qualitative data sets. This may in turn explain the low school readiness scores obtained pre-intervention when compared to the increased levels depicted in post-intervention scores, following the perceptual-motor intervention.

Lastly, in a study conducted by Cameron et al. (2012), it was found that motor skills can predict vocabulary, auditory and visual skills. These authors emphasise the importance of motor development and fine motor skills as central to school readiness. As such, the findings I obtained indicate the positive effect of the perceptual-motor intervention on the school readiness levels of the participating Grade R learners, and support the findings of Cameron et al. (2012).

Emotional, social and moral upbringing are viewed as being part of the holistic development of learners, which impacts on school readiness. The results I obtained

indicate that the partipating Grade R teachers did not view these aspects as part of school readiness and did not make any mention of these. Despite literature (Barton et al. 2014; Pitcl & Provance, 2006; Salkind, 2008) indicating the importance of these aspects, the Grade R teachers who participated did not mention these and may consequently not have focused on these aspects when aiming to support the learners to become school ready. Further research is required to comprehensively investigate Grade R teachers' views of school readiness in terms of the importance of emotional and social development, amongst other areas of development.

In addition, moral-normative development froms part of the requirements for school-readiness (De Witt, 2009; Louw & Louw, 2007). Once again, the two Grade R teachers were silent about this part of learners' development. However, during my observations of classroom activites, learners were informed when their behaviour was right or wrong, or when their conduct was fair and just towards their peers. This was done when specific (often problematic) situations arose.

5.6 CONCLUSION

In this chapter, I interpreted the results I obtained in terms of existing literature. I highlighted areas where the findings of my study support existing literature, and indicated areas that contradict the literature I consulted. Throughout, I referred back to the results presented in Chapter 4, and the literature I explored in Chapter 2, in order to substantiate my findings and discussions.

In the final chapter of this thesis, I present an overview on the preceding chapters and draw conclusions when addressing the research questions that guided the current study. I foreground the contributions of my study, reflect on the conceptual framework I utilised, and note the limitations I identified and the challenges I experienced. I conclude the thesis by formulating recommendations for training practitioners, improving Grade R practice, and continuing further research.

CHAPTER SIX:

CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION AND OVERVIEW OF PRECEDING CHAPTERS

In the previous chapter, I discussed the findings of the current study. I related the results I obtained to existing literature, against the preceding chapters of the thesis, which I briefly refer to in the following paragraphs.

In Chapter 1, I introduced my study and provided contextual background. I explained the rationale of the study in terms of my personal interest and the need for ongoing research in the field of my selected topic. I situated my study in the broader context of school readiness and perceptual-motor development, and introduced school readiness in resource-constrained South African settings. Next, I formulated research questions, specified the aims of my research and clarified key concepts. Thereafter I briefly introduced the selected research methodology and strategies, and referred to the ethical considerations that guided me.

In Chapter 2, I explored existing literature based on the research I undertook. I discussed literature on early childhood development and the current scenario of early care and education in the South African context, more specifically focusing on Grade R learners and the potential value of structured enriching interventions. As background to the intervention programme, which I developed as part of this study, I unpacked the multi-faceted concept of school readiness, and the current South African Grade R curriculum. I concluded the chapter by explaining the conceptual framework I compiled based on my integration of the cognitive constructivist theory of Piaget, socio-constructivist theory of Vygotsky, information-processing theory and De Jager's model of cognitive development.

Chapter 3 commenced with a discussion of the pragmatist paradigm, mixed-methods approach and single-case experimental design I utilised. Next, I explained how I

collected, documented and analysed data. To this end, I presented the two school readiness tests I implemented pre- and post-intervention to assess the participating Grade R learners both before and after the intervention. In addition, I explained how I generated qualitative data through interviews and observations. I furthermore discussed the perceptual-motor intervention I developed, based on the data analysis I completed. I explained the validity and reliability of the quantitative instruments, and referred to quality criteria when conducting qualitative research. I concluded the chapter by explaining how I adhered to the ethical considerations throughout my study.

In Chapter 4, I focused on the quantitative and qualitative data that were generated. I provided the results based on the ASB and SDRA tests that were administered both pre- and post-intervention, in order to be able to determine the effect of the perceptual-motor intervention programme on the school readiness levels of the Grade R learners who participated. I included qualitative data in support of the quantitative results I presented. I highlighted differences identified between pre- and post-intervention scores, and between the scores of the experimental and control groups, in terms of statistically significant differences.

In Chapter 5, I connected the results I obtained to existing literature and portrayed the findings of the study. I reported on supporting and contradictive findings, as well as new insights stemming from this study. Following my discussions of the findings of my study, I come to conclusions in the current chapter. I relate the findings I obtained to the conceptual framework underlying my research in order to reach conclusions and address the research questions. I furthermore present the implications of the findings, and reflect on my study's limitations and challenges. I conclude the thesis with recommendations for training, practice and further research.

6.2 REFLECTION ON THE FINDINGS OF THE STUDY

In this section I reflect on the findings of my study in terms of the findings I anticipated and those that were revelations to me. Throughout the discussion I integrate and reflect on the conceptual framework that guided me in undertaking this research.

6.2.1 Findings that were anticipated

The intent of the perceptual-motor intervention programme I developed and implemented was to support and promote the school readiness levels of the Grade R learners who participated in my research. In addition to measuring school readiness with quantitative instruments prior to and following the intervention, I explored the two Grade R teachers' understanding of school readiness and perceptual-motor development, in order to supplement the quantitative data sets. The results from the QUAN data sets, both pre- and post-intervention, confirmed my expectations that the perceptual-motor intervention programme had a positive effect on the school readiness levels of the Grade R learners in the experimental group. The findings confirmed the extent of teachers' understanding of school readiness, and perceptual-motor development; the correlation between these two concepts similarly confirmed what I expected and was substantiated through the conceptual framework of the study.

Hence, during the development of the perceptual-motor intervention programme I paid attention to the stages of development according to Piaget's (1953) cognitive constructivist theory, as these are seen as the basis for developmentally appropriate perceptual-motor activities. I furthermore considered the existing theory related to the pre-conceptual phase of cognitive development as participating Grade R learners in this study found themselves to be in this phase, resulting in my emphasis on games and concrete activities for the intervention programme. I also attempted to anticipate the success of the perceptual-motor intervention programme in terms of core concepts of Vygotsky's (1978) socio-constructivist theory; more specifically the ZPD and scaffolding. Considering this, I expected that by utilising the ZPD and scaffolding, learners would be able and willing to build new knowledge with the assistance of the Grade R teacher who implemented the intervention with the experimental group.

I furthermore considered the information-processing theory when developing the intervention as I anticipated that learners would retain and be able to recall information when input to the brain is through their sensory modalities. In accordance with this theory, information-processing is regarded as essential for learners to become automated at basic skills such as perceptual-motor skills. I included activities that

would allow for acquiring automation of the skills necessary for Grade 1. These skills are writing, reading and number recognition.

Throughout the course of the study I also kept the natural maturation of children in mind, being conscious of the possibility that the results obtained post-intervention could have shown an improvement based on natural maturation instead of being a direct outcome of the intervention. However, the time that lapsed between the school readiness tests that were conducted pre-intervention and those done post-intervention was less than three months. I thus postulate that the improved levels of school readiness and certain perceptual-motor skills was primarily the result of the perceptual-motor intervention programme, more specifically due to the way it was developed and implemented.

6.2.2 Findings that surprised me

The qualitative results I obtained led to surprising findings. First, the findings on teachers' understanding of school readiness points to limited knowledge of the teachers in terms of the importance of emotional, social and moral development forming part of school readiness. Even though emotional, social and moral development all form part of the holistic development of children during the preparation phase for school readiness, these domains were not mentioned by the teachers. The question arises as to how clearly this concept is understood by teachers in the profession, which in turn has implications for the focus and teaching strategies applied with Grade R learners. Further research is however required to investigate additional Grade R teachers' views of school readiness and the role of emotional and social readiness in preparing learners for formal schooling before coming to conclusions.

As stated, the two Grade R teachers were similarly silent about the importance of moral development during Grade R. However, during my observations, unacceptable behaviour of children were dealt with only as specific incidences and not as a general focus throughout teaching activities. Moral development is however seen as an important aspect of cognitive development and the implied way children learn to think about their actions and experiences, lead to the conclusion that it is important to provide opportunities for social, emotional and moral development in the daily Grade

R programme. In this regard, the Life Skills (LS) subject is designed to support learners' personal development and social wellbeing, which includes aspects of emotional, social and moral develoment. Even though Life Skills is a part of the national Grade R curriculum, in the participating schools, it is however not being offered as a subject that could raise the potential of each child.

Despite this limited understanding of, and narrow view on school readiness, I found the teacher participants' enthusiasm towards the intervention programme and their need for assistance and guidance to be positive. However, contrary to this observation, the finding that several resources were available (although some of them were old and tattered) but teacher participants did not have a clear understanding of how to utilise these optimally, further puzzles me. For example, I was surprised that, even though the teachers possess book resources provided by the DBE, where all learning programmes are pre-designed and only needs implementation, the participating teachers mostly focused on numeracy and literacy activities during class time. I was also surprised by the way in which assessment was conducted, recording of "marks" was done, and the views of the HODs regarding the teaching and learning approach to be followed in Grade R classrooms. In this regard, I anticipated that as senior personnel, they (HODs) would have a better understanding of the holistic development of learners and not only focus on cognitive (language and mathematics) development. It follows that these findings therefore require follow-up research in order to gain more clarity on the trends I observed.

6.3 CONCLUSIONS

The primary research question that guided me in undertaking this study was formulated as follows: *How can the school readiness of Grade R learners in a public school in a resource-constrained area be supported (or not) by a perceptual-motor skills intervention enriching the Grade R curriculum?* In order to address the primary research question, I reach conclusions in terms of the formulated secondary questions in this section. Following these discussions, conclusions are formulated in terms of the primary question.

6.3.1 Secondary research question 1: How do the levels of school readiness of Grade R learners from a public primary school compare before and following implementation of a perceptual-motor intervention programme?

Before implementation of the perceptual-motor intervention programme, the school readiness levels of the participants in the experimental group tested below average on the ASB test and just above average (50%) on the SRDA. Although the SRDA indicated that learners were ready for school pre-intervention when considering the total score, most of the perceptual-motor skills required for school readiness tested below average. Specifically, the skills of eye-hand coordination, mathematical concepts, number concept, number names, symbols, visual integration, visual closure, visual analysis and synthesis, visual integration, auditory memory, auditory analysis and synthesis, auditory closure, auditory associations and classification, listening skills and spatial orientation, were not developed optimally.

Following the intervention programme which focused on the promotion of these perceptual-motor domains that initially tested below average, the two school readiness tests were administered post-intervention. Results indicated a difference in school readiness scores when compared to the pre-intervention scores that were obtained. The ASB showed a statistically significant result indicating that the perceptual-motor intervention programme had a positive effect on the school- readiness levels of the participating Grade R learners (experimental group). The SRDA similarly indicated an improvement in terms of general school readiness, even though not statistically significant.

Based on the findings of this study I can thus conclude that the perceptual-motor intervention programme had a positive effect on the levels of school readiness of the participating Grade R learners in the experimental group. As the content and implementation of the intervention programme was in line with assumptions of the child development theory, I maintain that the stimulation of developmentally appropriate skills in young learners, informed by theory, will have positive outcomes. Thus, in my study, the learners' engagement in the perceptual-motor intervention reflected the notion of learning through play, exploring and discovering through the senses in order to build new knowledge.

Throughout the implementation of the intervention programme I relied on the concepts of scaffolding and ZPD. I also ensured that information was provided to the brain through sensory modalities and kept in mind that learners could learn more easily when first handling concrete objects and making use of their senses to explore and build new knowledge. The intervention specifically focused on the perceptual-motor skills that were not optimally developed pre-intervention. By implementing the intervention programme in this manner, an improvement of school readiness scores occurred post-intervention.

6.3.2 Secondary research question 2: How do Grade R teachers view perceptual-motor skills and the importance of these skills for the school readiness of learners?

A comprehensive overview of existing literature on perceptual-motor development and its relation to school readiness was provided in Chapter 2, foregrounding existing literature on early childhood development and the current scenario of early-care and education in the South African context. In addition, I explored the multi-faceted concept of school readiness, and the current South African Grade R curriculum as background to the intervention programme I developed.

The findings I obtained revealed that the two participating teachers held a narrow view of school readiness (focusing mainly on cognitive development). They had a poor understanding of what perceptual-motor development entails – at first indicating that they did not know what this was, yet displaying some insight after explanations by me. Concerning this, I thus conclude that tentative explanations of these concepts and the relation between them can lead to teachers gaining insight of what perceptual-motor skills involve; which in turn may have positive outcomes for classroom practice. In this regard, I assert that if more emphasis is placed on training programmes specifically pertaining the understanding of the value of perceptual-motor development by following an informal approach when teaching Grade R learners, more opportunities may be created for learners to acquire the skills necessary for academic success when entering Grade 1. This possibility however requires further research before reaching final conclusions.

Based on my findings, I can contemplate that little or no emphasis was probably placed on perceptual-motor activities during the daily programme in the classes when my study commenced as the teachers' limited knowledge and lack of understanding on the importance of stimulation in the various developmental domains, may have hindered learning. Both the participating Grade R teachers followed lesson plans that were pre-designed by the DBE and provided to them in a book format (CAPS, 2011). Although perceptual-motor activities are included in the daily programme, through the subject of Life Skills, teachers claimed that there was not much time to do these as they had to complete the activities in the workbooks (CAPS, 2011). As a result, the main focus fell on language and mathematics activities.

6.3.3 Secondary question 3: Which classroom and playground-based resources can potentially support perceptual-motor development?

In exploring which classroom and playground-based resources were available and could potentially support perceptual-motor development, I obtained data through observations, field notes and photographs. I realised that resources were available in both schools, even though these were limited and often outdated. In addition, it was evident that some of these resources were not optimally used in preparing Grade R learners for formal schooling. Outdoor resources at both participating schools mainly consisted of swings, jungle-gyms, and sandpits with insufficient sand. No paved areas existed that could be utilised to paint; for example, hop-scotch designs, curved and straight lines or outlines for balancing activities. Very little grass grew on the play grounds at the time of my field work, resulting in not much available space where learners could sit down. I also noted that learners were not provided with apparatus to play with when outside (e.g. hula-hoops, skipping ropes, and balls). The sandpits were not utilised optimally as it required more sand. Toys such as buckets and spades for sand-play were also not available.

Indoor resources were available, but many were old and outdated. The resources I observed for fine motor development included pencils, crayons, paint brushes, scissors and glue. While these resources were utilised fully, other resources were kept in cupboards and not put out for learners to use. Both classrooms had posters which were displayed on the walls, and had desks and tables that were arranged in rows. A

carpet area was provided in both classrooms where learners apparently spent a lot of time on rote-counting and repeating what the teacher had said.

However, the availability of resources is important when preparing learners for school, especially when learners are taught in a second language. Even though a print-rich environment is pivotal in this instance, the posters displayed in the two classrooms were mostly faded and old, with some not suitable for a Grade R classroom. Also, a shortage of storybooks existed in both participating schools; however, both teachers mentioned that books and audio resources had been ordered and will soon be delivered.

Furthermore, I observed that the teachers for some reason did not know how to optimally utilise the resources that were available during teaching and learning activities. As such, I specifically designed the perceptual-motor intervention to utilise the resources that were available in the classrooms. During the development of the intervention programme, I made sure that activities focused on perceptual-motor skills that tested below average and that all activities moved from the concrete to semi-concrete. I designed activities that relied on available resources or resources made from waste material, such as boxes and plastic bags. For fine motor-skills activities, the available resources such as crayons, scissors, glue, paint and paint brushes were utilised. In this regard I posit that, due to the fact that teachers seemingly had difficulty in utilising resources optimally to prepare learners for school readiness, because of limited training or creative skills, the school readiness of the learners in their classes may have been hindered, and perceptual-motor skills may not have been developed optimally. However, further research is required in this area before coming to conclusions about this possibility.

Based on these findings, I furthermore postulate that, for optimal learning and teaching to take place, it is important that learners feel safe and comfortable in the learning environment and have access to stimulating learning environments. Teachers did however express the need for additional resources and both the participating teachers claimed that they had ordered resources that could support the learning experiences of the Grade R learners and assist them to become ready for formal school. Therefore, I argue that the lack of properly maintained and sufficient resources could possibly

have had a negative effect on the levels of school readiness and the development of perceptual-motor skills of the participating Grade R learners. This possibly requires further research.

6.3.4 Secondary question 4: What does a perceptual-motor enrichment intervention for Grade R learners entail?

The main purpose of the perceptual-motor intervention was to enrich the current Grade R curriculum, in order to support learners' levels of school readiness. As already stated, I designed the activities in such a way that available apparatus and resources could be used to achieve set goals. All activities were presented in groups and learners rotated until all had an opportunity to take part in the activity. Some activities took place outside the classroom, whilst others took place inside the classroom.

The perceptual-motor intervention programme (see Appendix E) was designed after the pre-intervention school readiness scores were obtained on the two school readiness instruments; namely, the ASB and SRDA. In addition to focusing on the skills requiring further development, I considered the concepts in my conceptual framework when developing and implementing the intervention. Thus, during the designing phase of the intervention programme I kept Piaget's (1953) pre-conceptual phase in mind. Similarly, I was guided by Vygotsky's (1978) social constructivist theory during implementation. Throughout I also paid attention to the theory of information-processing and De Jager's model of cognitive development.

According to Piaget (1953), children in the pre-conceptual phase require games and activities which can ultimately lead to more advanced levels of cognitive development that is necessary for formal schooling. As such, I specifically included concrete experiences and activities as part of the intervention, knowing how important they are for learners to build knowledge by handling concrete objects and exploring their senses. I also primarily followed a kinaesthetic approach which gradually moved to a more abstract or two-dimensional approach. I included activities and experiences that relate to all the various developmental domains, but focused more on the stimulation of perceptual-motor skills.

Before implementation of the intervention programme, I guided the one Grade R teacher (of the experimental group) in terms of her role of implementing the intervention. My reasons for involving her was that the learners knew her and were comfortable with her, and would as a result probably participate freely and gain learning experiences from the activities included in the intervention programme. During implementation the teacher encouraged learners to think for themselves. She made use of scaffolding in breaking down complex tasks and adjusting the level of assistance as children progressed. Furthermore, she continually considered learners' ZPDs in order to promote their school readiness.

In terms of the possibility of learners becoming automated in terms of basic perceptual-motor skills following the intervention, some of the activities were repeated to allow learners to construct their own knowledge and learning. Finally, I considered De Jager's model of cognitive development by attending to the explanation of how the brain is connected with the senses and how muscles form the basis of physical development.

As stated, the intervention programme focused on activities related to sensory-motor development taking into consideration which specific perceptual-motor skills are pivotal for academic success, and which skills tested below average on the ASB and SRDA pre-intervention. Thus, the following perceptual-motor skills were supported with the aim of strengthening them: spatial awareness and orientation (developed through gross motor movements, such as balance, posture, and correct sitting position); fine motor movements (which are important for skills such as pencil grip and turning the pages of a book); position in space (important for the positioning of letters); midline crossing (playing a pivotal role in being able to read and write from left to right); and directionality and laterality (crucial when starting to read and writing from the top to the bottom of the page and from left to right).

Temporal awareness (the inner and outer sense of time) was also integrated into the activities of the perceptual-motor intervention programmes as rhythm can support fluidity in speaking, writing and reading; and coordination is important in eye-hand coordination. Lastly, coordination and sensory awareness were integrated in terms of visual and auditory perception, and memory activities were relied on to teach children

how to remember letters, words and sentences that are seen and heard. Matching/discrimination activities supported learners in becoming able to recognise similarities and differences in letters and words, through sight and hearing; and visual closure activities focused on the skill of closing a letter or completing word activities.

6.3.5 Conclusions in terms of primary research question: How can the school readiness of Grade R learners in a public school in a resource-constrained area be supported (or not) by a perceptual-motor skills intervention enriching the Grade R curriculum?

The findings of the current study indicate that the perceptual-motor intervention programme had a positive effect on the school readiness levels of the participating Grade R learners. The intervention programme was designed in such a way that the learners could actively be involved and make use of their bodies and senses to complete activities and thus acquire knowledge and skills. The intervention was also designed to enrich the current Grade R curriculum, rather than to replace it, with the specific aim of increasing learners' levels of school readiness.

The conceptual framework I utilised confirms the alternative hypotheses I formulated in Chapter 3. Therefore, I conclude that the perceptual-motor intervention programme enriched the Grade R curriculum; and in so doing, supported Grade R learners' school readiness. The intervention was also embraced by both the Grade R teachers who indicated that they would appreciate any assistance to support the learners in their classes. In Figure 6.1, I highlight the areas in my conceptual framework initially presented in Chapter 2, which informed my explanation of the findings I obtained, as already captured in the previous subsections.

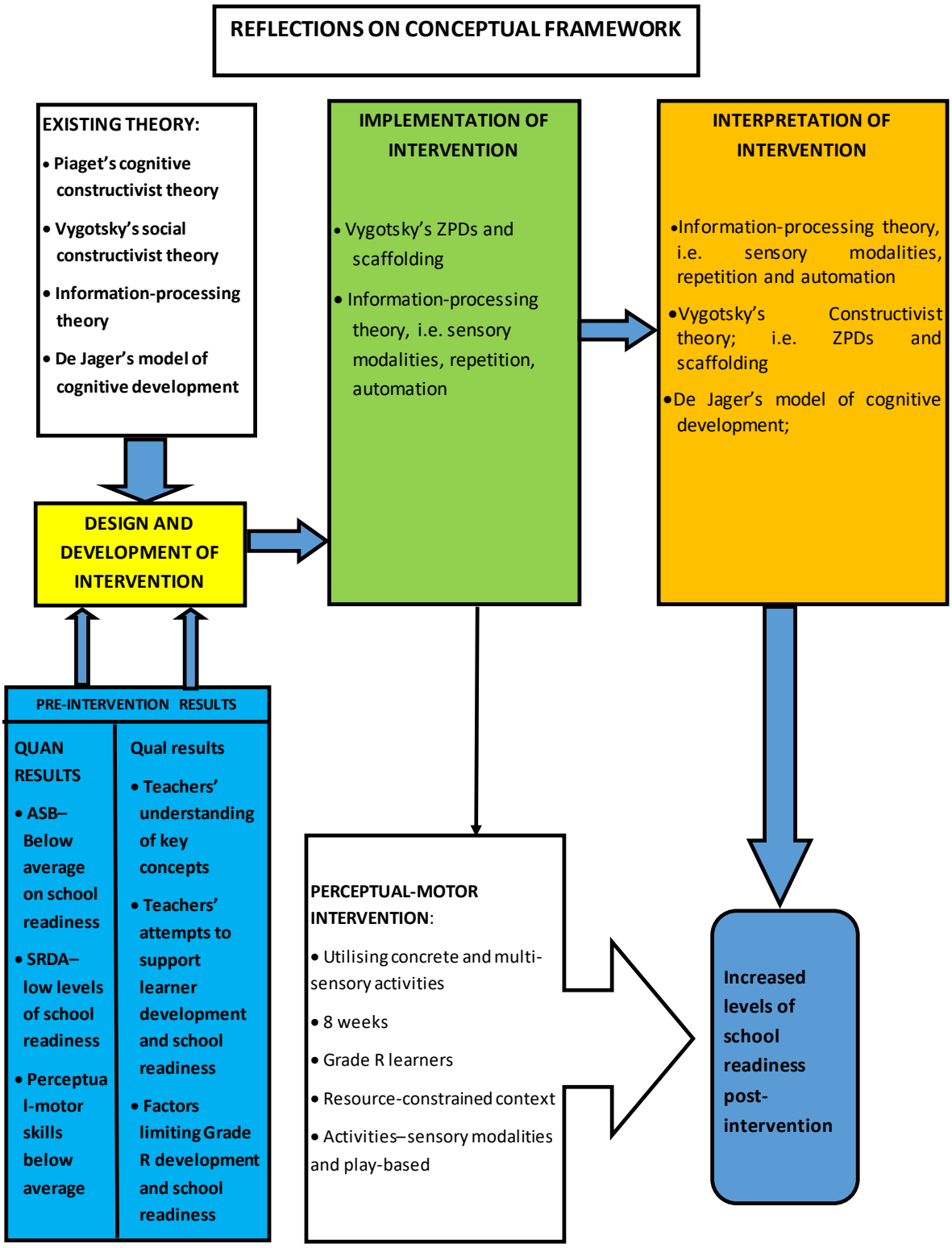


Figure 6.1 Reflections on the conceptual framework that guided the study

In conclusion, I was guided by Piaget's (1953) cognitive constructivism, Vygotsky's (1978) social constructivism, information-processing theory, and De Jager's model of

cognitive development in developing and implementing the perceptual-motor intervention programme. More specifically, I considered Piaget's (1953) views on how learners learn, think and remember, and that they can construct knowledge through direct engagement and active involvement in the learning process. As such, I considered the idea of learning being a result of experiences through senses and movement when developing the activities to include in the intervention. I therefore posit that the successful outcome of the intervention may be ascribed to the fact that Grade R learners find themselves to be in Piaget's (1953) pre-conceptual phase, thereby benefiting from learning based on activities, games and play-based tasks. This assertion emphasises the importance of concrete experiences in the Grade R year in order for children to build knowledge before moving on to more abstract reasoning and thinking.

During the implementation of the perceptual-motor intervention programme, I was guided by Vygotsky's socio-cultural constructive theory, more specifically attending to the ZPDs and scaffolding. The teacher who acted as facilitator of the intervention programme therefore aimed to support and assist the learners to make use of prior knowledge in building new knowledge, by breaking down complex tasks for them in order for learning to take place. Being guided by the underlying principles of the information processing theory, intervention activities relied on the learners' sensory modalities, as well as repetition of activities in order for the learners to become automated in the perceptual-motor skills they acquired, and then adapting information as needed. Based on the findings I obtained I can conclude that the theories I relied on in developing and implementing the intervention, and interpreting the results, contributed to the positive effect of the intervention as shown in the findings.

6.4 CONTRIBUTIONS OF THE STUDY

In discussing the rationale of my study in Chapter 1, I emphasised the importance of quality early-learning programmes for child development and future school success of learners in school. I indicated how factors such as low socio-economic status, lack of a resource-rich environment, delivery of low quality education and lack of parent involvement may influence a learner's school readiness.

Adding to existing knowledge in this field of interest, new insights gained from the current study add to literature on the development, implementation and value of perceptual-motor intervention programmes that enrich the Grade R curriculum and may support learners in getting ready for formal schooling. My study more specifically adds theory to research done in South African resource-constrained contexts, with potential application possibilities for related contexts. When teaching Grade R learners who come from backgrounds limited in stimulation and resources, teachers can benefit from examples of supportive interventions that can assist them in preparing learners for Grade 1.

Although a certain level of school readiness will promote academic success in later school years, factors such as limited stimulation for perceptual-motor skills development, limited resources at school, the quality of training and development of Grade R teachers, and supporting skills development through effective teaching, can limit the optimal development of Grade R learners. Consequently, the intervention I developed provides examples of activites that require limited resources and may be utilised beneficially by Grade R teachers in the profession.

Moreover, the contribution of my study does not only add to existing theory on school-readiness and how perceptual-motor skills development can support this, but also holds practical implementation value and relevancy for teachers working in resource-constrained contexts. If teachers, for example, encourage the physical development of Grade R learners, then their (learners) perceptual-motor development can be promoted as this forms the basis for mastering literacy and numeracy skills, and are important for reading, writing and mathematics. In addition, my study emphasises the importance of perceptual-motor skills in complementing gross and fine motor skills development – this is often seen as the basis of physical development. This finding, whilst preliminary, foregrounds the importance of perceptual-motor development, and advocates that greater emphasis be placed on this domain when scholars report on school readiness.

6.5 LIMITATIONS, CHALLENGES AND STRENGTHS OF THE STUDY

Data for this study were collected by eliciting information using a relatively small group of learners from a specific educational and socio-economic background. However, my intention was not to generalise the findings I obtained to the broader population as this is never the main purpose of a case study; however, transferability may be an option. A further limitation relates to the possibility of the qualitative data of the study not being sufficiently substantial due to the fact that I only interviewed two Grade R teachers pre-intervention. I could possibly have obtained richer data if I interviewed them again post-intervention or if I also interviewed the HODs or school principals. Upon reflection, I am also of the opinion that I could have probed more during the interviews as the data I obtained was not as descriptive as it potentially could have been. However, my aim was to support the pre-intervention results of the quantitative data – and that was achieved. Furthermore, by substantiating the quantitative data through, among others, follow-up interviews with the teachers and post-intervention, I may have provided richer data.

Another challenge I experienced relates to the limitations of visual data documentation strategies. My mobile telephone on which I captured the visual data during school visits, was unfortunately stolen, I thus had to return to the schools at a later stage to take additional photographs of the facilities and resources. Fortunately, I had compiled thorough/detailed field notes that I could rely on to substitute for lost visual data.

Another challenge concerns the aspect of post-intervention data collection which occurred at a time when both schools where busy preparing for the Grade R end-of-year functions. In School B, learners were told not to return to school after the end-of-year function, which led to an attrition in the numbers. However, in order to determine whether or not the learners with missing post-scores differed from the learners with available post-scores, the average pre-scores of the two groups of learners were compared using a two-way analysis of variance (ANOVA) with the factors *“School”* and *“Presence”* of the post-intervention data. The factor *‘Presence’* was found to be not statistically significant (P=0.6839), which suggested that there was no systematic difference between learners with and without post-scores, respectively.

The results of the SRDA, not indicating a statistically significant improvement in school readiness post-intervention, raises questions about the possible effect of the test not being standardised. However, the ASB which is a standardised test, indicated statistically significant differences, and on the various perceptual-motor development skills sub-tests of the SRDA, improvement could be seen. Based on these occurrences and the fact that the SRDA was specifically developed for the South African context and in alignment with the national curriculum, I regarded the SRDA as being suitable for the purpose of my study – to provide information in order to support the school readiness of Grade R learners through a perceptual-motor intervention.

Finally, the language in which the tests were administered, being Afrikaans (the LOLT of both schools) and not the first language of most of the learners, indicates another potential limitation. In order to prevent this factor from influencing the results, all instructions were explained carefully (and with extreme clarity) and learners were regularly asked whether or not they understood what was expected of them.

6.6 RECOMMENDATIONS

Based on the findings of my study, I make some recommendations for training, practice and future research in this section.

6.6.1 Recommendations for training

The perceptual-motor intervention programme I developed was utilised to enrich the current Grade R curriculum and improve the perceptual-motor skills required for formal schooling especially of the participating Grade R learners. Based on the conclusions I arrived at, I recommend that the development and implementation of perceptual-motor skills interventions form part of teacher-training programmes in order to prepare Grade R teachers for implementation in their classrooms. Training at undergraduate level can provide future teachers with an understanding of what perceptual-motor development entails and how this impacts on school readiness, and on how to plan and implement perceptual-motor skills development in daily Grade R programmes. Although perceptual development forms part of most teacher-training programmes, more focused training in this area may be beneficial for future teachers and the

learners they teach. In addition, practising teachers may benefit from refresher courses that focus on teaching strategies and methods for the holistic development of learners, which includes the promotion of perceptual-motor skills.

Furthermore, greater concentration on experiential learning techniques in undergraduate early-childhood and foundation-phase training programmes (more specifically in terms of hands-on learning or following a play-based approach) is recommended. Additionally, experiential and hands-on learning should be encouraged in all Grade R classrooms as this can benefit learners from various backgrounds with different preferences and needs. Practising teachers may in this regard similarly benefit from refresher courses or further professional development opportunities. A stronger focus is also recommended on the training of teachers who teach learners in a second language, considering the diversity of South Africa.

6.6.2 Recommendations for practice

The findings of my study may benefit various educational stakeholders. Firstly, I recommend that the findings of this study be practically applied in the participating schools where the study was undertaken. Even though both the experimental group (August-November 2016) and the control group (February-March 2017) underwent the intervention, I recommend that the teachers from the participating schools as well as teachers from neighbouring schools be informed of the findings, and become trained to implement the intervention with future Grade R groups based on the value of the intervention.

Based on the connection between school readiness and perceptual-motor development, I thus recommend that perceptual-motor skills stimulation and activities should form part of the daily Grade R programme in all classrooms, as it enriches the curriculum and supports learners to become ready for school. This is not only relevant to learners from resource-constrained settings but for all learners across socio-economic contexts. To this end, all teachers may benefit from workshops introducing the intervention to them as examples of activities to implement in class. I also recommend that the training programme of Grade R teachers include a stronger practical component focusing largely on the play-based approach to teaching and

learning. This can assist in putting what is learned in theory into practice during training programmes.

Although the positive impact of the perceptual-motor intervention programme on the school readiness levels of Grade R learners from resource-constrained settings is demonstrated by the current study, the implementation of such an intervention on a broader level, however, depends on research-based policy development and implementation. While the findings of a small scale mixed-methods study may have limited impact on policymakers, I believe that this study highlights the role for policy concerning the importance of the Grade R year, especially in terms of the value of a play-based, child-directed approach; yet still focusing on emergent literacy, numeracy and life skills in optimally and holistically preparing learners for formal education. To this end, I encourage ongoing debate among researchers, professionals and policy developers on “de-schoolifying” the Grade R year.

Based on current trends in terms of South African learners’ achievements in reading and mathematics, it is necessary to put in place workable guidelines to promote learners’ holistic development in terms of school readiness, with a special focus on perceptual-motor development. This implies a need for researched-based policy making which can inform teacher-training in terms of pedagogy and teaching strategies. Closely related, I recommend that the current Grade R curriculum should include clear guidelines in terms of perceptual-motor skills development and required outcomes, as well as innovative assessment tools across the Grade R curriculum. Other identified areas such as the focus on languages and mathematics, and limited space and resources for perceptual-motor development at schools, also need to be addressed.

6.6.3 Recommendations for further research

A number of possible explanations leading to the findings and conclusions of my research are referred to in Chapter 5, leaving room for further research. Therefore, the following areas may be explored for follow-up studies:

- Additional exploratory research to investigate the extent of the effect of perceptual-motor intervention programmes focusing on concrete, multi-sensory

activities and learning experiences of learners from resource-constrained settings

- Comparative research on the extent to which the cultural and socio-economic backgrounds of Grade R learners and the contexts they function in may influence learning experiences and school readiness, more specifically in terms of perceptual-motor skills
- Exploratory research on the "de-schoolifying" of Grade R, moving more strongly towards a play-based, learner-initiated approach when preparing learners for formal education
- Similar exploratory research on auditory perception and its relation to school-readiness, with a special focus on second language learners, and how they can be supported in the Grade R year
- Follow-up research on the long-term effect of the developed perceptual-motor intervention programme on the school performance of the learners who participated
- Exploratory research on the relation between the utilisation of indoor and outdoor resources (including low-cost items) and school readiness of Grade R learners
- Descriptive studies on Grade R teachers' views of school readiness in terms of the role of emotional and social skills in preparing learners for formal schooling.

6.7 CONCLUSION

Understanding and supporting Grade R learners' development and preparation for formal schooling, specifically in contexts with limited resources, is vital in today's world. As learners are viewed as active participants in their own learning, this study highlights that Grade R teachers should be knowledgeable of the process of the holistic development of young children in terms of being able to optimally prepare the learners they teach for formal school. More specifically, teachers can implement play-based activities using limited resources to support the perceptual-motor skills development of Grade R learners, which will in turn have a positive effect on the learners' school readiness.

The findings of the current study thus indicate how a perceptual-motor intervention programme can support the levels of school readiness of Grade R learners from

resource-constrained areas. Considering the educational challenges encountered in resource-constrained contexts such as in many South African schools, this study highlights the importance of such focused efforts to support learners. The intervention I developed may serve as an example of a child-focused, needs-initiated and easy-to-implement tool that can be used by Grade R teachers to enrich the current Grade R curriculum, to upgrade school readiness levels and to develop a higher degree of perceptual-motor skills of learners; all of which are essential for academic success.

REFERENCES

Anderson, L., Shinn, C., Fullilove, M., Scrimshaw, S., Fielding, J., Normand, J. & Garande-Kulis, V. (2003). The effectiveness of early childhood development programs. A systematic review. *American Journal of Preventive Medicine, 24*(3), p. 15.

Arnett, J., & Maynard, A. (2013). *Child Development*. New York: Pearson.

Atmore, E., van Niekerk, L., & Ashley-Cooper. (2013). Early childhood education: The difference between policy and reality. *The Youth Dividend - Unlocking the potential of young South Africans (2012-2013)* www.ijr.org.za.

Atmore, E., van Niekerk, L., & Ashley-Cooper, M. (2012). *Challenges facing the early childhood development sector in South Africa* (pp. 53): National Development Agency.

Aubrey, K., & Riley, A., (2016). *Understanding and using educational theories*.London: SAGE.

Barton, E., Steed, E., Strain, P., Dunlap, G., Powell, D., & Payne, C. (2014). An Analysis of Classroom-Based and Parent-Focused Social–Emotional Programs for Young Children. *Infant and Young Children, 27*(1), p. 26.

Bazeley, P. (2004). Issues in Mixing qualitative and Qunatitative Approaches to Research. *1st International Conference- Qualitative Research in Marketing and Management*, pp. 1-11. Vienna.

Beard, R. (1969). *Piaget's Developmetal Psychology*. London: Routledge & Kegan Paul.

Bennet, J. (2012). *Early childhood education and care (ECEC) for children from disadvantaged backgrounds: Findings from a European literature review and two case studies*: European Commission - Directorate – General for Education and Culture.

Berk, L. (2001). *Development through the Lifespan* (2nd ed.). USA: Allyn & Bacon.

Berk, L. (2013). *Child Development* (9th ed.). New York: Pearsons.

Berry, L., Dawes, A., & Biersteker, L. (2013). Getting the basics right: An essential package of services and support for ECD. **In** L. Berry, L. Biersteker, A. Dawes,

L. Lake & C. Smith (Eds.), *South African Child Gauge 2013* pp. 26-33. Cape Town: Children's Institute.

Bierman, K., & Boivin, M. (2014). School readiness in a developmental perspective. In K. Bierman & M. Boivin (Eds.), *Promoting School Readiness and Early Learning*. New York: The Guilford Press.

Biersteker, L. (2010a). *How ready are our children for Grade R?* Paper presented at the Umalusi, CEPD & Wits Seminar: *Will Grade R really improve the quality of SA eduaction?* University of the Witwatersrand.

http://www.cepd.org.za/files/pictures/Final%20Report-April%202010%20CEPD%20Umalusi%20Seminar%20-%20Will%20Grade%20R%20really%20improve%20the%20quality%20of%20SA%20education.pdf.

Biersteker, L. (2010b). Scaling-up early child development in South Africa introducing a reception year (Grade R) for children aged five years as the first year of schooling. *Brookings Global Economy and Development*.

Biersteker, L. (2012). Early childhood development services: Increasing access to benefit the most vulnerable children: *South African Child Gauge.*Cape Town: Children's Institute.

Biesta, G. (2010). Pragmatism and the philosophical foundations of mixed methods research. **In** A. Tashakkori & C. Teddlie (Eds.), *Mixed Methods in Social and Behavioural Research* (2nd ed.). New York : SAGE.

Biesta, G., & Burbules, N. (2003). *Pragmatism and Educational Research.* New York: SAGE: Rowman & Littlefield Publishers.

Blaikie, N. (2003). *Analyzing Quantitative Data.* Thousand Oaks, California: Sage.

Botha, Y., Greeff, M., Mulaudzi, F. M., & Wright, S. C. D. (2010). *Research in Health Sciences*. Cape Town: Pearson.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qulitative research in psychology, 3*(2), pp. 77-101. Retrieved January 22, 2018, from https://doi.org/10.1191/1478088706qp063oa.

Bredekamp, S. (2011). *Effective practices in early childhood education*. New Jersey: Pearson.

Britto, P. (2012). *School Readiness: A conceptual framework*. New York: Education Section, Programme Division.UNICEF

Britto, P., Yoshikawa, H., & Boller, K. (2011). Quality of Early Childhood Development Programs in Global Contexts. Rationale for Investment, Conceptual Framework and Implications for Equity. *Sharing child and youth development knowledge, 25* (2), p. 31.

Bruce, T. (2010). *Early Childhood*. London: Sage Publishers.

Bryman, A. (2002). *Social Research Methods*. New York: Oxford.

Bulotsky-Shearer, R., Wen, X., Faria, A., Hahs-Vaughn, M., & Korfmacher, J. (2012). National Profiles of classroom quality and family involvement: A multilevel examination of proximal influences on Head Start children's school readiness. *Early Child Research Quartely, 27*(2012), p. 13.

Burchinal, M., Hyson, M., & Zaslow, M. (2008). Competencies and Credentials for Early Childhood Educators: What do we know and what do we need to know? *NHSA Dialog, 11*, 8. http://www.nhsa.org/files/static_page_files/9FFE3481-1D09-3519-ADDD70A596F4B2FF/Dialog_Briefs_v11no1.pdf.

Cameron, C., Brock, L., Murrah, W., Bell, L., Worzalla, S., Grissmer, D., & Morrison, F. (2012). Fine motor skills and executive function both contribute to kindergarten achievement. *Child Development, 83*(4), pp. 1229-1244.

Cappeloni, N. (2013). *Kindergarten Readiness*. California: Corwin.

Chambers, M., & Sugden, D. (2016). Intervention for young children displaying coordination disorders. *Journal of Early Childhood Research, 14*(2), pp. 115-131. doi:10.1177/1476718x14548780.

Charlesworth, R. (2008). *Understanding child development* (7th ed.). Canada: Thomson Delmar Learning.

Chowdhury, S. (2014). Ethical considerations in research with children. *Bangladesh Journal of Bioethics, 5*(1), 7.

Clasquin-Johnson, M.G., (2016). Now and then: Revisiting early childhood teachers' reactions to curriculum change. *South African Journal of Childhood Education.* 6(1), a408. http://dx.doi.org/10.4102/sajce.v6i.408.

Cohen, L., Manion, L., & Morrison, K. (2010). *Research methods in Education* (6th ed.). London: Routledge.

Cote, S., Geoffroy, M., & Pingault, J. (2014). Early child care and school readiness. In M. Boivin & K. Bierman (Eds.), *Promoting school readiness and early learning*. New York: The Guilford Press.

Creswell, J. (2005). *Educational Research. Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (2nd ed.). New York: Pearson.

Creswell, J. (2009). *Research Design* (3rd ed.). California: SAGE.

Creswell, J. (2010). Mapping the Developing Landscape of Mixed Methods research. **In** A. Tashakkori, & C. Teddlie (Eds.), *Mixed Methods in Social and Behavioral Research.* pp. 45-68. Thousand Oaks, California: SAGE.

Creswell, J. (2012). *Educational Reasearch. Planning, conducting, and evaluating qualitative and quantitatve research* (4th ed.). New York: Pearson.

Creswell, J. (2013). *Research Design. Qualitative, Quantitatve and Mixed Methods Approaches* (3rd ed.). New York: SAGE.

Creswell, J. (2015). *A Concise Introduction to Mixed Methods Research.* New York: SAGE.

Creswell, J., & Plano Clark, V. (2007). *Designing and Conducting Mixed Methods Research*. California: Sage Publications, Inc.

Crosnoe, R., Leventhal, T., Wirth, R. J., Pierce, K., & Pianta, R. C. (2010). Family Socioeconomic Status and Consistent Environmental Stimulation in Early Childhood. *Child Development, 81*(3), p. 16.

Davin, R., & Van Staden, C. (2005). *The Reception Year. Learning through Play* (2nd ed.). Johannesburg: Heinemann Publishers.

De Jager, M. (2009). *Mind Moves; moves that mend the mind*. Johannesburg: Mind Moves Institute.

De Jager, M. (2012). *Grade R a year full of Clever Play. Mind Moves. R*etrieved 15 August 2014 https://www.mindmoves.co.za/articles/article/GradeRaYearFullOFCleverPlay_MelodieDejagerNEW.pdf.

De Jager, M. (2014). T*he Importance of Sensory-based Learning in the Classroom.* https://www.mindmoves.co.za/articles/article/TheImportanceOfSensoryBasedLearningInClassroom_DrMelodieDeJager.pdf.

De Witt, M. W. (2009). *The Young Child in Context. A thematic approach*. Pretoria: Van Schaik Publishers.

De Witt, M. W. (2016). *The Young Child in Context. A thematic approach (2nd ed.)*. Pretoria: Van Schaik Publishers.

De Witt, M. W., & Booysen, M. I. (2007). *Focusing on the Small Child. Insights from Psychology of Education*. Cape Town: Acasia.

Dednam, A. (2005). Learning impairment. In E. Landsberg (Ed.), *Addressing Barriers to Learning. A South African Perspective*. Pretoria: Van Schaik Publishers.

Department of Education (2001). *Education White Paper 5 on Early Childhood. Pretoria: Department of Education*

Department of Education (2011). *National Curriculum Statement: Curriculum and Assessment Policy Statement*. Pretoria: Department of Education.

Department of Education (2011a). *Action Plan to 2014. Towards the Realisation of Schooling 2025*. Pretoria: Department of Education.

Department of Education (2011b). *Universal Access to Grade R. Policy Framework*. Pretoria: Retrieved from www.thutong.DoE.gov.za/ResourceDownload.aspx?id=47575.

Department of Education. (2011). *National Curriculum and Assessment Policy Statement for Life Skills- Foundation Phase*. Pretoria: Department of Education.

Department of Education (2014). *Education for all*. Pretoria: Department of Education: Retrieved from http://www.education.gov.za/LinkClick.aspx?fileticket=m%2B%2F6vJCM%2FhU%3D&tabid=358&mid=1261.

Du Plooy-Cilliers, F., & Cronje, F. (2014). Quantitative data collection. **In** F. du Plooy-Celliers, C. Davis & R. Bezuidenhout (Eds.), *Research Matters*. Cape Town: Juta.

Doherty, J., & Hughes, M. (2014). *Child Development. Theory and Practise* (2nd ed.). United Kingdom: Pearson.

Dudovski, J. (2017). *Purpose Sampling*. Retrieved January 20, 2018, from Research methodology: https://research-methodology.net/sampling-in-primary-data-collection/purposive-sampling/.

Dugmore, H. (2014). *A is for Apple, R is for Results*. Retrieved 1 March 2014, from http://www.wits.ac.za/alumni/news/features/12724/.

Durrheim, K. (2006a). Basic quantitative analysis. In M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practise* (9th ed.). Cape Town: University of Cape Town Press.

Durrheim, K. (2006b). Research Design. **In** M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practise*. Cape Town: University of Cape Town Press.

Durrheim, K., & Painter, D. (2006). Collecting quantitative data: sampling and measuring. **In** M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practise* (2nd ed.). Cape Town: UCT Press.

Ebrahim, H. (2010). Tracing historical shifts in early care and education in South Africa. *Journal for Education, 48*, p. 17.

Erasmus, M. (2012). *Riglyne vir n perseptueel-motoriese intervensie program om die leergereedheid van Graad R leerders te bevorder.* (Philosophiae Doctor), North-West University.

Erasmus, M., Janse van Rensburg, O., Pienaar, A., & Ellis, S. (2011). Deficiencies within the education system with regard to perceptual-motor learning preparation of Grade R learners. *South African Journal of Childhood Education, 1*(2), pp. 46-63.

Erasmus, M., Janse van Rensburg, O., Pienaar, A., & Ellis, S. (2016). The effect of a perceptual-motor intervention programme on learning readiness of Grade R learners from South Africa deprived environments. *Early Child Development and Care, 186*(4), pp. 596-611. doi:10.1080/03004430.2015.1048245.

Erikson, E. (1963). *Childhood and Society* (2nd ed.). New York: Norton.

Excell, L., & Linington, V. (2011). Taking the debate into action: Does the current Grade R practice in South Africa meet quality requirements? *SA-eDUC JOURNAL, 8*(2), p. 10.

Excell, L., Linington, V., & Sethusha, J. (2015). What is Grade R? **In** L. Excell & V. Linington (Eds.), *Teaching Grade R*. Cape Town: Juta and Company (Pty) Ltd.

Excell, L., Linington, V., & Schaik, N. (2015). Perspectives on early childhood eduaction. **In** L. Excell & V. Linington (Eds.), *Teaching Grade R*. Cape Town: Juta and Company (Pty) Ltd.

Excell, L., & Linington, V. (2015). An optimal learning environment. **In** L. Excell, & V. Linington (Eds.), *Teaching Grade R.* pp. 102-128. Cape Town: Juta.

Fancher, E. (2010).*Comparison of methods of analysis of pretest and posttest data.* (Doctoral thesis) Retrieved 20 March 2014 https://getd.libs.uga.edu/pdfs/fancher_emily_l_201308_ms.pdf

Feilzer, M. (2010). Doing Mixed Methods Research Pragmatically: Implications for the Rediscovery of Pragmatism as a Reasearch Paradigm

Journal of Mixed Method Research, 4, 12. doi: 10.1177/1558689809349691.

Frazeur Cross, A., & Conn-Powers, M. (2011). A Working Paper: New Information about School Readiness. Retrieved 20 March 2014 http://www.iidc.indiana.edu/styles/iidc/defiles/ECC/WorkingPaperReadiness.pdf.

Gabbard, C., & Rodriques, L. (2013). *Early Childhood News: Optimizing Early Brain and Motor development through Movement*. Retrieved 23 Augusst 2013, from http://www.earlychildhoodnews.com/earlychildhood/article.

Gallahue, D., Ozmun, J., & Goodway, J. (2012). *Understanding Motor Development: Infants, Children, Adolescents, Adults* (7th ed.). USA: McGraw-Hill Higher Education.

Gallehue, D., & Ozmun, J. (2006). *Understanding Motor Development: Infant, Children, Adolescent, Adults* (6th ed.). New York: McGraw- Hill.

Gale, N. K., Heath, G., Cameron, E., Rashid, S., & Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC medical research methodology, 13*(1), p. 117.

Goddard-Blythe, S. (2011). *The Right to Move: Assessing Neuro-Motor Readiness for Learning.* http://www.ecswe.net/wp-content/uploads/2012/01/QOC3-Chapter-1.pdf. Gordon.

Hall, K., & Sambu, W. (2014). *Income poverty, unemployment and social grants.* S. Mathews, L. Jamieson & C. Smith (Eds.), *South African Child Gauge 2014* Retrieved from www.ci.org.za.

Halle, T., Hair, E., Wandner, L., & Chien, N. (2012). Profiles of school readiness among four-year-old Head Start children. *Early Childhood Research Quarterly, 27*(2012), p. 15.

High, P. C. (2008). School Readiness. *Pediatrics*. Retrieved from American Academy of Pediatrics website: doi:10.1542/peds.2008-0079.

Human-Vogel, S. (2004). Cognition and learning. In I. Eloff & L. Ebersöhn (Eds.), *Keys to Educational Psychology*. Cape Town: UCT Press.

Isaacs, J. (2012). *Starting School at a Disadvantage: The School Readiness of Poor Children.* pp. 22: Brookings Institution.

Ivankova, N., Creswell, J., & Plano Clark, V. (2010). Foundations and approaches to mixed method research. In K. Maree (Ed.), *First Steps in Research* (5th ed.). Pretoria: Van Schaik Publishers.

Ivankova, I., Creswell, J., & Stick, S. (2006). Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice. *Field Methods*, pp. 3-18. doi:10.1177/1525822X05282260.

Janse van Rensburg, O. (2015). The school readiness performance of a group of Grade R learners in primary schools in the Gauteng Province of South Africa. *South African Journal of Childhood Education, 5*(1), 106-124. Retrieved April 7, 2017.

Jansen, J. (2010). The language of research. **In** K. Maree (Ed.), *First Steps in Research* (5th ed.). Pretoria: Van Schaik Publishers.

Jansen, J. (2014, January 29). *Failure breeds "sucess" in SA schools,* Sunday Times, p.4.

Kail, R. (2012). *Children and their Development.* 6th Ed. Boston: Pearson

Kelly, K. (2006a). Calling it a day: Reaching conclusions in qualitative research. **In** M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practise* (2nd ed.). Cape Town: UCT Press.

Kelly, K. (2006b). From encounter to text: collecting data in qualitatitve research. **In** In M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practise*. Cape Town: University of Cape Town Press.

Kohlberg, L. (1975). The cognitive approach to moral development. *Phi Delta Kappan*, 670-677. Retrieved February 1, 2018, from http://www.jstor.org/action/doBasicSearch?Query=The+cognitive+approach+to+moral+development&acc=off&wc=on&fc=off&group=none.

Koonin, M. (2014).Validity and realiability. **In** F. du Plooy-Celliers, C. Davis & R. Bezuidenhout (Eds.), *Research Matters*. Cape Town: Juta.

Krog, S., & Kruger, D. (2011). Movement Programmes as a means to Learning Readiness. *South African Journal for Research in Sport, Physical Education and Recreation, 33*(3), pp. 73-87.

Kruger, C., & Wessels, E. (2015). Early concept development in mathematics/numeracy. **In** L. Excell, & V. Linington (Eds.), *Teaching Grade R* pp. 250-287. Cape Town: Juta.

Langston, A., & Abbot, L. (2010). *Birth to Three*. **In** T. Bruce (Ed.), Early Chilhood (2nd ed., pp. 430. London: SAGE Publications.

Lindegger, G. (2006). Research methods in clinical research. **In** M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practise* (2nd ed.). Cape Town: UCT Press.

Linder, S., Ramey, D., & Zambak, S. (2013). *Predictors of School Readiness in Literacy and Mathematics: A Selective Review of the Literature. 15*(1), p. 11.

Linington, V. & Excell, L. (2011) Taking the deabte into action: Does the current Grade R practice in South Africa meet quality requirements? *SA-eDUC JOURNAL,* 8(2), pp. 3-12.

Loubser, A. (2015). Knowing the Grade R child. **In** L. Excell & V. Linington (Eds.), *Teaching Grade R.* Cape Town: Juta and Company (Pty) Ltd.

Louw, M. (2014). Ethics in Research. **In** F. Du Plooy-Celliers, C. Davis, & R. Bezuidenhoudt (Eds.), *Research Matters.* pp. 262-273. Cape Town: Juta.

Louw, D., & Louw, A. (2007). *Child and Adolescent Development*. Bloemfontein: Psychology Publishers.

Louw, D., & Louw, A. (2014). *Child and Adolescent Development*. 2nd Ed. Bloemfontein: Psychology Publishers.

Maree, K. (2004). Theoretical Approaches in Psychology. **In** I. Eloff & L. Ebersöhn (Eds.), *Keys to Educational Psychology*. Cape Town: UCT Press.

Maree, K., & Pietersen, J. (2010a). The Quantitative Research Process. **In** K. Maree (Ed.), *First Steps in Research* (5th ed.). Pretoria: Van Schaik Publishers.

Maree, K., & Pietersen, J. (2010b). Sampling. **In** K. Maree (Ed.), *First Steps in Research* (5th ed.). Pretoria: Van Schaik Publishers.

Mc Devitt, T., & Ormrod, J. (2013). *Child Development and Education*. United States of America: Pearson.

McGettigan, I., & Gray, C. (2012). Perspectives on School Readiness in Rural Ireland: The Experiences of Parents and Children. *International Journal of Early Years Education, 20*(1), pp. 15-19.

Milligan, E., & Jones, J. (2016). *Rethinking Autonomy and Consent in Healthcare Ethics*. pp. 21-38. (P. Clark, Ed.) InTech. Retrieved January 24, 2018, from Eleanor Milligan and Jennifer Jones (2016). Rethinking Autonomy and Consent in Healthcare Ethics, Bioethics - Medical, Ethical and https://www.intechopen.com/books/b.

Mohamed, S. (2013). *The development of a school readiness screening instrument for Grade 00 (Pre-grade R) learners.* (PHILOSOPHIAE DOCTOR), University of the Free State. Retrieved from http://etd.uovs.ac.za/cgi-bin/ETD-browse/view_etd?URN=etd-07172013-161029.

Moletsane, M. (2012). Children and Childhood in South Africa. **In** J. Hardman (Ed.), *Child and Adolescent Development. A South African Socio-Cultural Perspective*. Cape Town: Oxford University Press.

Mooney, C. (2013). *Theories of Childhood. An Introduction to Dewey, Montessori, Erikson, Piaget and Vygotsky* (2nd ed.). USA: Redleaf Press.

Morgan, J. (2010). Frameworks for understanding development. **In** R. Parker-Rees, C. Leeson, J. Willan & J. Savage (Eds.), *Early childhood studies* (3rd ed.). Glasgow: Learning Matters Ltd.

Morgan, S.,Reichart, T., & Harrison, T. (2002). *From Numbers to Words.*USA: Allan & Bacon.

Morse, J. (1991). Approaches to Qualitative-Quantitative Methodological Triangulation. *Nursing Research, 40*(2), pp. 120-123. Retrieved January 19, 2018, from https://journals.lww.com/nursingresearchonline/Citation/1991/03000/Approaches_to_Qualitative_Quantitative.14.aspx.

Morse, J. (2015). Critical Analysis of Strategies for Determining Rigor in Qualitative Inquiry. *Qualitative Health Research*, 1212-1222. Retrieved January 24, 2018, from www.qhr.sagepub.com.

Mukherji, P., & Albon, D. (2010). *Research Methods in Early Childhood. An Introductory Guide*. London: SAGE.

Muthukrishna, N., & Govender, D. (2011). Moral Reasoning in The Early Years: Age And Gender Patterns Amongst Young Children In South Africa. *Gender and Behaviour, 9*(1), p. 18.

Nadin, S., & Cassell, C. (2006). The use of a research diary as a tool for reflexive practice. Some reflections from management research. *Qualitative research in Accounting and Management, 3*(3), p. 10.

Nairn, A., & Clark, B. (2012). Researching children: are we getting it right? *International Journal of Market Research*, 177-198. Retrieved January 24, 2018, from https://pdfs.semanticscholar.org/65f2/d68d1b5692f52a4c1a0e5f65e9a4cc8db11f.pdf.

Naude, M. (2016). How Foundation phase learners learn mathematics. **In** M. Naude, & C. Meier, *Teaching Foundation Phase Mathematics. A guide for South African students and teachers.* pp. 2-27. Pretoria: Van Schaik.

Neaum, S. (2013). *Child Development for Early Years Students and Practitioners*. London: Sage.

Neves, D. (2012). Poverty, adversity and resillience. In J. Hardman (Ed.), *Child and Adolescent Development. A South African Socio-cultural perspective* (1st ed.). Cape Town: Oxford.

Niewenhuis, J. (2010a). Analysing qualitative data. In K. Maree (Ed.), *First Steps in Research* (5th ed.). Pretoria: Van Schaik Publishers.

Niewenhuis, J. (2010b). Qualitative research designs and data gathering techniques. In K. Maree (Ed.), *First Steps in Research* (5th ed.). Pretoria: Van Schaik Publisher.

Nock, M., Michel, B., & Photos, V. (2007). *Single-case research designs.* http://www.sagepub.com/upm-data/19353_Chapter_22.pdf.

Noret, N. (2010). *Guidelines on Research Ethics for Projects with Children and Young People.* 5. http://www.yorksj.ac.uk/pdf/Guidelines%20in%20Research%20Ethics%20for%20Projects%20involving%20Children%20and%20Young%20People.pdf.

Olivier, N., & Swart, D. (1988). *Manual for the the Aptitude Test for School Beginners (ASB)*. Pretoria

Onwuegbuzie, A., Leech, N., & Collins, K. (2010). Innovative Data Collection Strategies in Qualitative Research. *The Qualitative Report, 15*(3), p. 31.

PANSALB. (2000). *Language use and language interaction in South Africa: A national sociolinguistic survey.* Pretoria: PANSALB.

Pascoe, G. (2014). Sampling. In F. Du Plooy-Celliers, C. Davis, & R. Bezuidenhoudt (Eds.), *Research Matters.* pp. 131-145. Cape Town: Juta.

Pekdoğan, S., & Akgül, E. (2017). Preschool Children's School Readiness. *International Educational Studies, 10*(1), pp. 144-153. Retrieved July 17, 2017, from http://dx.doi.org/10.5539/ies.v10n1p144.

Pellino K.M. 2006. *The effects of poverty on teaching and learning.* Retrieved November 22, 2017 from http://www.teach-nology.com

Phatudi, N. (2015). Introducing EFAL as a language of learning and teaching. **In** N. Phatudi (Ed.), *Introducing English as First Additional Language in the Early Years.* pp. 1-19. Cape Town: Pearson.

Piaget, J. (1953). *The Origin of Intelligence in the Child*. London: Routledge & Kegan Paul LTD.

Pienaar, A., Barhorst, R., & Twisk, J. (2014). Relationships between academic performance, SES school type and perceptual-motor skills in first grade South African learners: NW-CHILD study. *Child: care, health and development, 40*(3), pp. 370-378.

Pienaar, A., Van Rensburg, E., & Smit, A. (2011). Effect of a Kinderkinetics programme on components of children's perceptual-motor and cognitive functioning. *South African Journal for Research in Sport, Physical Education and Recreation,* 33(3), pp. 113-128.

Pietersen, J., & Maree, K. (2010a). Standardisation of a questionnaire. **In** K. Maree (Ed.), *First steps in Research* (5th ed.). Pretoria: Van Schaik Publishers.

Pietersen, J., & Maree, K. (2010b). Statistical analysis 1: Descriptive statistics. **In** K. Maree (Ed.), *First Steps in Research* (5th ed.). Pretoria: Van Schaik Publishers.

Pietersen, J., & Maree, K. (2010c). Statistical analysis II: Inferential statistics. **In** K. Maree (Ed.), *First Steps in Research* (5th ed.). Pretoria: Van Schaik Publishers.

Pitcl, J., & Provance, E. (*2006). Social and Emotional Well-Being: The Foundation for School Readiness*. Retrieved 30 September 2014, from www.wested.org/cpei.

Plano Clark, V., & Ivankova, N. (2016). *Mixed methods research. A guide to the field.* California: SAGE.

Powell, C., & Kalina, C. (2008). Cognitive and Social Constructivism: Developing Tools for an Effective Classroom. *Education, 130*(2), p. 11.

Prinsloo, M., & Reid, M. (2015). Experiences of parents regarding school readiness interventions for pre-school children facilitated by Community Health Nursing students. *International Journal of Africa Nursing Sciences*, pp. 94-101. Retrieved January 2015, 2018, from https://ac.els-cdn.com/S2214139115000256/1-s2.0-S2214139115000256-main.pdf?_tid=6f39e368-01c0-11e8-8505-00000aab0f6c&acdnat=1516878853_de1775052db546980d5f2590c0f04cce.

Ramey, C., & Ramey, S. (2006). Early Learning and School Readiness: Can Early Intervention Make a Difference? *Merill-Palmer Quarterly, 50*(4), p. 22.

Richter, L., Biersteker, L., Burns, J., Desmond, C., Feza, N., Harrison, D., Slemming, W. (2012). Di*agnostic Review of the Early Childhood Development Sector.* Retrieved 12 July 2014, from www.gov.za/documents/download.php?f=170644.

Rossi, J., & Stuart, A. (2007). The evaluation of an intervention programme for reception learners who experience barriers to learning and development. *South African Journal of Education, 27*(1), p. 16.

Rutgers, L. (2015). Guiding principles of the Grade R curriculum, teaching and learning. **In** Excell, L. & Linington, V. (2015) *Teaching Grade R.* Cape Town: Juta.

Salkind, N. (2008). *Encyclopedia of Educational Psychology* (K. Rasmussen Ed.). Washington: SAGE Publishers.

Salkind, N.J. (2008). *Statistics for people who (think they) hate statistics* (3rd ed.).Los Angeles: SAGE.

Schraw, G., & McCrudden, M. (2013). *Information Processing Theory.* Retrieved 16 July 2015, from http://www.education.com/reference/article/information-processing-theory/.

Schoen, L. (2011). *Sociocultural Theories of Motivation of learning: Looking back , looking forward.* **In** D. McInerney, G. Liem, R. Walker. California: Information Age Publishing

Seale, C. (1999). Quality in Quantitative Research. *Qualitative Inquiry, 5*(4), p. 14.

Sefotho, M. (2014). *A researcher's dilemma: Philosophy in crafting dissertations and theses.* p. 22.

Shenton, K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information, 22*, p. 14.

Sheridan, S. (2007). Dimensions of pedagogical quality in preschool. *International Journal of Early Years Education, 15*(22), p. 21. doi: 10.1080/09669760701289151.

Sherry, K., & Draper, C. (2012). The realtionship between gross motor skills and school readiness in early childhood: making the case in South Africa. *Early Child Development and Care*, 18. http://dx.doi.org/10.1080/03004430.2012.721358.

Spriggs, M. (2010). *Understanding Consent in Research Involving Children: The ethical Issues* (pp. 33). http://www.mcri.edu.au/projects/ConsentInResearch/.

Strydom, A., & Bezuidenhoudt, R. (2014). Qualitative data collection. *In Research Matters.* pp. 173-194. Cape Town: Juta.

StatsSA. (2015). *General Household Survey*. Pretoria: Retrieved from www.statssa.gov.za.

Teddlie, C., & Tashakkori, A. (2010). Major issues and controversies in the use of mixed methods in the behavioural and social sciences. **In** A. Tashakkori, & Teddlie, C. (Eds.), *Handbook on mixed methods in the behavioural and social sciences.* pp. 3-50. Thousand Oaks, CA: SAGE.

Terre Blanche, M., & Durrheim, K. (2006). Histories of the present: social science research in context. **In** M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practise* (2nd ed.). Cape Town: University of Cape Town Press.

Terre Blanche, M., Durrheim, K., & Kelly, K. (2006). First Steps in Qualitative Data Analysis **In** M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practise* (2nd ed.). Cape Town: University of Cape Town Press.

Terrell, S. (2012). M*ixed-Methods Research Methodologies.* http://www.nova.edu/ssss/QR/QR17-1/terrell.pdf.

Tredoux, C., & Smith, M. (2006). Evaluating research design. **In** M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practise* (2nd ed.). Cape Town: University of Cape Town Press.

Trochim, W. (2006). *Qualitative validity.* Retrieved 29 September 2014, from http://www.socialresearchmethods.net/kb/qualval.php.

Van den Heever, M. (2013). *'n Ondersoek na luistervaardighede en ouditiewe perseptuale vaardighede by Graad R leerders.* (Magister Educationis), University of North West (Potchefstroom).

Van der Berg, S., Girdwood, E., Shepherd, D., van Wyk, C., Kruger, J., Viljoen, J., Ezeobi, O., & Ntaka, P. (2013). The impact of the introduction of Grade R on learning outcome: *Final report (Policy Summary, Executive Summary and Evaluation Report) for the Department of Basic Education and the Department of Performance Monitoring ande Evalu*ation in the Presidency 17 June 2013, Research on socio-economic policy (ReSEP), Department of Economics, University of Stellenbosch, Stellenbosch.

Van der Berg, T. (2014). *[School Readiness Diagnostic Assessment].*Pretoria.

Van der Riet, M., & Durrheim, K. (2008). Putting design into practice. **In** M. Terre Blanche, K. Durrheim, & D. Painter (Eds.), *Research in Practice.* pp. 81-111. Cape Town: Cape town University Press.

Van der Ven, K. (2008). *Promoting Positive Development in Early Childhood -Building Blocks for a Successful Start.*

Van Zyl, E. (2004). The relation between perceptual development (as part of school readiness) and school success of Grade I learners. *Africa Education Review, 1*(1), p. 13.

Van Zyl, E. (2012). The relation between school readiness and school performance in Grade 1 and Grade 7. *SA-eDUC, 8*(2).

Vygotsky, L. S. (1962). *Thought and Language.* Cambridge: MIT Press.

Vygotsky, L. (1978). *Mind and Society*. Cambridge: Harvard University Press.

Weiten, W. (2016). *Psychology. Themes and Variations* (2nd ed.). (J. Hassim, Ed.) Hampshire: Marinda Louw.

Wessels, E., Phathudi, N. (2015). Language diversity: Teaching a second language in Grade R. In L. Excell & V. Linington (Eds)., *Teaching Grade R.* Cape Town: Juta and Company (Pty) Ltd.

Willes, B. (2014). T*he Advantages and Limitations of Single Case Study Analysis*. Retrieved from E-International website: http://www.e-ir.info/2014/07/05/the-advantages-and-limitations-of-single-case-study-analysis/.

Yeasmin, S., & Rahman, K. (2012). 'Triangulation' Research Method as the Tool of Social Science Research. *BUB Journal, 1*(1), pp. 154-163. Retrieved January 23, 2018.

Yin, R. K. (2013). *Case study research: Design and methods*: New York: Sage publications.

Zainal, Z. (2007). Case study as a research method. *Jurnal Kemanusiaan, 9*, 6.

Zhang, Y., & Wildemuth, B. (2008). *Qualitative Analysis of Content*. 12. https://www.ischool.utexas.edu/~yanz/Content_analysis.pdf.

APPENDICES

Appendix A: Permission to conduct research in selected primary schools in the Manguang Municipal District by the Free State Department of Education

Appendix B: Letters of informed consent and assent

Appendix C: Transcriptions of interviews

Appendix D: Field notes and research diary

Appendix E: Perceptual-motor intervention

Appendix F: Excerpt of visual data

APPENDIX A: Permission to conduct research in selected primary schools in the Manguang Municipal District by the Free State Department of Education

Enquiries: BM Kitching
Ref: Research Permission: IHarcourt
Tel. 051 404 9283 / 9221
Email: berthakitching@gmail.com and B.Kitching@edu.fs.gov.za

education
Department of Education
FREE STATE PROVINCE

Mrs I Harcourt
9 Navona
Chianti Drive
Lillyvale, 9301

083 661 7835

Dear Mrs Harcourt

APPROVAL TO CONDUCT RESEARCH IN THE FREE STATE DEPARTMENT OF EDUCATION

1. This letter serves as an acknowledgement of receipt of your request to conduct research in the Free State Department of Education.

   Research Topic: The effect of a perceptual-motor intervention on the school readiness of Grade R learners in a resource-constrained school setting.

2. Approval is herewith granted to conduct research in the Motheo District.
3. **Target Population:** 2 Educators and 80 Grade R learners, speaking Sotho / Afrikaans / English.
4. **Period of research:** For from the date of signature of this letter until December 2016. Please note the department does not allow any research to be conducted during the fourth term (quarter) of the academic year, however as this research involve Grade R learners, research may continue in the fourth academic quarter if necessary.
5. Should you fall behind your schedule by three months to complete your research project in the approved period, you will need to apply for an extension.
6. The approval is subject to the following conditions:
   - 6.1 The collection of data should not interfere with the normal tuition time or teaching process.
   - 6.2 A bound copy of the research document or a CD, should be submitted to the Free State Department of Education, Room 319, 3rd Floor, Old CNA Building, Charlotte Maxeke Street, Bloemfontein.
   - 6.3 You will be expected, on completion of your research study to make a presentation to the relevant stakeholders in the Department.
   - 6.4 The attached ethics documents must be adhered to in the discourse of your study in our department.
7. Please note that costs relating to all the conditions mentioned above are your own responsibility.

Yours sincerely

D EM SEKOLANYANE
CHIEF FINANCIAL OFFICER

DATE: 2016/06/17

APPENDIX B: Letters of informed consent and assent

18 July 2016

The School Principal

Dear Sir

REQUEST TO CONDUCT RESEARCH AT YOUR SCHOOL

I am currently busy with a doctoral study in Educational Psychology at the University of Pretoria on the following topic: "**The effect of a perceptual-motor intervention on the school readiness of Grade R learners in a resource-constrained school setting**". I hereby request permission to conduct my study at your school and to involve Grade R learners and Grade R teachers as participants.

For the purpose of my study I will involve two Grade R teachers in semi-structured interviews focusing on their views of perceptual-motor skills and the importance of these skills for the school readiness of learners. During the semi-structured interviews I will also focus on which classroom- and playground-based resources can potentially support perceptual-motor development. The interviews will last between 30 and 60 minutes and take place after school hours, on the school premises.

In addition to the Grade R teachers, I will involve 80 Grade R learners in data collection and a perceptual-motor intervention programme in support of their school readiness. Learners will be required to complete the School Readiness Diagnostic Assessment (SRDA) and the Aptitude Test for School Beginners (ASB) before the intervention programme is offered to them and again after completing the programme. One class of Grade R learners will form the experimental group while the other class will form a

control group. The intervention programme will be developed based on the outcome of the first round of school readiness tests, and implemented over a ten week period with the Grade R learners who form part of the experimental group. The relevant teacher will be requested to implement the intervention as part of the Grade R curriculum, while I (and possibly some fieldworkers) observe the learners and activities they take part in. After the second round of data collection the perceptual-motor intervention will be repeated with the control group in order to ensure that they benefit equally from the study.

All data I collect will be treated confidentially and no identifying information will be provided when reporting on the study. Data will be stored in a secure place at the University of Pretoria for fifteen years, in accordance with the requirements for conducting ethical research. Participants will have the right to withdraw at any stage, should they wish to do so, and they will not be exposed to any form of harm. In the case of any learner showing signs of distress the learner will be debriefed and then referred to an educational psychologist. No participant will be deceived in any way, and the purpose and process of the study will be explained to the Grade R learners, their parents and the Grade R teachers when obtaining informed consent.

The inputs received from your school can provide valuable information to report to the Free State Department of Education and relevant stakeholders following completion of the study. If you have any questions, please do not hesitate to contact either my supervisor or myself.

Thank you for your consideration of this request. I look forward to receiving your response.

Mrs Ina-Marie Harcourt (Researcher)
083 661 7835

Prof Ronel Ferreira (Supervisor)
Ronel.Ferreira@up.ac.za

REQUEST FOR PARTICIPATION AND INFORMED CONSENT

TEACHERS

I am currently busy with a doctoral study in Educational Psychology at the University of Pretoria on the following topic: "**The effect of a perceptual-motor intervention on the school readiness of Grade R learners in a resource-constrained school setting**".

In order for me to develop a perceptual-motor intervention programme and to establish the effect of the intervention on the levels of school readiness, I require input from Grade R learners as well as Grade R teachers. I would like to invite you to take part in my study. For this purpose you will be required to participate in a semi structured interview focusing on your views of perceptual-motor skills and the importance of these skills for the school readiness of learners. During the interviews I will furthermore focus on which classroom- and playground-based resources can potentially support perceptual-motor development. The interviews will last between 30 and 60 minutes and take place after school hours, at the school premises.

My study will also involve 80 Grade R learners in data collection and a perceptual-motor intervention programme in support of their school readiness. Learners will be required to complete the School Readiness Diagnostic Assessment (SRDA) and the Aptitude Test for School Beginners (ASB) before and after the intervention programme is offered to them and after completing the programme. The intervention programme will be developed based on the outcome of the first round of school readiness tests and the interviews conducted with Grade R teachers. Next, I will require of you to implement the intervention over a ten week period with the Grade R learners in your class (if they are the experimental group) or at a later stage (if they are the control

group) as part of the Grade R curriculum, while I (and possibly some fieldworkers) observe the learners and activities they take part in. I will provide the necessary training to you prior to implementation of the intervention programme.

All data I collect will be treated confidentially and no identifying information will be provided when reporting on the study. Data will be stored in a secure place at the University of Pretoria for fifteen years, in accordance with the requirements for conducting ethical research. You will have the right to withdraw at any stage, should you wish to do so, and you will not be exposed to any form of harm. You will also not be deceived in any way, and the purpose and process of the study is explained to you as part of this process of obtaining informed consent.

The inputs received from you can provide valuable information to report to the Free State Department of Education and relevant stakeholders following completion of the study. If you have any questions, please do not hesitate to contact either my supervisor or myself. If you are willing to participate in this research study, please complete the attached consent form.

Yours sincerely

Mrs Ina-Marie Harcourt (Researcher)
Ina-marie@vodamail.co.za
083 6617835

Prof. Ronel Ferreira (Supervisor)
Ronel.Ferreira@up.ac.za

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

INFORMED CONSENT FORM

TEACHERS:

Title of research project: **The effect of a perceptual-motor intervention on the school readiness of Grade R learners in a resource-constrained school setting**

I, _____ the undersigned,
in my capacity as Grade R teacher at

_____

(Name of school)

_____

(Address)

hereby agree to participation in the above-mentioned research study.

Signed at _____ on_____2016.

_____

_____

Researcher's signature

REQUEST FOR PARTICIPATION AND INFORMED CONSENT

PARENTS/CAREGIVERS

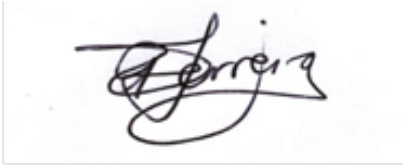
I am currently busy with a doctoral study in Educational Psychology at the University of Pretoria on the following topic: "**The effect of a perceptual-motor intervention on the school readiness of Grade R learners in a resource-constrained school setting**".

In order for me to develop a perceptual-motor intervention programme and to establish the effect of the intervention on school readiness I require the input from Grade R learners as well as Grade R teachers. My study will involve 80 Grade R learners in data collection procedures and a perceptual-motor intervention programme I subsequently develop in support of their school readiness. Learners will be required to complete the School Readiness Diagnostic Assessment (SRDA) and the Aptitude Test for School Beginners (ASB) on two occasions twice - before the intervention programme is offered to them and after completing the programme. One class of Grade R learners will form the experimental group while the other class will be the control group. The intervention programme will be developed based on the outcome of the first round of school readiness tests, and implemented over a ten week period with the Grade R learners who form part of the experimental group. The relevant Grade R teacher will be requested to implement the intervention as part of the Grade R curriculum, while I (and possibly some fieldworkers) observe the learners and activities they take part in. After the second round of data collection the perceptual-motor intervention programme will be repeated with the control group in order to ensure that they benefit equally from the study.

With this letter I request your permission to involve your child in the research project. All data I collect will be treated confidentially and no identifying information will be provided when reporting on the study. Data will be stored in a secure place at the University of Pretoria for fifteen years, in accordance with the requirements for conducting ethical research. Participants will have the right to withdraw at any stage, should they wish to do so, and they will not be exposed to any form of harm. In the case of any learner showing signs of distress the learner will be debriefed and then referred to an educational psychologist. No participant will be deceived in any way, and the purpose and process of the study will also be explained to the Grade R learners when obtaining informed assent from them.

The findings of this research can provide valuable information to report to the Gauteng Department of Education and relevant stakeholders following completion of the study. If you have any questions, please do not hesitate to contact either my supervisor or myself.

If you give permission that your child may participate in this research study, please complete the attached consent form. Thank you or your consideration of this request. I look forward to receiving your response.



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Faculty of Education
Fakulteit Opvoedkunde
Lefapha la Thuto

INFORMED CONSENT FORM
PARENTS/CAREGIVERS

Dear Ina-Marie

Please see my decisions below.

	YES	**NO**
My child may participate in the project		
You may take photographs of my child while he/she is involved in the perceptual-motor programme activities, without publishing hishe or her face at any stage		

Child's name and surname .....

Grade R class.....Home language.....

Parent/caregiver's signature.....

Date ……

Researcher's signature ……

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RESEARCH ASSENT FORM

Good morning everyone, I hope you are all well.

Today I would like you to help me with some research that I am going to do at your school. You and your friends play a very important role in my research. Without you, I cannot do the research, because you have all the answers I am looking for.

What is a research study?

Research studies help us to learn new things. We can test new ideas, by asking questions or doing fun activities and then we try to find the answers. This paper tells you about my research and the choice that you have to take part in it. I want you to ask me any question that you may have.

Why am I doing this research?

I am doing this research to find out if a special programme can help you to go to Grade 1.

What will happen if you join this research?

You will take part in a test so that I can see how prepared you are for Grade 1. You will then take part in a special programme where you will do special exercises, play games and do activities that will be lots of fun. Your teacher will also be part of this programme. After the programme I will do another test to see how much you have learnt. You don't have to worry about giving wrong answers. We will first show you what to do and make sure you understand.

Could bad things happen if you join this research?

I will try my best to make sure that no bad things happen.

Can the research help you?

I think that the research will help you as it will improve important skills that will help you do well in Grade 1.

What else should you know about this research?

If you don't want to take part you don't have to. It is also OK to say yes and to change your mind later. You can stop being in the research at any time, just tell me.

Is there anything else?

If you want to be in the research after we talked, please write your name below. I will also write my name. This shows that we talked about the research and that you want to take part.

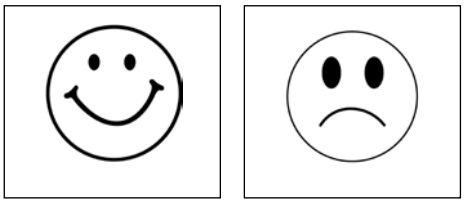
Important things to know…

- **You get to decide if you want to take part in the activities.**
- **You can say "no" or "yes".**
- **No one will be upset if you say "no".**
- **You can say "no" at any time**
- **I will take good care of you no matter what you decide.**

Thank you for listening to me, while I talked about my research.

If you want to be part of the research I talked about, please mark the smiley face below. This is just to show that we talked about the research and that you want to take part in the activities.

I want to take part in the research



Name of participant_____

(To be written by child/researcher)

Printed name of researcher _____

Signature of researcher _____

Date: _____

APPENDIX C: Transcriptions of interviews

Semi-structured interview with Teacher 2 (T2) – August 2016	
I: How old are you T2: 21	
I: What are your qualifications? T2: Educare Level 6	
I: Deur watter instansie het jy jou kwalifikasie verkry? T2: Motheo College	
I: How would you define school readiness? T2: Well if they are able to follow instructions they were given, understand it and interpret what they were told to do then I think they are ready for school.	**Subtheme1.1** Sees school readiness in terms of following instructions, understand instructions and perform instructions**.**
I: Anything else that you would like to add in terms of the different developmental domains, what are your thoughts about that? T2: Well…I think they might have a problem if they don't understand or if you tell them to do something…he understands it but he does it in the complete opposite way or he does his own thing, then there might be a problem.	**Subtheme1.1** Indicates a limited understanding of the different developmental domains that are part of school readiness (narrow view of

	school readiness).
I: What do you think the problem might be? Do you think it is because of the language? T2: I don't think it is because of language because he understands what you tell him to do. He understands everything it is just that doesn't do it.	
I: Do you think it's more of an emotional or social developmental problem or a behavioural problem? T2: Yes, I do.	
I: In line with school readiness, what is your understanding of perceptual-motor development and skills? T2: Hmmmmmm…meaning that when you have to do something?	**Subtheme 1.2** Indicates uncertainty and not being able to conceptualise perceptual-motor development and skills.
I: Yes, perception means the way in which you interpret information that has been gathered through the senses. Motor means either gross motor skills (large muscle movement) or fine motor skills (small muscle movement). This is thus a combination of the information the brain gets *via* the senses and what action is performed after that. T2: If a child cannot like physically perform a task, he might have a problem because then you have to sit with the child tell them everything that…explain it and then they can do it, if they can't then you must…how can I say it…you basically must have a one on one session with them.	**Subtheme1.2** Limited understanding of perceptual-

	motor development. **Subtheme 2.1** Teacher focuses on individual guidance in cases where deficits are established.
I: So you will have individual sessions with them if they struggle? T2: Yes, you must always be around the child.	**Subtheme 2.1** Indicates the role of the teacher to address deficits.
I: How would you describe the relation between school readiness and perceptual-motor development? T2: If a child can't understand or perform an instruction, that might also be a problem for them because if you don't or follow a specific instruction, how is the child then going to do it the next year because it is always going to be a struggle for him. So there is a huge difference between understanding what to do and doing it.	**Subtheme 1.1** Limited understanding of school readiness-school readiness and progress are conceptualise in terms of understanding and performing of instructions.

I: If a child cannot understand an instruction in the language of learning and teaching (Afrikaans) what other ways can you find to help a child to understand? T2: If there is work I would normally do an example to show them what to do and then they will answer yes or no they understand.	**Subtheme 3.1** Role of teacher to demonstrate tasks as examples in case of language related challenges.
I: So what do you mean when you say you will show them? T2: I physically do the exercise. I: So sitting by the child, one on one showing him what to do? T2: Yes, and if it's a lot of children who don't understand I normally let them sit in a group and I will for example do the activities and ask children to yell me what I just did, and to explain the next activity… and so on. Until I have asked all of them. When I see they know, I move on.	**Subtheme 2.1** Teacher's role in assisting learners who are struggling.
I: Do you think that this is a problem when preparing children for school, in other words preparing them to become ready for school? T2: The language? I: Yes T2: It plays a big role, so yes I do think it is a problem.	**Subtheme 3.1** Language is seen as a challenging factor establishing school readiness.
I: So do you think as a teacher a lot is expected of you and do you feel that you are trained enough in order to know how to teach children in maybe a second language and different ways of teaching children who cannot understand the language of learning and teaching? T2: Yes, I do think I can do it.	**Subtheme 3.2** Indicates confidence in own abilities.

I: Which resources are available in your classroom that are there to support you in preparing children to become school ready by means of perceptual-motor development? T2: On the board we normally have the days of the week posters, so we do the posters, we do not only speak about it…I let them go to the board and then they have to point at the stuff that they are saying. So they see how it is written and they know everything. When I give them a day, they will know exactly where the day is because they see it around them every day. I also tell them when they count they must use their fingers to count.	**Subtheme 2.1 and 2.2** Resources available in the classrooms.
I: So they are making use of their bodies? T2: Yes, and we use a lot of clay as well. So they use that and how it feels and everything we do, even if we do physical stuff, they must tell me what they are doing and how it feels and everything.	**Subtheme 2.2** Utilising limited resources available in the classroom.
1: You have a lot of posters in your class, so you have a lot of visual stimuli that you make use of. What else? T2: We also have instruments for example even when we count I will tell them to use an instrument, maybe shake it 5 times and they have to do that and we even use everything, we even use the chairs for counting, and we use coke lids so everything. They know they use their senses a lot. So I will ask them how it feels and how the texture is.	**Subtheme 2.2** Resources available for visual stimulation, instruments utilised for auditory stimulation. Make use of what is available in creative ways. Focusing on

	stimulating the senses.
I: Is there anything in your classroom that you would like to have, that's not here? T2: I actually have everything and the other day a person came requesting that I write down what we don't have in the classroom, so they gave me a book and looked at stuff that we do need, so soon we will get it.	**Subtheme 2.1 and 2.2** Indicates that resources are available in the classes. Planning to order extra resources.
I: What did you order? T2: Aprons for the children to use when they are painting and a ball and mathematics stuff, like posters and number cards with the name on and the dots so that they can count and hula hoops because the old ones we have are very old and I also requested more instruments because there are some instruments we don't have and it was the theme posters, there are some posters that we did have but the ones that the ladies have, have more details on the posters.	**Subtheme 2.2** Utilising limited resources despite the need for additional resources.
I: Which resources are available outside on the playground to support perceptual-motor development? T2: Outside we have a playground, but it is not being enough at all. Because we only have three swings and they have to make turns to use it. That is fine because now they know how to play together but then it is 37 children, all of them can't play on the swing during break as break is only 20 minutes. Then we need more play equipment for them… we only have one slide. They all climb on it and then they play there and they might even get hurt, because they are too much on the slides. We do have tyres but	**Subtheme 3.2** Indicates that limited outdoor space available in terms of number of children. Resources to use outside are also limited and

they do not actually really use it and we have a sandpit but we do not have toys that they can use in the sandpit. They only have the sandpit, so basically what they do is they play in the sand and throw each other with the sand.	in need of maintenance.
I: There is actually a lot of activities that you can use the sandpit for. T2: Yes, we normally when we do a letter we make sure that every week we go out and then they have to go draw the letter in the sand.	**Subtheme 2.1 and 2.2** Creative use of resources that are available

APPENDIX D: Field Notes and research diary

Lines	Field notes: August to November 2016	Analysis
	1 August 2016	
1-28	Arrived at school at 8:30 Learners just had breakfast - samp, mashed carrots and peas The teacher was busy revising months of the year, before, after, between (integrating numeracy and sequential memory; reciting months of the year in sequence) Vocab – such as before, after, between Assistant cleaning class while learners sitting on the carpet Visual closure- 4 squares of paper handed out – teacher explains that we only see half of the shape- to see full shape we need to cut it out and open it Teacher show them what to do. Children perform task by assembling picture from the shapes- ideally children must use their creativity to put picture together. In terms of language, most learners spoke Afrikaans which was one of the LOLT of the schools. However, the rest of the learners represented the rest of South Africa's 11 official languages. This was considered as challenge	Narrow view of school readiness- learners repeating what teachers says. Intervention: Children are seated on the carpet while teacher is explaining and answering questions. Teacher assisting learners of they do not understand. Teaching strategy- demonstration. Children seem reluctant to use their own initiative – used to being told what to do) Language as a limiting factor for school readiness and learner development.

	31 August 2016	
178-195	I arrived at school at 9:00. Learners were coming back from bathroom routine. It is raining in Bloemfontein. Visual closure activity Teacher demonstrated and explained activity. Asked questions for learners to identify learners. Need to identify other half of animal to "complete" animal (fitting one half of picture with the other half) Resources that were seemingly utilised for fine motor development that I observed in the classroom included containers with wax crayons, pencil crayons, lead pencils, scissors, paint brushes and powder paint	There is no playing outside as everything is muddy and wet. Intervention: General observation: Cutting is not good-seem to be uncoordinated. Learners are struggling to cut on the line, indicating problems with bilaterally. Learners struggle to support dominant hand with non-dominant hand.
Excerpts from reflective journal:		
12 August 2016		
29-36	Many resources were packed and stored in cupboards and not put out for learners to use. Resources that were displayed and used were, wax crayons, pencil crayons, lead pencils, scissors, paint brushes and paint. Learners received stationary packs from DoE. Teacher take out stationary as needed.	Learning resources
37-44	Classroom (School B) is very dusty and dirty. No storybooks are available. No puzzles are seen. Teacher claims that	Indoor environment Resources

	there are only English puzzles and the other are old and outdated with pieces missing. One classroom had a piece of its ceiling missing. Windows are cracked and some were broken.	

14 September 2016		
143-152	Generally I observed that teachers showed limited understanding of the different developmental domains. After some guidance from me, they did realise what was meant by developmental domains. They displayed a strong focus on cognitive development. Perceptual development was a ‘new’ term. I also did not observe many activities in terms of emotional, moral and social development.	Narrow view of school readiness and limited understanding of perceptual-motor development.

APPENDIX E: Perceptual-motor intervention

PROGRAMME

WEEK 1:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
EYE-HAND COORDINATION	Soap bubble gun	Warm up: learners stand in circle, sing an action song. Blow soap bubbles, children must first use right hands to catch a bubble (pop) and then left hand.
VISUAL INTEGRATION	Letter cut out of card e.g." (+/-10cm big) Salt Polystyrene tray with salt	Provide learners with letter card Trace letter with finger Sprinkle salt on the letter Write letter in polystyrene tray with finger
VISUAL CLOSURE	Paper with half shapes drawn onto them Scissor Coloured paper glue	Learners are provide with a sheet of paper cut into small squares. Each square is cut folded in half and half of a shape is drawn onto it. Learners are provided with a scissor and may cut out the shape after they were able to identify it correctly. After shapes have been identified and cut out they must use these shape and pate it onto the coloured paper to form a picture or pattern of their own choice.
VISUAL ANALYSIS AND SYNTHESIS	Front of Cereal boxes cut into pieces	Front of cereal box cut into pieces (12-20 pieces). Children must pack "cereal puzzle"

WEEK 2:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
NUMBER GAMES	Big dice made from cardboard box	Warm up: Counting 1-10 and backwards. Counting rhyme. Children make groups of 6. Each group is provided with a box dice. One child rolls dice. Children must jump the number of dots that dice shows. Repeat until all children had a turn.
SPATIAL ORIENTATION	Chairs music	Warm up: Chairs are packed in a circle. Each child sits on his or her chair. When music starts, two chairs are taken out of the circle. Children move in an anti-clockwise direction, when music stops children must sit on a chair. Those not sitting down, are out. Continue until only one or two children are left. Children are required to stand behind hishe or her chair. Teacher holds up card, and give instruction “stand in front of your chair” etc.
AUDITORY MEMORY	8 paper plates with images of rhyming words pasted on each plate.	Warm up: Action song with movements Children are grouped into small groups of 8. Plates are packed upside down into two parallel lines. Each child gets a turn to turn around two plates, they must say the words out loud. If the words rhyme, the plates must be removed, if words do not rhyme, the plates must be placed back upside down and the next player gets a turn. Children must try and remember where the plates are with the rhyming words.

WEEK 3:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
AUDITORY ANALYSIS AND SYNTHESIS	Chalk Hop scotch	Warm up: children sing a song applicable to theme of the week. Make use of body percussion while singing the song. Children are taken outside. Hopscotch design is drawn on paved area. Children must jump while sounding their names, e.g. Lin-di-we
EYE- HAND COORDINATION	Kebab sticks Take away containers Fruit loops	Warm up: Children make a circle, sing action song. Make use of movements Each child gets a take away container with three kebabs sticks stuck in (each stick is numbered 8, 9 10). Children must pick up one by one fruit loop and “string” it onto stick according to the number, e.g. the number 8 stick gets 8 fruit loops
VISUAL INTEGRATION	Paper plates with holes punched in Holes numbered 1-6	Spider webs: Children draw spider in middle of paper plate. Thread wool from one hole to hole on the opposite side of paper plate. Move to next hole and repeat.
VISUAL CLOSURE	Visual closure puzzles Visual closure (semi-concrete) worksheets Crayon pencils	Warm up: Teacher instruct learners, “sit on the ch… (Chair)” etc. Learners fit halves together to complete a picture (visual closure puzzle. After this activity has been accomplished by learners they are provided with a worksheet and need to complete images.

WEEK 4:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
VISUAL ANALYSIS ANS SYNTHESIS	Jig saw Puzzles (handmade)	Children are divided into small groups and provided with puzzles (handmade) Teacher shows learners how puzzle is put together, by first packing the frame and then completing it by adding the other pieces
NUMBER GAMES	Cupcake holders Marshmallow chopsticks	Warm up: Number song. Teacher give instruction: Jump 5 times, high five your friend three times etc. Learners are provided with numbered cupcake holders, chopsticks and small marshmallows. Learners are to pick up a marshmallows and place into the cupcake holder as many as holder is numbered, e.g. if holder is numbered 5….learners are to place 5 marshmallows into a holder.
SPATIAL ORIENTATION	Bean bags Hula hoops	Warm: Learners to do stretch exercises with hula hoops. Hold hula hoop in front of you, stretch to the left, stretch to the right. Learners are required to put hula hoop in front of him. Instructions are given: Stand in your hula hoop, stand next to your hula hoop, stand behind your hula hoop, and stand in front of your hula hoop. Learners are now provide with bean bags. Instructions are given: Place your bean bag in your hula hoop, place your bean bag in front of your hula hoop, Place your hula hoop behind, next to etc.

AUDITORY MEMORY	Recording of different sounds: doorbell, barking dog, slamming door, toilet flushing etc. Auditory memory cards	Introduction: Children are divided into small groups, sound is played and learners must identify sound. Teacher now ask learners to recall the sounds. Teacher ask learners to listen carefully and recites 4 words in sequence. Learners are required to recall words. Auditory memory cards are provided. Teacher works with children in small groups. Child draws card, and teacher reads out instructions on card. Child must listen and then perform instructions, in sequence.

WEEK 5:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
AUDITORY ANALYSIS AND SYNTHESIS	Flashlight Black board	Warm up: Learners are instructed to say their names and then clap it dividing it into syllables, e.g. Lindiwe – Lin-di-we. Each child gets a turn. Teachers now plays 3 notes on a xylophone, learners listen and sings tune, e.g. do me la. Conclusion: Teachers sounds out word “m-a-t” and learners put word together mat.
AUDITORY CLOSURE	Puzzle matching cards	Warm up: Children start by saying a rhyme. Children say the rhyme again, but omit the last word. Continue with rhyme and omit last two words or first word etc.

		Children are provide with matching puzzle cards, e.g. picture of a cow and a bottle of milk. Learner must say: “The cow goes with the bottle of milk.
AUDITORY ASSOCIATION AND CLASSIFICATION	Word cards	Teacher work with children in a small group. Recite a list of 3 words. One word does not relate to the other two, e.g. Knife, fork, tree. Teacher display word cards while saying the words out loud. Children have a look at the cards and decide which picture does not go with the other two. Second round, teacher only cites the words, and children must listen carefully and tell which word does not go with the other two words.

WEEK 6:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
EYE HAND COORDINATION	Pool noodles cut into 30cm pieces Hula hoop Beanbags Cardboard box Water gun Blackboard easel	Warm up: children warm up by stretching, running, jumping on one leg and balancing on one leg. Eye hand coordination obstacle course: Set out three stations, children are divided into three groups. Station 1: pool noodles are thrown through a hula hoop hanging from the roof. Station 2: Children throw bean bags through shapes cut into a cardboard box. Station 3: Children use water pistol to shoot at a target drawn on a blackboard easel. Children make turns until everybody had a turn and then group move to next station.

VISUAL INTEGRATION	String Beads Pattern cards Gestalt cards	Children are provided with pattern cards, string and beads. Children must string beads according to pattern cards. Children are provided with gestalt cards.
VISUAL CLOSURE	Complete the picture work cards	Children are given laminated visual closure cards. Once it is completed, they swop with a friend.
VISUAL ANALYSIS AND SYNTHESIS	Cereal box puzzles	Warm up: Children sing action song and do physical movements. Children are provided with cereal box puzzles to put together. Once completed they are given another one that consist of more pieces.

WEEK 7:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
NUMBER GAMES	Small fish shapes A4 picture of a fishbowl dice	Warm up: Each child receives an A4 picture of a fishbowl. Children are required to colour in their picture. Children are grouped into small groups. Each child receives small fish shapes and the group receives die. Each child gets a turn to throw the die. Number of dots thrown are counted and child gets to count the number of small fish and place it back into the fishbowl. First child to get all 20 fish back into the fishbowl is the winner.
NUMBER NAMES AND SYMBOLS	Coin Laminated A4 page	Teacher uses coins to drop one-by-one into a can so that they make a loud noise. Children should not be able to see the teacher drop the coins, but have to rely on listening for the sound. Children should make one tally mark

LISTENING SKILLS	Whiteboard marker	on their Laminated page for each coin they hear drop. When teacher is finished, children count the tally marks and write the correct number on their whiteboards. Have children hold up whiteboards for easy checking. NOTE: This is a great transition activity to improve listening skills and students love it!!
SPATIAL ORIENTATION	3 Lego blocks (Red, green, blue) Spatial orientation cards A4 Paper with a square drawn in the centre of the page Coloured crayons	Warm up: Teacher reads a story (Related to spatial orientation, e.g. Where is Teddy's shoes?" Each child is provided with 3 Lego blocks, red, green and blue. Teacher first shows card and say instruction: "Put the red block on top of the blue block" etc. Teacher provides instructions: Colour the square red, and draw a blue triangle on top of the square etc. Teacher continue providing instructions.
DRAW A MAN	A4 page with body parts drawn onto Blank A4 Glue Scissor Coloured crayons	Warm up: Sing a song introducing body parts. Children are required to sit with a friend and point to different body parts, first on themselves and then on their friend. Children are required to colour in different body parts and then cut it out, paste it on blank A4 page, to resemble a human figure. Children are asked to provide detail to their pictures, e.g. grass, flowers, sky, clouds, sun etc.

WEEK 8:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
AUDITORY MEMORY	Story book Story sequential cards with pictures of events in story Worksheets with same pictures as story sequential cards	Warm up: Recite rhyme, applicable to theme of the week. Teacher reads chosen story. Teacher chooses 6 learners and asked to stand in front of class. Each learner is provided with a card with a picture that resembles a scene in the story. Other learners are asked to put cards in sequence. “What happened first?” learner with first scene moves to the left side, “What happened after this?” children identify next card etc. After completion of this, children are provided with a work sheet, with same pictures as seen on story cards and asked to number each picture as the story unfolded in the book.
AUDITORY ANALYSIS AND SYNTHESIS	Hopscotch design	Warm up: Children are taken outside. Hopscotch design is drawn on paved area. Children must jump while sounding their names, e.g. Jay-don etc. Teacher holds up card with a picture, e.g. “banana”. Child say word out loud and then clap word, breaking it into syllables. Child now uses the hopscotch design to jump word, e.g. ba-na-na. After jumping child says word in syllables and then word in whole.
AUDITORY CLOSURE	Auditory closure worksheets	Teacher divides children in small groups. Each child is provided with 5 visual clues.

	Auditory closure puzzle cards (visual clues)	She reads them a sentence leaving out the last word in the sentence, E.g. In summer it is hot but in winter it is … Childs selects picture card from his pile that represents "cold".
AUDITORY ASSOCIATION AND CLASSIFICATIO N	Sound cards and picture cards	Children are divided into small groups. Each child is provided with 3 – 4 picture cards picture with a different beginning sound. Teacher places sound, e.g. "a" in the middle of group. Each child now gets a turn to look for a picture card that also begins with "a".

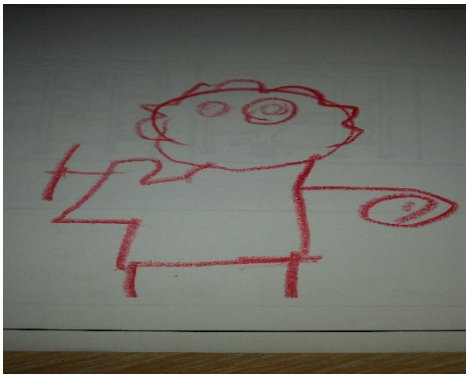
WEEK 9:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
EYE-HAND COORDINATION	Beanbags Ball on a string Skittles and ball	Warm up: Children sing action song and do the actions. Children are divided into three groups. 4 Stations are set up on playground. Station 1: Children are instructed to throw beanbag up and catch it with one hand (dominant hand). Station 2: Children are provided with a bat and small rubber ball attached to bat with an elastic string. Children must hit ball at least 5 times and pass it to next child. Station3: Skittles are packed and children are instructed to stand at least two metres away. Ball is rolled in an attempt to knock over skittles. After completion of one station, children move to next station.
VISUAL INTEGRATION	Take away container filled	Teacher revises sound of the week. Ensuring that children recognise the letter and sound.

	with sand from sandpit Big letter taped onto carpet making use of masking tape	Children are now required to “write” the letter on their friends back with their finger. Children are now required to walk on the letter. Children use their fingers to write the letter in the sand tray. Teacher checks to see if children are doing it correctly.
VISUAL CLOSURE	Play dough Cards with shapes (only one half of shape is shown)	Children are required to roll out play dough into “snakes”. They receive cards with half shapes and must use play dough to construct the complete shape.
VISUAL ANALYSIS AND SYNTHESIS	Picture (A4 size) Crayons Scissor glue	Picture puzzle: Pictures are handed out to children. Children must colour in picture. After completing the colouring, children must turn picture around and cut picture into pieces. (Lines are provided on the back of picture – children must cut on lines) After cutting children must “pack” pieces together to put picture together again. After packing children can paste pieces on a blank page.
WEEK 10:		
FOCUS	**EQUIPMENT**	**ACTIVITY**
NUMBER GAMES	Big dice with numbers Big dice with dots	Warm up: sing a number song Children are divided into groups. One child rolls dice with dots, another child must roll

		dice until number is found that matches number of dots. Worksheet provided with numbers and dots. Children must now match number of dots with correct number and *vice versa.*
SPATIAL ORIENTATION	Newspaper page Body	Warm up: Children are instructed to march on time while teacher hands out a sheet of newspaper to each child. Children are instructed to place newspaper in front of them. Teacher gives the following instructions. Jump on to the newspaper. Stand next to the newspaper, jump over the newspaper, and sit under your newspaper. Crumble newspaper into a ball, and give the following instructions: Hold your newspaper ball in your left hand …into your right hand. Clasp it between your knees, and jump to the dustbin, without letting it fall. Throw your ball into the dustbin.
AUDITORY MEMORY	Story book Story sequential cards with pictures of events in story Worksheets with same pictures as story sequential cards	Warm up: Recite rhyme, applicable to theme of the week. Teacher read chosen story. Teacher chooses 6 learners and asked to stand in front of class. Each learner is provided with a card with a picture that resembles a scene in the story. Other learners are asked to put cards in sequence. “What happened first?” learner with first scene moves to the left side, “What happened after this?” children identify next card etc. After completion of this, children are provided with a work sheet, with same pictures as

		seen on story cards and asked to number each picture as the story unfolded in the book.
AUDITORY CLOSURE	Auditory puzzle cards	Warm up: Children start by saying a rhyme. Children say the rhyme again, but omit the last word. Continue with rhyme and omit last two words or first word etc. Children are provide with matching puzzle cards, e.g. picture of a cow and a bottle of milk. Learner must say: “The cow goes with the bottle of milk.

APPENDICE F: Excerpt of visual data



Fine motor development (Draw a man sub-test) (School A, 6 September 2016)

Fine motor development (Draw a man sub-test) (School A, 6 September 2016)

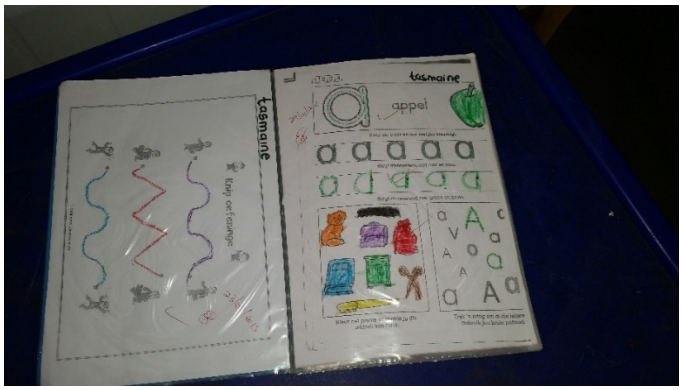
Resources packed away in cupboards (School A, 6 September 2016)

Fine motor development resources; retractable crayons, paint and glue (School A, 6 September 2016)

Indoor environment: Posters on the wall (School A, 16 September 2016)

Limited resources. Old television and toys used for fantasy play (School B, 6 September 2016)

Expectations and stipulations of the curriculum: CAPS (2011) workbook (School A, 16 September 2016)



Expectations and stipulations of the curriculum: CAPS (2011) workbook (School B, 16 September 2016)

Outlay of playground with jungle-gyms and swings (School B, 16 September 2016)

Outlay of playground with jungle-gyms and swings. (School B, 16 September 2016)

Outlay of playground with jungle-gyms and swings. School A, 16 September 2016)

General state of playground of (School B, 16 September 2016)

General state of playground, sandpit in need of sand (School B, 6 September 2016)

Resources: Retractable crayons, glue, lead pencils, wax crayons (School B, 6 September 2016)

Limited resources. Broken toys used for fantasy play (School B, 6 September 2016)