UNIVERSITEIT VAN PRETORIA
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Faculty of Education

The design and use of an outdoor learning environment for sensory and motor stimulation

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2016

The design and use of an outdoor learning environment for sensory and motor stimulation

by

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Submitted in partial fulfilment of the requirements for the degree

MAGISTER EDUCATIONIS

Faculty of Education
University Of Pretoria

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PRETORIA
APRIL 2016

DEDICATION

I dedicate this study to the inner longing of every child to learn more with every exploration they endeavour. They deserve the best opportunities that we can possibly provide in this regard.

I also dedicate the study to every adult who will use this study to enrich learning environments and in turn enrich lives. I salute every effort in this direction. My heart's desire is to give the learners more!

"So you should enrich it (learning experiences) in the sense that they can be experiencing new things all the time, or building on what they know and furthering it, because children want to learn.

They want to see new things, they want to learn MORE"

(Interview 3, Teacher 3, p12)

ACKNOWLEDGEMENTS

I acknowledge that my Heavenly Father kept His promise in Isaiah 41:10: “Do not fear, for I am with you. I will strengthen you, and help you”. I thank Him for this promise, it calmed my anxiety and helped me through deep waters when I thought the finish line to be out of my reach.

I acknowledge my supervisors, Prof Joubert and Prof Hartell, for the role they played in giving guidance and encouragement throughout the research process. They believed in my abilities even when I myself felt unsure at times. It is rare to find individuals one can really look up to as mentors who inspire on the level that they do. I thank them deeply for the crucial part that they played in making this study a reality.

I acknowledge the sacrifices that my husband Jandré made so that I could spend time in front of the books. I will always be grateful for the opportunity to have completed this master’s degree, and even more grateful for all the sacrifices that were made to make it possible!

I acknowledge PG, Hardus and my dad for their help with the site maps. Also all my friends and family, who kept giving encouragement and who were patient when I turned down social time because I had to study. I thank all the babysitter friends, aunties and “oumas” in particular too! ☺

I acknowledge Karlien for being such a wonderful principal at my nursery school, allowing me to complete my master’s degree with the peace of mind that my school was in good hands.

I acknowledge the role of the University of Pretoria and the European Union bursary that abled me to complete this magnificent journey!

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DECLARATION OF AUTHENTICITY

I, Anca Nel, hereby declare that all of the resources consulted are included in the reference list and that the present study titled:

The design and use of an outdoor learning environment for sensory and motor stimulation

is my original work. This thesis submitted in order to meet the partial requirements for the degree: Magister Educationis was not previously submitted by me for any other degree at another university.

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ANCA NEL **DATE**

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DECLARATION FROM EDITOR

ABSTRACT

This qualitative study makes recommendations to help teachers understand how an outdoor learning environment could be designed and used to enrich perceptual development through sensory and motor stimulation for the Grade R learner. This was done by establishing design principles that create better teaching and learning environments from the perspective of an educator in the South African context.

Three purposively selected case studies (pre-schools) enabled the collection of data using collection methods (Burton & Bartlett, 2009:63) such as photos, video clips, interviews, observations and document analysis. Content analysis was conducted, resulting in themes and sub-themes (Creswell et al., 2010:298) on which conclusions were drawn based on similarities and differences in data and existing literature. Four themes emerged: 1. contradictory perspectives on outdoor learning environments; 2. outdoor play is valuable; 3. creating the ideal outdoor learning environment and 4. increased deficiency of sensory and motor development among Grade R learners.

The theories employed in this study were: 1. eight universal principles for the design and use of an outdoor learning environment for sensory and motor stimulation obtained from the work of Montessori (Montessori, 1988), Malaguzzi (Cadwell, 2003) and the Scandinavian Forest School Movement (Knight, 2009) and 2. the model of Slabbert (2009) for facilitating learning (Slabbert, De Kock, Hattingh, 2009).

This study resulted in helpful data collection tools and outdoor learning environment evaluation rubrics, including: 1. a map containing schematic detail of each site (see e.g. Fig 3.3 pg 60); 2. an inventory documenting site details and the relevance for sensory and motor stimulation (see e.g. Table 3.1 pg 61). 3. a rubric recording the site features for sensory and motor stimulation (see Addendum 4); and 4. a rubric for the design and use of an outdoor learning environment for whole-child development (see Addendum 3).

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KEYWORDS

- Grade R learner
- Perceptual development
- Sensory stimulation
- Motor stimulation
- Enquiry-based learning
- Outdoor play
- Outdoor learning environment
- School learning readiness
- Minor learning difficulties

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CHAPTER 1: OVERVIEW OF THE INQUIRY

The design and use of
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1.1 INTRODUCTION

The capability to gain, understand and react in an appropriate manner to sensory and motor experiences is known as perceptual development. Perceptual development of the Grade R learner is enhanced by sensory and motor stimulation and has an impact on learning readiness for Grade 1 (Rushton, Juola-Rushton & Larkin, 2010; Erasmus, Van Rensburg, Pienaar & Ellis, 2011:46). Sensory and motor stimulation do not only take place in the classroom; much of it takes place outside, on the playground, if the environment is favourable. It is important to know how perceptual development takes place on the playground in order to identify favourable environments and to modify existing learning environments optimally (Rushton et al., 2010:354).

How perceptual development takes place through sensory and motor stimulation is not always clear to educators and other professionals in related fields. Cognitive psychologist Jerome Bruner (2010:44) said that it was difficult to understand how perceptual processes are "affected by other concurrent mental functions and how these functions, in their turn, are affected by the operation of perceptual processes". The aim of this research project, though, was not to investigate the intricacies of how movement and sensory stimulation lead to perceptual development. Due to its complexity, such research would be better suited to a doctoral study.

The purpose of this study was to formulate recommendations that would help educators understand how an outdoor learning environment could be structured to enrich perceptual development. A literature study was done to establish existing principles of a sensory and motor-stimulating playground. An understanding needed to be gained of the principles of design and use whereby Grade R playgrounds could be developed to offer sensory and motor stimulation to enhance perceptual development. The research further intended to qualitatively explore how teachers perceive the design and implementation of an outdoor learning environment to optimally stimulate the sensory and motor functions of Grade R learners in South Africa by investigating playgrounds planned and facilitated by Grade R teachers and employed for perceptual development. This research focused on the educator's perspective of such outdoor learning environments, as it is the educator who spends much time facilitating learning in such an environment.

The background to this study is the fact that I (the researcher) have owned a nursery school for the past twelve years, with first-hand experience of the need for outdoor playgrounds to enhance learning. The South African climate is ideal for more outdoor activities. Facilitators of learning can make use of this opportunity by structuring an outdoor learning environment that is conducive to perceptual development (Rushton et al., 2010:354). Despite the favourable weather, however, my experience has been that there are increased restrictions on children's free roaming outdoors due to concerns parents have about the safety of their children. Moreover, the families in my catchment area are increasingly moving into smaller, "more secure" home spaces such as flats, and movement on the school playground is of the utmost importance to compensate for these restrictions.

In order to accomplish the proposed research, general and research literature on all these related aspects needed to be investigated, for which an empirical, reflective practice was followed (Slabbert et al. 2009: 35). From the literature it was evident that little research had been done in South Africa on the design of an outdoor learning environment for the use of sensory and motor stimulation. The present research adds to the limited research already done by undertaking a qualitative investigation of South African teachers' perceptions and implementation of these principles. The research verified how the findings corresponded to and correlated with the existing literature and that this research could contribute to the existing literature.

1.2 RATIONALE OF THE STUDY

The need for this research arose from my own experiences as a nursery school owner when discussing the learning opportunities on the Grade R playground with school staff. These included aspects such as play environments that were not sufficiently stimulating (Erasmus et al., 2011), the limited knowledge of how sensory and motor stimulation relates to perceptual development and the limited practical skills to apply available information. I wanted to redesign our playground for sensory and motor stimulation in order to catalyse learning in general, as well as the development of perceptual skills, especially in South African Grade R learners.

A playground that aids perceptual development is also a great advantage for learners with minor learning difficulties (Stoneham, 1996:11). I assumed that if perceptual development took place optimally, there could be a decrease in minor learning difficulties, and children would generally be more successful at learning and understanding their environment. I wanted an outdoor play environment that could complement and extend the learning that takes place in the classroom.

The objective of this research was to determine how sensory and motor stimulation in the outdoor learning environment could benefit perceptual development and ultimately cognitive development of the Grade R child. I investigated what is meant by an outdoor learning environment and how it is designed and used by facilitators of learning and learners to stimulate the child through directed activities and free

or facilitated sensory and motor play. The specific contribution of the research was to investigate the above from the perspective of an educator in the Pretoria area and to compile a guideline on the use and design of outdoor learning environments for perceptual development of the Grade R learner. Three schools with Grade R playgrounds were investigated.

The assumption was that if Grade R teachers and assistants were aware of and facilitated perceptual development through sensory and motor stimulation in the outdoor learning environment the environment would contribute to the learner's cognitive development. It was further assumed that if the outdoor learning environment were designed with perceptual development in mind, the learners would benefit more from outdoor play.

1.3 PURPOSE STATEMENT

The purpose of this research project was firstly to determine how educators in the Pretoria area employ the outdoor learning environment to enhance perceptual development through sensory and motor stimulation. Secondly, the aim was to explore how the outdoor learning environment contributes to perceptual development of the Grade R learner in order to identify an optimal design and use of this environment.

1.3.1 POSSIBLE CONTRIBUTIONS OF THE STUDY

This research project attempts to determine the principles of the design and use of a Grade R playground intended to enhance perceptual development through sensory and motor stimulation. The study might be transferable to other cases or schools. It could also serve as a basis for further research, given the vastness and complexity of perceptual development and authentic learning as a holistic process (Slabbert et al., 2009:68).

1.4 RESEARCH QUESTIONS

The following section sets out the primary research question as well as the five secondary research questions of the study.

1.4.1 PRIMARY RESEARCH QUESTION

The primary research question for this study is the following:

How can the outdoor learning environment be designed and used to enhance sensory and motor stimulation of the Grade R learner?

1.4.2 SECONDARY RESEARCH QUESTIONS

- What is sensory and motor development and how does it take place?
- What are the sensory and motor development milestones for the Grade R learner?
- What constitutes an outdoor learning environment of the Grade R learner?
- How do educators employ the outdoor learning environment for sensory and motor development of the Grade R learner?
- How does sensory and motor stimulation impact on the Grade R learner's development and ability to learn?

1.5 A HISTORICAL OVERVIEW OF OUTDOOR LEARNING ENVIRONMENTS

In order to obtain a broad background knowledge of the research topic and to position this study relative to what has already been studied by others, I reviewed relevant research issues historically, tracing configurations of knowledge and practice over time (Jansen, 2008). For this study, I assumed that perceptual development through sensory and motor stimulation of the young child outdoors, incorporating nature and natural elements, could increase cognitive development and contribute to school readiness. I therefore investigated existing literature to ascertain whether this was indeed the case and to what extent this assumption is true. Past studies outlining configurations of research plus "practice over time "(Jansen, 2008) further inspired the development of my topic. I was pleasantly surprised to discover that in very early writings, philosophers and educationists pointed out the importance of learning through play during the first years of a child's life and how play should be used for teaching and education (Verster, 1992:207). The outdoor learning environment has been integrated into early childhood education since its foundation (Wellhousen, 2002:17) and has continually provided the channels for holistic methods of education that make learning come alive (Beams & Brown, 2014:129).

Plato (427-347 B.C.) regarded educative play as fundamental for exercising "the child's motor capabilities, his power of discrimination and his intellectual abilities" (Verster, 1992:207). Comenius (1592-1670) said that opportunities and circumstances that would make it possible for a child to play happily and spontaneously were to be provided to develop the senses and sharpen the memory. He regarded the "playground as an essential requirement for any well-organized school" (Verster, 1992:208). Wellhousen (2002:17) states that outdoor play was the nucleus of the early nursery schools. A slightly different opinion is expressed by Feez, an author on the Danish Forest School Movement (2011:7-9), who states that the outdoor learning environment started as an insignificant component of society, but has since evolved to an all-important place in education and politics (Feez, 2011:7). Feez (2011:7-9) describes the metamorphosis of the "fresh air life", translated from the Danish "friluftsliv", as following three noticeable periods, which she divides into the 1700s, the 1800s and post-1970.

During the first period, Jean-Jacques Rousseau's theories on how beneficial natural surroundings can be for educating young children drastically changed the way people viewed the outdoors. This was in the time when people were only starting to enjoy nature instead of feeling threatened by it (Eichberg & Jespersen, 2009: 28 in Feez, 2011:9).

During the second period (the 1800s), outdoor kindergartens were established for the children so that they could have better health and the enjoyment of natural surroundings. People were becoming more urbanised during the industrial revolution and families had fewer opportunities to be in nature. In 1840 in Germany, Froebel's earliest kindergarten inspired many educationists, such as Headmaster Sorensen, who opened a "play and preparatory" school in Denmark in 1854. According to Sigsgaard (in Feez, 2011:8), Froebel wrote: "Children at the ages of four and five should not be imprisoned in a dirty, airless classroom, at such a young age they should have play and movement, especially in the fresh air" (Sigsgaard, 1978:40). Also during this period, Bagger (in Feez, 2011:8) showed an interest in school play areas and the gardens. It was his conviction that children living in the cities should be more familiar with natural phenomena and surroundings. In accordance with this conviction, he opened a "public kindergarten for ordinary working people" with the help of his spouse Hedevig. This "folkebornehave" as it was known in Danish, had animals and big burrowing spaces where the preschoolers could toil and play to experience nature in a tangible manner.

Also in this period, an adventure play area, also called a "junk" playground by its founder Bertelsen, opened in Copenhagen in 1943. The leading fundamentals of "playground pedagogy" were laid here and have been imitated and expanded upon around the globe. As described by Sigsgaard (in Feez, 2011:8), this playground was filled with cast-off timber, implements and salvaged bits and pieces that youngsters could use to make items and play with. Another educationist, Flatua, was also of the opinion that children should be in nature during the day. As stated by Bentsen et al. (in Feez, 2011:9), Flatua was the founder of the initial nature kindergarten when she began a "wondering kindergarten" in 1952, known as a "vandrebornehave" in Danish. Here the children played in the woodlands and meadows, and the parents collected them again at a log cabin assembly area at the end of the day.

In the third period (post-1970), there has been an increase in using the outdoors for learning as the educational advantages of children interacting with nature were more widely appreciated (Feez, 2011:7-9). Even so, it is evident that "…children's opportunities for outdoor play outside contexts such as school and childcare have undergone significant erosion" (Prince, Allin, Sandseter, & Ärlemalm-Hagsér, 2013:183). This is not only true of school yards, but also of schools themselves. Over the last forty years, social, political and economic influences provided motives and funding for exploring new models of teaching young children. While progress is to be embraced, it should never be at the cost of a tried and true element of education. Sadly, this is the case with outdoor play (Wellhousen, 2002:17), as outdoor play ranks high among the diminishing activities (Wellhousen, 2002:13).

I realised that my thinking about the educational value of natural playgrounds is not new. The idea has been around for centuries. A relevant question that the historical literature did raise, however, was that if the benefits of the stimulation of natural environments have been advocated since the early writings of philosophers and educationists, why is it that the average playground and play parks in South Africa (according to my experience and relevant literature) are seriously lacking in this regard and have mostly steel climbing equipment that focus on gross motor skills? There seems to be a lack of sensory stimulation and fine motor stimulation that natural environments can offer and that is needed for perceptual development and school readiness, as will be discussed later in the literature review.

1.6 CONCEPT CLARIFICATION

A short summation of the main concepts in this study is given in this section. For the purpose of clarity, the concepts of the study and their interrelations are represented in Figure 1.1

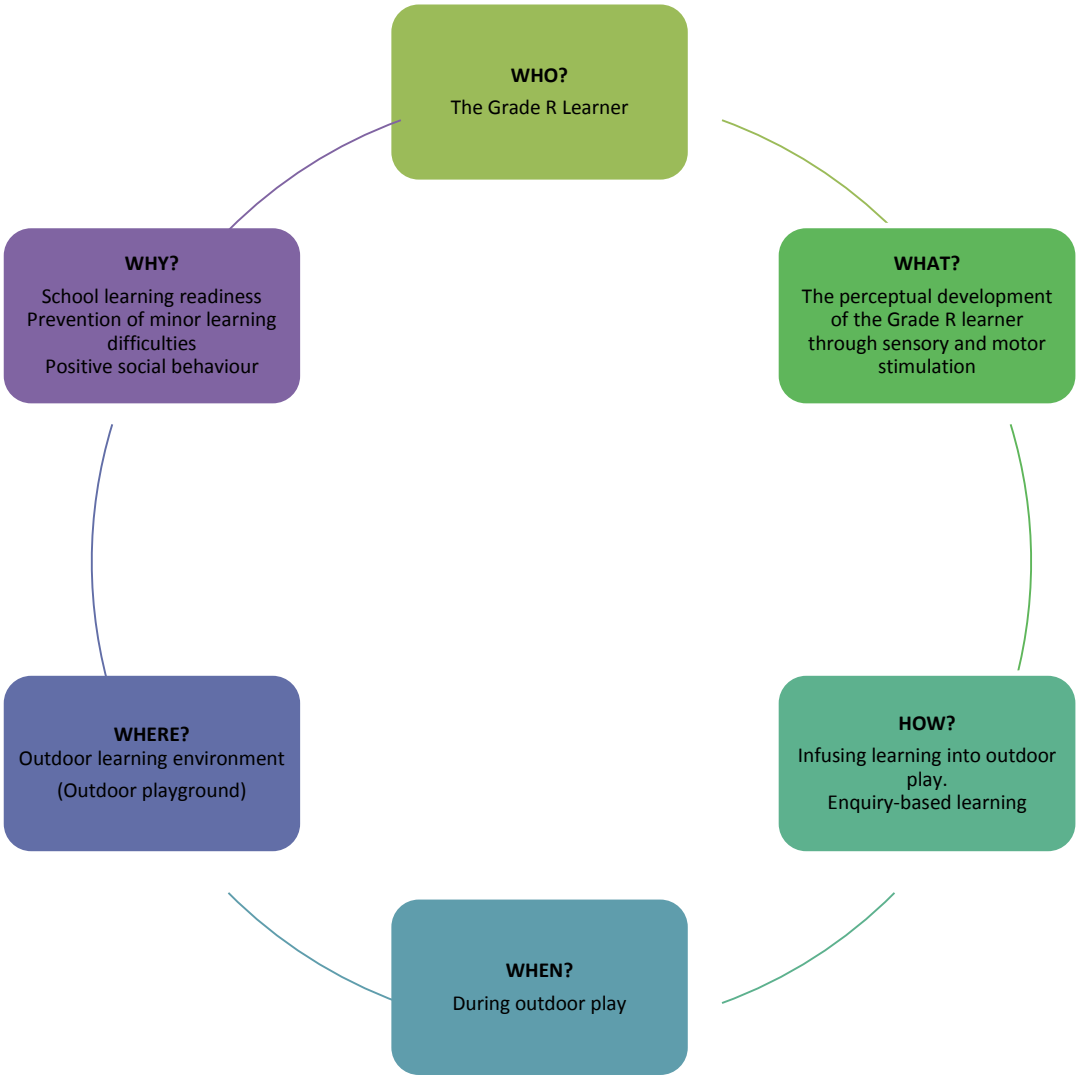

Figure 1.1: Concepts of the research study

1.6.1 THE GRADE R LEARNER

The early childhood years are very important for developing a child's potential as a happy and successful human being. A child between five and seven years of age can play and learn if provided with the right setting. To this end, the country's new education dispensation prescribes a compulsory pre-school year (Faber & Van Staden, 1997:1), and the learners participating in this compulsory pre-school year are known as Grade R learners or "reception year learners".

1.6.2 PERCEPTUAL DEVELOPMENT

The child between four and seven years "depends heavily on perceptual experiences and is forming applicable thought structures" (De Witt & Booysen, 1995:15). Perceptual development includes sensory stimulation, movement (motor stimulation) and cognitive development. Perceptual development is a complex process which is partially dependent on the child's genotype, the maturation of his sensory system, the kind of sensory experience available to him for analysis and interpretation, his developing cognitive abilities and the social context in which he functions (Botha in De Witt & Booysen, 1995:85).

1.6.3 SENSORY STIMULATION

In its simplest terms, according to Schmidt (2003), sensory stimulation refers to the impact the environment has on our minds and bodies as we receive information of the world around us through our senses. In the literature review I found that there are more than the traditional five senses commonly known (sight, smell, touch, hearing, taste) and that all of these influence development and learning. These are the chromatic, thermic, baric, stereognostic, kinesthetic and the vestibular senses (Faber & Van Staden, 2005:43). Sensory stimulation produces a reaction from the young learner internally and externally, and the ability to react to this stimulation plays a big role in the learner's cognitive development.

1.6.4 MOTOR STIMULATION

"…the young child (is) a celebration of movement. The child is ever moving, as it were, on a journey of discovery through the world. The urge to move involves more than just movement. The child directs himself at the world around him in order to get to know what everything is like. Every time the preschool child finds something new, and attempts to make it his own by means of movement, he is discovering himself while moving. He is broadening his own potentialities in several respects. He is unfolding and developing himself. It is by doing that men learn" (Van Asch in De Witt & Booysen, 1995:65). For the purpose of this study, the term "young child" is also the learner, because of the natural way in which the child experiences his world through motor stimulation. Motor stimulation is activated by sensory stimulation. The child reacts to the things in the environment through his senses.

1.6.5 ENQUIRY-BASED LEARNING

For the purpose of this study, enquiry-based learning is used as an umbrella term for several similar concepts found in the literature, such as "free-choice learning" (Ghafouri, 2014:57), "self-directed" learning (Prince, Allin, Sandseter & Ärlemalm-Hagsér 2013:186) and child-initiated learning (Maynard, Water, & Clement, 2013:212). Enquiry-based learning includes free play, but also includes the instances when the teacher creates and facilitates an environment where the child engages in authentic learning (Slabbert et al., 2009:118). The learning can therefore be teacher-initiated in the sense that the teacher creates the appropriate environment for learning, resulting in learning that is child-initiated (Maynard, Waters, & Clement, 2013:221) and self-directed, as the child builds their own learning experiences. The child builds these learning experiences by constructing his or her own meaning (Ghafouri, 2014:54; Slabbert, et al., 2009:118) through active exploration of the phenomenon.

1.6.6 OUTDOOR PLAY

Outdoor play is multi-faceted (Pigott, 2012:8), but for the purpose of this study I refer to outdoor play as the play that the young child engages in outdoors, e.g. in the outdoor learning environment. Play in general can consist of freely chosen actions, devoid of grown-up interference, "characterized by fun, intense activity, spontaneity, freedom and self-initiative" (Wiltz & Fein in Prince, Allin, Sandseter, & Ärlemalm-Hagsér (2013:183). However it could include planned play through fluctuating amounts of adult direction too" (Prince et al., 2013:183). Frost (in Fikus and Luchs, 2013:206-207) defines play as "a play–work continuum" and typifies "play as active, spontaneous, fun, purposeless, self-initiated and serious". These same definitions describe outdoor play, and the outdoors provides occasions for the learners to be physically and practically more involved (Maynard et al., 2013:220) in their play experiences.

1.6.7 OUTDOOR LEARNING ENVIRONMENT

The following definition of the Danish forest school approach specifically defines a learning environment. As it stated that the learning environment can be indoors or outdoors, I include this definition to describe the outdoor learning environment.

"The learning environment includes the indoors and outdoors. It is the interactions between the pedagogical aims, the children and adults involved, and the physical space they are in that form the learning environment. The children's learning environment is seen holistically, and includes their physical, psychological and aesthetic wellbeing. The learning environment is an integral part of the Danish early years curriculum, and, as part of society's democratic beliefs, children must be included in evaluating their learning environments" (Williams-Siegfredsen, 2012:10-11). "In Denmark the term "learning environment" means wherever we are inside and outside. It is the interactions between the pedagogical goals, the participants (children and adults) and the physical space that construct a learning environment" (Williams-Siegfredsen, 2012:44).

"The outdoor learning environment, in contrast to the indoor learning environment, provides for more opportunities for the learners to apply themselves in their environment" (Maynard et al., 2013:220). Reference was made to the outdoor playground as the outdoor learning environment. The outdoor learning environment is therefore the area where the children play freely or where learning is facilitated outside the classroom on the school grounds, and it includes man-made and natural elements that children meet in their surroundings (Mayesky, 2006:617).

1.6.8 SCHOOL LEARNING READINESS

School learning readiness is the success that the learner will achieve in school (Van Zyl, 2004:147). "Readiness to learn can be described as the level of development at which an individual is ready to understand the learning of specific materials and is usually defined as the age at which the average group of individuals has a specific capacity" (Van Staden & Faber, 2004:176). There is a later edition of this book, but the definition does not appear in the later edition. Bruwer (2014:8) refers to school readiness as "the required state of personal school readiness of learners when entering the formal teaching environment in Grade 1, the readiness of the parents and the community to provide quality stimulation during the preschool years of the learner, as well as the readiness of the schools to support learners with insufficient school readiness in the Grade 1 classroom."

1.6.9 MINOR LEARNING DIFFICULTIES

Minor learning difficulties refer to learning difficulties among learners that can be overcome with the right stimulation and intervention. These are aspects such as lack of sensory or motor development that influence learning negatively. Bruwer (2014:9) refers to learning difficulties as "…the difficulties that Grade 1 learners encounter when they are confronted with the formal learning process which they are not ready for and struggling to cope with, due to insufficient school readiness." For this study, I exclude "learners with permanent physical and/or sensory impairments" (Bruwer, 2014:9).

1.7 RESEARCH DESIGN (PARADIGMATIC PERSPECTIVE)

The research design for this study is a case study. The "design" indicates the strategy that this research process followed (Bogdan & Biklen, 2003:49; Creswell et al., 2010:70). A blueprint of the research process to be followed was imperative for the accomplishment of my study, but as the researcher I had to keep in mind that changes would need to be made if the original circumstances changed (Burton & Bartlett, 2009:40). Therefore the research design was revised and improved as the research progressed.

Examples of these changes were the researcher's diary, which merged with the observation field notes to become only field notes; not enough diary entries were made, but extensive observation notes were documented. Another adjustment to the data collection technique was the substitution of site plans for an analysis of existing site plans. This was done because the existing site plans did not document the

necessary detailed information that was captured by my own site map of each outdoor learning environment. Design choices were therefore made all the way through the process (Bogdan & Biklen, 2003:50). Norris and Walker (2005:133) note that the design or strategy of a naturalistic investigation changes as the research develops. Fortunately, only some finer details of this study needed to be changed, and I was able to follow the overall design plan throughout the research process.

1.7.1 METATHEORETICAL ASSUMPTIONS

The process of understanding and the rationality of the world as experienced (Brown & Heggs, 2005:293) for this research study was placed in the qualitative, interpretivist paradigm. The fundamental research epistemology was accordingly interpretive in nature (Burton & Bartlet, 2009:18). The study was conducted inductively, as principles were structured from empirical data by means of theme analysis and by identifying the significance of the findings for the study (Somekh et al., 2005:346). The research description was inclusive in character, inferring that this study comprised the gathering of information about individuals and their social background by a variety of techniques (Somekh, Burman, Delamont, Meyer, Payne & Thorpe, 2005:1) discussed fully in Chapter 3 (see section 3.4 Data collection strategies p. 69). The intention of the research was not to generalise to the greater population (Creswell et al., 2007:294), but to increase understanding of the research subject; nevertheless, there could be transferability to some extent in particular circumstances.

1.7.2 RESEARCH METHODOLOGY

The methodology employed in this study comprised qualitative strategies due to the qualitative approach taken in the research. I made use of case studies (Bogdan & Biklen, 2003:55) to study how Grade R teachers design and use the outdoor learning environment for movement and sensory stimulation for the perceptual development of their learners. Table 1.1 (see p. 12) contains the data collection strategies chosen, the documentation method used and the data sources. Table 1.2 (see p. 14) documents how the data gathering techniques were employed to answer the research questions. In Chapter 3, I elaborate on the data gathering techniques in more detail (see section 3.4 Data collection strategies p. 69). The case study method was used because this research did not necessarily have to be applicable to South Africa as a whole and there was no clear indication that the results of the study would be the same for all pre-primary schools.

1.7.3 UNIT OF ANALYSIS

Pre-primary schools were the main focus in this study. Three sites were selected deliberately, because in qualitative data collection, purposive sampling is used so that individuals are selected who have experienced the central phenomenon (Creswell et al., 2010: 295). A small sample size was used, and the sample participants were selected according to a stratified, purposive sampling strategy. This meant that the participants were selected according to preselected criteria relevant to the research question (Creswell et al., 2010:79).

The criteria for selection were the design of the playground and the age of the children of the schools.

Therefore the sample consisted of:

- ✓ pre-primary or nursery schools with Grade R learners;
- ✓ pre-primary or nursery schools with qualified Grade R teachers;
- ✓ pre-primary or nursery schools with an outdoor playground that was of value to the study; and
- ✓ participants within the local Pretoria / Centurion area, as the researcher needed to visit the selected schools.

A brief description of the selected schools is given below.

1.7.3.1 School 1

School 1 is a long-established nursery school and is known for its excellence in education. The school caters for toddlers up to Grade R children. They have a unique playground with many different areas that were useful to this study. The teacher is a qualified Grade R teacher.

1.7.3.2 School 2

The second school is an inclusive mainstream pre-primary school catering for the ages three to six. It has an extensive outdoor playground providing a variety of play and learning opportunities. From the outset they strived to set new standards in school design and quality education. The Grade R teacher was furthering her qualifications with a BEd Honours degree and was quite knowledgeable about sensory and motor development.

1.7.3.3 School 3

School 3 is in an affluent area and had the means to enhance its playground. The extensive storeroom with various loose parts such as empty plastic bottles for play and different equipment to be rotated on the playground added value to the study. The Grade R teacher had more than twenty years of experience and had participated in the design of some of the playground elements.

1.7.4 DATA COLLECTION

Data gathering for this research was qualitative in nature, and therefore qualitative methods were followed. Research methods were chosen that fitted into the interpretivist paradigm. The accent of naturalistic enquiry is on the personal interaction with participants instead of distant forms of data collection (Norris & Walker, 2005:133). More naturalistic forms of data collection were preferred (Burton & Bartlett, 2009:21) for this study, such as face-to-face interviews. There is broad consensus that using several methods of data collection increases trustworthiness (Creswell et al., 2010:80). Unobtrusive data collection strategies were used, such as interviews and observations, photos, video clips and document analysis, which are dominant in the naturalist paradigm (Creswell et al., 2010:77). Interpretive studies also prefer methods such as informal interviews and observation, which allow the situation to be as "normal" as possible (Burton & Bartlett, 2009:21).

The answers to the research questions were not clear cut, and this was another reason why a qualitative study was chosen. It fitted the requirements of the research questions best in that it used data collection methods that best gather the appropriate data needed for a deeper understanding of the questions. "Case study design includes methods to collect both descriptive and explanatory data within a study" (Creswell et al., 2007:294). The validity and reliability of the findings were also checked by using multiple methods and doing cross-referencing; i.e., crystallisation was used to establish the validity of the findings.

The emphasis was therefore on collecting descriptive data (Bogdan & Biklen, 2003:50), as in-depth information was collected on how educators design and use outdoor learning environments for sensory and motor stimulation of the learners by applying a variety of data collection techniques over a sustained period of time (Creswell et al., 2010:293; Stark & Torrance, 2005:33; Burton & Bartlett, 2009:63). The actual settings of the pre-school case studies (Norris & Walker, 2005:133) were a direct source of data, and the researcher was the key instrument (Bogdan & Biklen, 2003:4).

The following table states the most appropriate data collection techniques for this research, how the data was documented and the source of the data.

Table 1.1: Data collection techniques

	Data collection technique	Documentation method	Data sources
1.	Individual semi- structured interviews	Audio recording, verbatim transcription	Teachers in the pre-schools
2.	Reviewing of site drawing	Notes on the observations made of the site drawings	Site drawings of outdoor learning environment
3.	Photography	Photographs	Outdoor learning environment sites and teachers interacting with learners
4.	Video clip recording	Video clips on CD	Teachers and learners in outdoor

	Data collection technique	Documentation method	Data sources
			learning environment
5.	Field notes	Researcher writes down notes during research session	Case studies
6.	Site inventory	Site inventory table	Inventory of outdoor learning environment
7.	Observation	Site visits and inventory, participant observation	Learners participating in outdoor activities directed by teachers or facilitators, free play and self-exploration. The playground site

In-depth interviews were conducted (Bogdan & Biklen, 2003:2) with Grade R teachers at each pre-school. Interviews focussed on the perceived sensory and motor development benefits of the outdoor playground for the Grade R learner. The semi-structured interviews with the teachers were conducted in order to gain information that had not been recorded yet.

Site drawings of outdoor learning environments provided more technical information regarding the design of an optimal outdoor learning environment. Photos of outdoor learning environments captured details of the use and design of the outdoor learning environments and video clips captured teachers using the outdoor learning environment to stimulate learners' motor and sensory development in these environments. These aspects were cleared in the ethical application.

Participant observation was done by observing how teachers employed the outdoor learning environment for perceptual development. How the children interacted with the outdoor learning environment was observed at the same time. Field notes provided extra information on observations while visiting the schools mentioned. Observation of children participating in outdoor activities directed by teachers or facilitators, or free play and self-exploration, provided valuable information on the use of outdoor learning environments.

The table below documents data for the secondary research questions which will assist me in answering the main research question. This table includes the research question, the data source, data collection technique, data documentation method and the purpose of the data for each question.

Table 1.2: Documenting data for secondary research questions

Secondary research question	Data source	Data collection technique	Data documentation method	Purpose (examples) of data
1. What is sensory and motor development and how does it take place?	Established research	Search accredited journals	Literature review, rubric	To gather already established information regarding the sensory and motor milestones.
	Grade R teachers in the case studies	Semi-structured interviews with teachers	Audio recording, verbatim transcription	Gather information and understanding from the teachers' knowledge and experience
2. What are the sensory and motor development milestones of the Grade R learner?	Established research	Search accredited journals, semi-structured interviews with teachers	Literature review, rubric	To gather already established information regarding the sensory and motor milestones. To gather information and understanding from the teachers' knowledge and experience
	Grade R teachers in the case studies	Individual semi-structured interviews	Audio recording, verbatim transcription	To gain insight from the teachers' perspectives and experiences
	Grade R children in the outdoor learning environment	Observation	Field notes, photos, video clips	To establish and document how children interact with environment in order to determine possible sensory and motor milestones
3. What constitutes a sensory and motor stimulating outdoor learning environment for the Grade R learner as regards its design and use?	Established research	Search accredited journals	Literature review, rubric	To gain existing knowledge on design and use
	Grade R teachers in the case studies	Individual semi-structured interviews	Audio recording, verbatim transcription	Gather information from teachers' expertise and experience on what they perceive to be a stimulating environment

Secondary research question	Data source	Data collection technique	Data documentation method	Purpose (examples) of data
		Observation	Feld notes, photos and video clips	To establish and document how teachers interact with the children and environment during activities directed by teachers or facilitators, and learners' free play and self-exploration.to determine possible sensory and motor stimulation
	Grade R children in the outdoor learning environment	Observation	Field notes, photos, video clips, rubric for sensory and motor situation on the outdoor playground	To establish and document how children interact with teachers and the environment during activities directed by teachers or facilitators, free play and self-exploration to determine possible sensory and motor stimulation
	Outdoor learning environment sites	Site drawings of case study sites	Notes on the observations made of design plans	Use the drawings to document the site
		Observation	Field notes, photos, video clips, site map, site inventory	Document the site and form opinions and establish further research needs about the site
4. How do educators employ the outdoor learning environment for sensory and motor development of the Grade R learner?	Existing research	Search accredited journals	Literature review, rubrics	Find out if there is existing research or supporting research on the topic
	Grade R learners	Observation	Field notes, photos, video clips, rubric for sensory and motor situation on the outdoor playground	To establish how the children use / interact with the site during free-play and self-directed activities
	Outdoor learning environment sites	Observation	Field notes, photos, video clips, site plan	To describe and document the site
		Site inventory	Site inventory table	To determine what the site contents are
	Teachers	Observation	Field notes, photos, video clips	To establish how the teachers use the site for learners' development and to see the interaction between teachers and learners

Secondary research question	Data source	Data collection technique	Data documentation method	Purpose (examples) of data
		Individual semi-structured interviews	Audio recording, verbatim transcription	To establish how teachers would design the site for development of learners if given the opportunity and to gather information from the teachers' experiences
5. How does sensory and motor stimulation impact on the Grade R learner's development and learning?	Established research	Search accredited journals	Literature review, rubric	To gather established information regarding the sensory and motor milestones.
	Teachers / facilitators of learning in the case studies	Individual semi-structured interviews	Audio recording, verbatim transcription	Gather information from teachers' expertise and experience on what they perceive to be a stimulating environment
		Observation	Field notes, photos, video clips	To establish and document how teachers interact with the children and environment during activities directed by teachers or facilitators, learners' free play and self-exploration.to determine possible sensory and motor stimulation
	Grade R children in the outdoor learning environment	Observation	Field notes, photos, video clips, rubric for sensory and motor situation on the outdoor playground	To establish and document how children interact with teachers and the environment during activities directed by teachers or facilitators, free play and self-exploration.to determine possible sensory and motor stimulation

1.7.5 DATA ANALYSIS

The initial step in the analysis of the qualitative data was to become immersed in the data in order to become familiar with the information. During this process all the collected data was examined, including field notes and interview transcripts, to form a clearer understanding of the information. The data was then encoded, conducting content analysis by looking for specific words for which themes and sub-themes were identified (Creswell et al., 2010:298). “Content analysis is a systematic approach to qualitative data analysis that identifies and summarizes message content. It is a process of looking at data from different angles with a view to identifying keys in the text that will help us to understand and interpret the raw data. Content analysis is an inductive and interactive process where similarities and differences are sought in text that would corroborate or disconfirm theory and used when analysing open-ended questions on interviews” (Creswell et al., 2007:101). Conclusions were drawn based on similarities and differences in responses and findings.

Qualitative data was interpreted together (triangulation) once all the data had been collected, captured, processed and the results had been condensed (Creswell et al., 2010:297). The analysis was done inductively (Bogdan & Biklen, 2003:50) which was more likely to help with identifying the multiple realities potentially present in the data (Creswell et al., 2007:37). Data analysis was an ongoing part of the research (Bogdan & Biklen, 2003:50). The data was analysed by looking at the data sets of interview transcripts, photos, video clips, site maps, site inventories, the whole-child development rubric, features of outdoor playground settings for the sensory and motor stimulation rubric of each pre-school in the study as well as the observation field notes for emerged themes. Thus “mechanically recorded materials” were looked over as a whole by myself as the researcher, and I made use of my understanding as the “key instrument for analysis" (Bogdan & Biklen, 2003:4).

1.8 ROLE OF THE RESEARCHER

The naturalistic emphasis of the study guided me to rather investigate theories of sensory and motor development in the outdoor learning environment *with* the Grade R teachers instead of *about* the Grade R teachers (Norris & Walker, 2005:133). The primary goal of the research was to acquire knowledge of the subject matter, not to pass judgment on a setting (Bogdan & Biklen, 2003:33). Therefore the three case study sites were not evaluated in terms of deficits, but in terms of the contributing elements of the design and use of these outdoor learning environments. This study was subjective; due to the nature of case study research, and views and my opinions played a part. My specific background was brought to the study (Bogdan & Biklen, 2003:50) as a nursery school owner and from a constructivist perspective, in the belief that reality is changing, whether I as the observer liked it or not, and that there are multiple realities that people have in their minds (Creswell et al., 2010:81).

The assumption that learners would benefit cognitively if teachers designed and used the outdoor learning environment for sensory and motor stimulation influenced the nature of the study, the findings and the recommendations. The assumption was discussed in more detail under section 1.2 earlier in this chapter, together with the rationale of the study.

1.9 QUALITY CRITERIA

I tried to assure the quality of the study by addressing its trustworthiness (section 3.6) and pointing out limitations that were encountered during the research process (section 5.5). The transferability of this study is limited because it is only relevant to the participants in this setting (Creswell et al., 2010:113), but due to the rich data collected, some aspects may be transferable. This is discussed in more detail in section 5.5.1 of Chapter 5 (see p. 191).

1.10 ETHICAL CONSIDERATIONS

The ethical principles of informed consent, confidentiality and privacy, honesty and openness, access to findings and avoiding harm (doing good) as described by Burton and Bartlett (2009: 32) were adhered to. This was done with regard to all participants, such as teachers, learners and their parents or guardians, at each school.

Informed consent was obtained from all participants involved in the study as well as from the University of Pretoria's ethics committee in the faculty the research was conducted in. Anonymity was explained and applied as agreed between participants and the researcher (Bogdan & Biklen, 2003:45). The research was open to participants (Burton & Bartlett, 2009:34) and interviews were recorded openly with the consent of the interviewees (Bogdan & Biklen, 2003:45). I also explained that withdrawal from the study was possible at any time.

Participants had the option to read the research report before publication. This also formed part of the validation process of this research and provided valuable feedback from participants on the findings and the research process as a whole. The research was conducted in a way that did not cause undue stress, harm or inconvenience to the respondents (Bogdan & Biklen, 2009: 34). The ethical implications of the methodology used in the research (Piper & Simons, 2005:59) were thought through, as were the positive or negative implications of this research for the participants and for the readers of the research findings (Bogdan & Biklen, 2003:45).

1.11 LIMITATIONS OF THE STUDY

Qualitative studies have strong points as well as flaws (Creswell et al., 2010:60; Burton & Bartlett, 2009:64; Bogdan & Biklen, 2003:60). Therefore there were some limitations to the study, and I tried to identify and manage these in the way deemed best for this research study.

Possible limitations:

- The case study might sometimes be restricted by time and activity (Creswell et al., 2010:294). Only three schools located in Pretoria were included in the study.
- Due to the interpretivist nature of the research, the researcher was subjectively involved in the study (Creswell et al., 2007:60).
- The greatest limitation of case studies, as explained by Bogdan and Biklen (2003:60), is that the findings cannot be generalised beyond the situation studied. Furthermore, most of the criticism levelled at the interpretivist paradigm concerns its subjectivity (Creswell et al., 2010:60).
- Perceptual development is a vast area of research and could not be covered fully in this limited study.

Methods I chose to deal with the above limitations:

- The research design met the requirements of the research question best in that it used data collection methods that best gathered the data appropriate for a deeper understanding of the question. These data collection methods allowed me to make sense of the participants' life worlds by interacting with them, appreciating and clarifying the meanings they ascribe to their experiences (Creswell et al., 2010:77). These methods were the best ways to get a better insight into the thoughts and feelings of the interviewees. Validity was checked by returning to the participants and asking them whether the conclusions drawn from their inputs matched their own views. In order to establish credibility and triangulation, a study was done to ascertain whether this research had been done elsewhere and, if so, whether it was compatible with the proposed research.
- A key strength of these case studies was the use of multiple sources and techniques in the data gathering process (Creswell et al., 2010:80). Multiple sources were used to make sure that data gathered was trustworthy and reliable. To ensure the integrity of the findings, the information collected from the interviews was cross-checked with the field notes and the data from the video clips, photos and observations. This method is known as crystallisation, and it validated results by making use of multiple methods of data collection and analysis (Burton & Bartlett, 2009:64; Creswell et al., 2010:60).
- The findings cannot be generalised, but transferability to cases similar to those in the research study may be possible. A metaphor often used in the social sciences is that a well-selected case constitutes the dewdrop in which the world is reflected (Creswell et al., 2010:76).
- More research must be done to establish how far-reaching the advantages of outdoor play are for perceptual development and to offer additional evidence.

1.12 OUTLINE OF THE CHAPTERS

CHAPTER 1: An overview of the enquiry

Chapter 1 provides an overview of the study, including the introduction, rationale, research problem and aims of the research. It also includes a historical overview of outdoor learning environments not discussed in the literature review in Chapter 2. The main concepts of the study are briefly described to give the reader a clearer understanding of discussions in the chapters to follow. The role of the researcher, ethical considerations, quality criteria and proposed limitations of the study are also discussed.

CHAPTER 2: Literature review

The second chapter critically synthesises and integrates the existing literature on the design and use of an outdoor learning environment for sensory and motor stimulation. The shortcomings in the literature are noted. The chapter also outlines the conceptual and theoretical framework that underpinned the research project.

CHAPTER 3: Data collection

Chapter 3 explains the paradigmatic perspectives of the research project and describes the research design chosen. The chapter describes the data collection strategies employed to gather all the data needed for the research and discusses the analysis techniques employed. Lastly, the trustworthiness and ethical considerations of the study are considered.

CHAPTER 4: Data analysis and results

The fourth chapter presents the data, an analysis of the data and the findings of the research project. The data is presented in themes and sub-themes. Inclusion and exclusion criteria for the data are given. The three different case studies are compared.

CHAPTER 5: Conclusions and recommendations

In this chapter literature control was applied to the results of the findings by looking at the similarities and contradictions between the literature and data, as well as any silences in the data or existing literature respectively. The findings are argued in relation to the existing literature in order to answer the research question. The contribution to the theory is discussed and the limitations and recommendations of the study are also presented

1.13 CONCLUDING COMMENTS

The early stimulation of cognitive development in the Grade R learner is of the utmost importance for formal school readiness and for later academic progress. The design and use of outdoor learning environments can stimulate the Grade R child's learning through either activities that the learner engages in or the motor movements that the learner makes in this environment. These impact on the learner's perceptual and cognitive development.

In this study the focus was on the outdoor learning environment of the Grade R learner, and more specifically on how this environment is designed, used and why it is used as such. The study assumes that if Grade R teachers are aware of and facilitate perceptual development on the outdoor playground through the use of sensory and motor stimulation, the environment will be positive for the cognitive development of the learner. This will improve school readiness and also decrease minor learning difficulties. The research project investigated what the general literature and the research literature said about these aspects. Case studies of three pre-primary schools were undertaken.

The contribution of this study is that it adds to the limited research done on the design and use of the outdoor learning environment for Grade R learners in South Africa to enhance perceptual development. Motor stimulation was investigated in combination with sensory stimulation, as it was found that these two aspects are mostly researched in isolation. Therefore the study contributed to a more integrated context for learning in the outdoor learning environment, which has not been addressed sufficiently in the research literature. The purpose of this study was to make useful recommendations that will help teachers understand how an outdoor learning environment could be structured to enhance perceptual development. The research was specifically done from the perspective of an educator in the South African context.

In the next chapter, I critically synthesise and integrate more recent studies about the design and use of an outdoor learning environment for sensory and motor stimulation, using a combination of printed and electronic sources of national and international research as well as some general literature (Jansen, 2008). These studies relate to perceptual and cognitive development. I examine the shortcomings in the existing literature regarding my research topic and explain how this research study will attend to the identified gaps or limitations in the current knowledge base (Jansen, 2008). I do this in order to place my research, done in Pretoria, South African, in a framework within which to view the study in relation to other reputable research and to configure guiding principles for learning environment designs. My findings are therefore built on and complement existing research and are validated by the findings of the case studies used for this research study.

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CHAPTER 2: LITERATURE REVIEW

An enquiry of established research on sensory and motor stimulation on the outdoor playground

2.1 INTRODUCTION

There is much interest in the field of outdoor learning environments, outdoor playgrounds and the role of play in physical and cognitive development, among others (White, 2008:2, 3; Wilson, 2008:47; Tovey, 2007:32; Bullard, 2010:330; Greenman, 2007:283; Wellhousen, 2002:23,30; Fikus & Luchs, 2013:207; Ghafouri, 2014:69). A review of the relevant literature revealed an increase in articles, research studies, reports and conferences in the past 20 years and beyond, highlighting the importance of pre-primary stimulation for perceptual development and school readiness (Erasmus et al., 2011:46; Perry, 2010:iii; White, 2008:2,3). The importance of outdoor learning experiences for perceptual development is very prominent in research across disciplines such as education (Erasmus et al., 2011:46) and educational psychology (Thelen, 2001:161; Merzenich, 2001:68; Postner, 2001:387), occupational therapy (Berkley, 2009:208) and landscape architecture (Woolley & Lowe, 2012; Pigott, 2012:1,2). Collecting information across these varied disciplines placed the research in a holistic framework from which to view the study.

Although there is extensive literature about outdoor playgrounds for young children, the bulk of this literature focuses on the child's motor skills. Considerably less information was found about developing learning opportunities for the development of all the senses, not only the five senses that are commonly known, on the playground. Little research relating to Grade R learners has been done in this field in South Africa. I position the research in this noticeable silence and structure the review to give an educator's understanding of the topic as explored in Pretoria.

2.2 THE OUTDOOR LEARNING ENVIRONMENT

2.2.1 PERSPECTIVES ON OUTDOOR LEARNING ENVIRONMENTS

There are several perspectives on what an outdoor learning environment could be defined as. It is worth noting two main kinds of outdoor playgrounds as discussed in this study, one being the traditional playground (KFC – kit, fence and turf), and the other being nature or the "natural" playground (Pigott, 2012:9; Fikus & Luchs, 2013:207,208; Hamarstrom, 2012:1). According to Pigott (2012:9), playgrounds in America consist mostly of the traditional model, where focus is on gross motor skills stimulation and on minimising the level of risk that children encounter during their play. These playgrounds typically consist of homogenised parts and equipment that offer very little prospect for discovery because of their preset

functions. Such a playground generally consists of a sandpit, swings, a climbing structure, a see-saw and a bicycle track and do not aid holistic development.

In South Africa, most playgrounds resemble reproductions of the traditional prototype that Pigott describes in her study and offer limited sensory and fine motor stimulation. In a study by Van Heerden (2012:163), where she selected 213 early learning centres across South Africa, she found that 95% of the centres in her study had swings, climbing apparatus and a slide, 65% a sandpit, blocks, fantasy play, wheel toys and water play, 50% had a dollhouse and art outside and only 22% a sensopathic area (an area where children engage in sensory play), animals, woodwork and a vegetable and/or herb garden (the latter features were generally lacking in the early learning centres).

A “natural” or “naturalised” playground has more natural features than manufactured apparatus (Hamarstrom, 2012:1) and fosters the use of the natural landscape, encouraging the use of ecological features for play. Greenman (2003:76) refers to these natural playgrounds as “environmental play yards”. These playgrounds offer learners the chance to interact with their natural surrounds containing water and fauna and flora and come into contact with life cycles and the interconnectedness of their environment. The constituents of these types of playgrounds vary, but include ecological features such as “water, plants, flowers, hills, tree groves, weather stations, rock outcrops and streambeds” and could also contain more traditional fabricated equipment such as swings, multi-level constructs or climbing equipment (White in Hamarstrom, 2012:1). For the purpose of this study, I have given a brief description of natural playgrounds above, but it must be noted that there are different perceptions of “natural playgrounds”, and I agree with Fikus and Luchs (2013:206) that this topic should be studied more closely.

Mayesky (2006:617) noted that in the phrase “outdoor learning environment” the word “environment” refers to two things, namely man-made things as well as natural things that children encounter in their surroundings. Meier and Marais (2007: 25) add that although children are born with the potential to learn, their environment significantly affects their development because they gain knowledge from it. I assume then that the outdoor playground of a pre-primary schools, preschools and nursery schools can play a vital role in the development of Grade R learners by including natural and man-made features and not simply the one or the other. It is this combination that is referred to in this study as the outdoor learning environment.

2.2.2 THE FUNCTION OF THE OUTDOOR LEARNING ENVIRONMENT

It is important to know the influence of diverse playground models and the prospects they offer for play behaviour of learners in these settings (Fikus & Luchs, 2013:208,209). The function of the outdoor learning environment, however, varies according to the lens it is viewed through. The lens of belief for this study is that the outdoor learning environment has tremendous opportunities for learning and holistic child development. On the other hand, there is a common notion that the purpose of a playground is

simply to get rid of children's unwanted or unused energy before they return to the classroom, where the learning will take place. This notion is revealed in the way playgrounds are created and used (Greenman, 2003:75). My experience is that this mindset robs children not only of the opportunity to put their energy to proper use, but also of the incredible opportunities for holistic – cognitive, physical, social and emotional – development outdoors. There is so much more to the outdoor learning environment than simply getting rid of unwanted energy, getting a bit of fresh air and exercise. Child development and outdoor play are multi-faceted (Pigott, 2012:8), and the outdoor learning environment should therefore create complex sensory and motor affordances for the young child.

Moore and Wong (1997:133) describe the outdoor learning environment as offering "a unique sense of exploration and discovery and a powerful impetus" for learning. Frost, Wortham and Reifel (2012:297) advocate the view of play settings as spaces that support and inspire, that allow for configurations of play, encourage communication between learners, and provide contact with nature and present opportunities for children to use materials. Pigott (2012:114) further states that play settings must encourage "physical activity, creativity, curiosity, learning through play and prolonged outdoor activity." Clearly, the outdoor learning environment has enormous potential for not only sensory and motor stimulation, but for holistic child development. Although these types of playgrounds are getting more and more credit internationally (Hamarstrom, 2012:1), the outdoor learning environment is still being underutilised in South Africa.

2.2.3 THE OUTDOOR LEARNING ENVIRONMENT AS AN EDUCATIONAL RESOURCE

Possibly one of the factors contributing most to the development of the young learner is the education they experience in early childhood (Ernst, 2013:14). Encounters with natural spaces in the outdoor learning environment can play a positive role in this process (Davies; Cosco; Blanchet-Cohen & Elliot in Gehris, Gooze, & Whitaker, 2014:8), also for the child with learning barriers (Stoneham,1996:11). Stoneham (1996:11) emphasised that school playgrounds are a widely acknowledged resource for learning. In these "rich natural landscapes", children have countless opportunities not only to gain knowledge, but to develop holistically (Pigott, 2012:2).

2.2.3.1 The importance of an enriched environment

Children who are fortunate enough to have enjoyed a wide variety of interesting and enjoyable early learning experiences and who have participated in a stimulating pre-primary school programme have a distinct advantage over children that have grown up in an environment where the extent, range and variety of their experiences were limited. Lack of early stimulation usually provides insufficient opportunity to help children develop to their fullest potential, even though they may be intellectually normal and able to learn (Maree & Ford, 1995:13). These children depend solely on the school environment to help them overcome their lack of early learning experiences.

Unfortunately, many children have had limited experience of exploring their environment, and this has major implications for the development of mobility skills (Stoneham, 1996:8), as "the environment" that children are raised in has a major influence on the growth of their motor skills (Lejarrage et al. in Pienaar and Kemp, 2014:169). They may be withdrawn and apprehensive when facing unfamiliar challenges. School grounds can help by providing motivation, stimulation, encouragement and experience (Stoneham, 1996:8). Unfortunately, what stood out in Stoneham's research is that despite the benefits of an enriched environment, it was clear that numerous playgrounds only accommodate limited scope for "outdoor use" and consequently fail to satisfy the "diverse needs of all children, perhaps especially those with special needs" (Stoneham, 1996:6), which is confirmed by Van Heerden's study (2012:163) in South Africa.

2.2.3.2 Outdoor learning experiences versus indoor learning experiences

Eaton (in Dillon, Rickinson, Teamey, Morris, Choi, Sanders and Benefield, 2006:107), found that outdoor learning experiences were more effective in developing cognitive skills than classroom-based learning. Such comparative studies, though important, are rare and very difficult to carry out (Dillon et al., 2006:107). In sections of Europe, Forest kindergartens, where young learners spend almost the whole day in natural outdoor settings, have existed for 50 years and more; yet there is an absence of exact evaluations "of children's learning in these environments compared with more traditional indoor settings" (Knight in Gehris, Gooze & Whitaker, 2014:8).

Young learners will engage with nature and the outdoor learning environment with amazement and interest if they are afforded the opportunity and directed wisely (Pigott, 2012:15). The "natural world" is unlike the environment learners encounter indoors; there is room for a broader scope for endeavours. Outdoors learners are at liberty to move about and discover bigger areas, while becoming familiar with the day-to-day transformations of the outdoors in a tranquil setting. Space affords learners the opportunity to move physically by means not possible indoors: "they can run, jump, tumble, and climb". They are allowed to be "louder, wilder, and more expressive" outside. The outdoor learning environment is vibrant, continuously stirring and transforming, and this creates infinite prospects for creative and collaborative play and occasions to comprehend and appreciate nature (Pigott, 2012:14). "The physical interaction with the elements, the seasons and the natural world, the range of perspectives, sensations and environments – multi-dimensional and multi-sensory – and the daily change, uncertainty, surprise and excitement all contribute to the desire of young children to be outside" (Richardson, 2006:8).

A more recent study by Maynard, Waters and Clement (2013:221) found that the Foundation Phase teachers claimed that learners' failure to achieve in the classroom decreased in the outdoor learning environment. What stood out for me in this research was that the teachers commented on the connection between "children's engagement in child-initiated learning and features of the outdoor environment" as contributing to a decrease in underachievement. One of the concluding findings of the study was that

more natural outdoor learning environments appeared to "support and amplify the effects of child-initiated learning and to diminish (the perception of) underachievement" (Maynard et al., 2013:223).

Another aspect found in the literature was the infusion of learning into outdoor play. Many teachers working in early childhood settings want to make the outdoor playground an extension of the indoor classroom (Wellhousen, 2002:23). There should be no strict division between indoor and outdoor space, and it should be possible to use both spaces simultaneously (Nursery School Association of South Africa, 1972 in Verster, 1992:182). This is in harmony with the way Montessori arranged her classrooms. She was the forerunner of the "open classroom" movement (Verster, 1992:182). However, the need for effective follow-up work after outdoor experiences is emphasised, as there need to be clear links between outdoor and indoor activities (Dillon et al., 2006:107). It was also found in the literature that inactive behaviours are common in school situations where teachers devote very little time to outside play because they concentrate on perceived attainment of scholastic "success" to be achieved indoors (Reilly in Pigott, 2012:6). This could be because teachers do not link "natural outdoor settings with learning". The associations that teachers have with the outdoor learning environment have a great influence on how these teachers employ the outdoor playground. It could be that the teachers do not provide adequate learning encounters for children outdoors because they do not see natural features or free play in natural surroundings to have educational significance (Ernst, 2013:4).

2.2.3.3 Enquiry-based learning in the outdoor learning environment

When searching the existing literature, I came across the terms "free-choice learning" (Ghafouri, 2014:57), "self-directed" learning (Prince, Allin, Sandseter & Ärlemalm-Hagsér 2013:186) and "child-initiated learning" (Maynard et al., 2013:212). As explained in Chapter 1, I discuss these concepts under the umbrella term of enquiry-based learning.

When children are self-directed in their activities, a higher level of learning takes place than when learning is teacher directed. "Free-choice learning" as entire successions of intricate procedures knitted together and entwined with the rest of the body (Falk & Dierking, 2002:35), is not simply "a product" stockpiled in the mind" (Ghafouri, 2014:57). "Free-choice learning" entails a "choice over what, why, where, when, and how we will learn" because it is 'self-directed, voluntary, and guided by individual needs and interests' (Falk & Dierking in Ghafouri, 2014:57). This is in line with the outdoor learning environment and is discussed in more detail under the section of cognitive development. Waite, Rogers and Evans (in Prince, Allin, Sandseter and Ärlemalm-Hagsér, 2013:186) explored outdoor play in England and found that outdoor learning environments in a natural setting enable more "self-directed" learning. Likewise, the research done by Maynard et al. (2013:220) emphasised that "children's engagement in child-initiated learning and features of the outdoor environment" provides "opportunities for more practical, hands-on, problem-solving activities". This increases sensory and motor stimulation as

part of the learning and relates to the model of Slabbert et al. (2009:118) of and for the facilitation of learning in the theoretical framework as regards authentic learning.

There is much support for enquiry-based learning outdoors – not only in many research projects across the world, but also in education departments of countries such as Denmark (Knight in Gehris, Gooze & Whitaker, 2014:8), Australia and Norway (Sandseter, Little & Wyver, 2012:176), Wales (Maynard et al., 2013:212) and South Africa, amongst many others. The Reggio Emilia (Ghafouri, 2014:58), Montessori (Feez, 2011:48) and Forest School philosophies all support enquiry-based learning, although the ways of implementing it differ widely. The Foundation Phase for Wales, for example, advocates an experiential, play-based approach to learning for children aged three to seven years that includes child-initiated activity within the outdoor environment (Maynard et al., 2013:212).

Interestingly, teachers in the study by Maynard et al. (2013:212), reported that “children perceived to be ‘underachieving’ within the classroom came into their own when engaged in child-initiated learning outdoors”. It was therefore assumed that more natural outdoor learning settings “in which child-initiated activity took place appeared to amplify the effects of child-initiated learning and diminish the perception of underachievement” (Maynard et al., 2013:212). “Learning is a series of non-isolated and related processes which is situated in all aspects of our life. It is dynamic and does not stop in a moment or place; rather, learners play an active role in interpreting, constructing and reconstructing knowledge of their world based on their prior experiences” (Anderson; Medved & Oatley in Ghafouri, 2014:57). Enquiry-based learning forms part of how sensory and motor stimulation takes place in the natural outdoor learning environment. The constructivist assumption is made that "when children are exploring, experimenting, making their own discoveries, as they are innately impelled to do, then their natural structures are growing and connecting. These physical structures are the new higher-level knowledge and skills they are acquiring” (Smilkstein, 2003:73). "Experience emerges out of the complex interplay between the four vital constituents of our nature – body, mind, soul and spirit – while in constant dynamic interaction with the environment” (Dimitrov & Wilson, 2002 in Slabbert et al., 2009:73). Learners are therefore also active participants in their own development, and the environment does not simply impact on them (Swanepoel & Engelbrecht, 2010:22). Enquiry-based learning also directly links with the model of Slabbert in Figure 2.2, which is used in the theoretical framework discussed later in this chapter.

2.2.4 THE ROLE OF NATURE IN THE OUTDOOR LEARNING ENVIRONMENT

There are many aspects to the presence of nature in the outdoor learning environment, such as the benefits of being in nature, connecting with and being aware of nature, nature and development, natural versus traditional playgrounds and how play is influenced by nature. I discuss these aspects in more detail below.

2.2.4.1 Benefits of being in nature

"…[n]ature is a powerful, healing, energizing, and inspiring force that has many positive effects on children" (Pigott, 2012:97).

Ernst (2013:5) points out that the benefits of nature can be seen by looking at the results of a lack of affordances with nature. He cites varies studies verifying that there are negative impacts on development when there is an "absence of nature experiences", such as reduced motor abilities (Bartlett; Hüttenmoser in Ernst, 2013:5). Resonating with the assumption of this study, Elliot (in Ernst, 2013:5) says that child development beliefs suggest that learning takes place when children are engaged in their environments by active sensory and motor involvement. The abundant sensory stimuli that nature affords and the prospects for sensory integration are vital for early childhood development (Sebba, 1991 in Smilkstein, 2003:76; Wilson in Ernst, 2013:5).

2.2.4.2 Natural environments versus traditional playgrounds

Different environments cause different patterns of behaviour among young learners and affect the opportunities of these children to engage with the environment. Nature has a profound influence on various types of development and children's interest in play activities.

(a) Natural elements encourage varied types of development

Natural outdoor learning environments offer more opportunities for sensory and motor stimulation and enhance child development in general. Herrington and Studtmann (in Fikus and Luchs, 2013:208) document at length that "the introduction of different natural landscape elements on the playgrounds could encourage different and varied types of development". The study of Pigott (2012:1) echoes this view, suggesting that children have a developmental advantage and enjoy better health when they increase the amount of time they spend outside.

There are specific benefits to sensory and motor development in the natural outdoor learning environment. Traditional playgrounds attract less physical (somatic) pursuits than playgrounds incorporating natural surroundings (Boldermann et al.; Fjørtoft; Fjørtoft & Sageie in Fikus & Luchs, 2013:208) and therefore "pre-school children develop better motor abilities when playing in nature compared with traditional playgrounds" (Fjørtoft, 2000 in Prince et al., 2013:184; Fikus & Luchs, 2013:208). When learners spend time on natural playgrounds, gross motor and other basic abilities such as "running, jumping, throwing, climbing, crawling, rolling, swinging and sliding" prevail relative to the traditional counterpart (Fjørtoft, 2000 in Prince et al., 2013:184). "Climbing and sliding" actions are stimulated by the natural topography such as trees, steep inclines and uneven rock faces (Prince et al., 2013:184). Children need to experience much natural sensory stimulation, such as playing in a garden instead of artificial play settings. These artificial play settings do not offer the richness of sensory stimuli

that playing in nature offers. These encounters also encourage and stimulate sensory integration. An example would be the benefits to sensory integration of walking on an uneven footpath, in contrast to the usual level, constructed surfaces that reduce prospects for sensory integration (Sebba, 1991 in Smilkstein, 2003:76).

Beams and Brown (2014:129) state that "outdoor education" has an extensive history of expressing a different way to the prevailing methods of using playgrounds, "a way of embracing opportunities for embodied and holistic approaches to learning". What stood out for me in their research was the view that it would be a disgrace if these prospects vanished due to thoughtless approval of modern practices. Without our realising it, these steal the chance of facilitators and learners to be impulsive and to enjoy unexpected education prospects frequently encountered in open-air surroundings, where all is not foreseeable and quantifiable. They refer to the rationalised processes brought on by the consumer culture that influences playgrounds and playground equipment. "It is vital that we carry on to afford prospects for our learners to learn for themselves the worth and gratification of education in the open-air via the establishment of proficiencies that arrest their resourcefulness, need their action and participation, and which demand creativity, buoyancy and dynamic social responsibility" (Beams & Brown, 2014:129).

(b) Nature's influence on play episodes

Many studies examine the influence nature has on the way children play and interact with the environment (Prince et al., 2013:184; Fikus & Luchs, 2013:206). A study done in Bremen, Germany by Fikus and Luchs (2013:206), measured up "active play" of children between five and six years in traditional play environments versus "natural" play environments by design and configuration. The purpose was to discover how varied play settings inspire different manners of play. They found that the types of play that children engaged in differed significantly in the different environments and that children in the natural play environment played much longer, showing an increased interest and concentration level because they were more engaged in their play. This was not the case in the traditional play environment.

In fact, according to Fjørtoft (2000) in Prince et al., (2013:184) young children of pre-school age find traditional play areas uninteresting and tiresome in comparison with "natural playscapes" (Prince et al., 2013:184). This is not surprising, as it was evident in the study done by Fikus and Luchs (2013:218) that "children on contemporary playgrounds spend a lot of time waiting in queues, an aspect we have not even seen once in the counterpart" (Fikus & Luchs, 2013:218). Lee (in Prince et al., 2013:184) affirms this, as it was also found that "children reacted to natural playgrounds enthusiastically and actively and that these afforded the most challenging play when comparing children's play in traditional-equipment play areas, contemporary-designed playgrounds and natural-design playgrounds." Fikus and Luchs (2013:217) also note that "children do not show as much development and fantasy within one play episode due to a less affording environment" on the contemporary playground. Blinkert et al. and

Nicholson (in Prince et al., 2013:184) note in contrast that "the (natural) environment affords more creativity by offering loose parts and a changeable environment that does not only define one single function". This offers great sensory stimulation as well as fine motor skills development.

2.2.4.3 Outdoor play

There is extensive awareness of the influence and effect of play on the young child, yet the opportunities are becoming fewer and fewer regarding "time and place for uninterrupted free play and open-ended play in everyday life" (Fikus & Luchs, 2013:206,207). The character and quality of youngsters' play in the Western world has altered dramatically over the past years (Brussoni, Olsen, Pike, & Sleet, 2012 in Prince et al., 2013:183). For this study, play forms part of the "when" in the conceptual framework.

There are many definitions and classifications of play, but for the purpose of this study I will highlight key aspects that I found in the literature that best describe the focus of play. The view and idea of play is quite vague and indefinite regarding children's individual actions. For a start, it is an intentional, deliberate, inherently inspired encounter where the action itself is more significant than the result (Bateson, 2005; Sutton-Smith, 1997 in Prince et al., 2013: 183). Play can consist of freely chosen actions, devoid of grown-up interference, "characterized by fun, intense activity, spontaneity, freedom and self-initiative" (Wiltz & Fein, 2006 in Prince et al., 2013:183). However, it could include planned play through varying adult direction too (Prince et al., 2013:183).

(a) Development and learning as a result of play

"Young children learn and develop through play" (Pigott, 2012:115; Davin & Van Staden, 2005:6; Undiyaundeye, 2013: 514). The effects of play on the young child's development and learning are widely recognised (Fikus & Luchs, 2013:213). No other interval in the young child's life includes such extensive play as do the years two to six. Throughout this phase, play is the key influence on their development (Vygotsky; Frost, Wortham, & Reifel, 2012 in Pigott, 2012:6). Undiyaundeye (2013) did a study in Nigeria on how children learn through play. In her study, she observed that young children want to instinctively discover and achieve their objectives, and play empowers them to develop perception of their environment to achieve this. Play develops cognition, among other abilities, as it transforms young children's capabilities and allows them to gain confidence to take part in new encounters within new surroundings, significantly influencing their development and learning. Play is not squandered time, but time expended to gain more understanding from prior encounters (Undiyaundeye, 2013:514). "Free play provides a motivating force in the learning process. Springing from within, in response to freely discovered external stimuli, play is a natural universal endowment of young humans, as it is in many other species. Free play arouses children's innate curiosity, motivating them to actively learn" (Moore & Wong 1997:195; Pigott, 2012:16).

Outdoor play facilitates the improvement of perceptual capabilities "such as depth, form, shape, size and movement perception" (Fiskum, 2004; Rakison, 2005 in Prince et al., 2013:184) and overall "spatial orientation" (Bjorklund & Pellegrini, 2002 in Prince et al., 2013:184,185). Outdoor play affords practice and development of diverse motor and physical (somatic) abilities (Fjørtoft, 2000; Grahn, Mårtensson, Lindblad, Nilsson, & Ekman, 1997; Vigsø & Nielsen, 2006 in Prince et al., 2013:184). The Reggio Emilia (Ghafouri, 2014:58), Montessori and Danish Forest School (Feez, 2011:48) philosophy values play as a learning context and as part of naturalistic enquiry. It is worth noting that the "most complex forms of play as well as long-lasting play" experiences originate in natural play spaces (Waller et al. in Fikus & Luchs, 2013:218).

(b) Educational objectives for outdoor play

Children's physical condition is weakening, and as a result more and more children have inadequate motor abilities (Pedersen & Brodersen, 2008; The Danish National Board of Health, 2010; World Health Organization, 2007); this is most likely due to insufficient sensory experiences, causing even further learning difficulties (Ayres, 1979). For this reason young learners must physically exert themselves outdoors as much as possible from a very young age (Ayres, 1979 in Refshauge, Stigsdotter, Lamm, & Thorleifsdottir, 2013:1). Outdoor learning environments can provide the opportunities for these experiences. Pigott (2012:98) suggest that children must have a variety of significant settings that invite them to engage with their surroundings on a daily basis. These settings must include places where children can be active and loud or play in a group as well as settings for silent or solitary time where fine motor skills can be improved.

Variety in outdoor play area topographies encourages and intensifies physically vigorous activities (Fjørtoft, 2000). Barbour noted that children's interaction with resources and tools in the physical setting constructively affects the motor proficiency of young children. Expansive kindergarten settings with varied environmental features spark physical movement and development (Boldermann et al.; Fjørtoft; Ozdemir & Yilmaz in Fikus & Luchs, 2013:207). In Addendum 1, a table found in Woolley and Lowe (2012:58) provides an insightful summary of the connection between play and a natural outdoor setting. I found this table valuable in this regard, but could not include it here due to space restrictions.

❖ The importance of outdoor risk for development

If an outdoor learning environment is truly designed according to the findings of the above studies, there is a significant risk of injuries involved. According to Çorakçi (2010:1), many school grounds have green areas, but for safety reasons these are not accessible to children; and it is precisely the engagement with these green areas that is needed for sensory and motor stimulation. Many research reports and journals mention the great fear of risk on the playground and that all risk should be avoided by adhering to strict safety standards. As the perception that risk is negative has a great impact on planning for outdoor

learning settings, I briefly look at the risk inherent in these environments to establish its influence on design as well as to put risk into perspective with benefits.

Niehues et al. (2013:223) say that risk can be viewed positively in the light of the role that challenging experiences play in learners' development. Niehues explains that children need to encounter unfamiliar and difficult situations in order to feel self-sufficient and capable to face new situations. Even if they don't achieve success, they learn from these experiences to deal with uncertainty. Children must test their own capabilities, improve their physical abilities and build endurance for cognitive tasks (Niehues et al., 2013:223,224). Challenging experiences are therefore an important part of developmentally appropriate motor and sensory stimulation.

Lester and Maudsley (2007) in Ernst (2013:3,4) note that the specifications that pre-primary schools generally have to adhere to for endorsement "would likely guide early childhood education programs striving for accreditation away from the kinds of settings and surfaces most conducive to nature play: diverse ground cover (rocks, stones, sand, mud, water, grass), open and secluded spaces, loose parts that can be manipulated by children, and the possibility of chance events". Yet it is important to take risks in movement, because "the child who is granted the opportunity and is in a position to control and co-ordinate his movements, is prepared to venture and to explore. It is this child who takes on the unknown with more daring and discovers knew knowledge. If the child has a physical and movement advantage, he experiences himself positively with respect to other children. A positive self-image is a guarantee that the child will also actualize his other potentialities" (De Witt & Booysen, 1995:66). Therefore we see that one of the functions of an outdoor learning environment is to provide an environment where children can encounter risk in order to develop into healthy, happy and resilient people.

2.2.5 THE LAYOUT OF THE OUTDOOR LEARNING ENVIRONMENT

Playgrounds vary in design and features, but for the purpose of this study I refer to the layout of the outdoor learning environment as having more natural design elements and settings, as I assume that these have a greater benefit for the development of the young learner.

2.2.5.1 Outdoor learning environment design

Young learners come to know and grow holistically through play, as discussed in the section on outdoor play. Thoughtfully planned outdoor play areas which children can fully utilise are essential for them to develop into joyful, fit and innovative participants in the world around them (Pigott, 2012: 115). There are quite a few studies that inform playground design and that "verify the powerful relation concerning formations of topography and types of play" (Fjørtoft in Fikus & Luchs, 2013:208). Fikus and Luchs (2013:207) note "a positive influence of playgrounds and playground features on the play activities of children". Refshauge, Stigsdotter, Lamm and Thorleifsdottir (2013:1) add that "…playgrounds are

valuable places that support healthy child development by providing opportunities for play, nature exploration and sensory stimulation".

It is expected these days that playground design choices will be based on established research. Educational objectives for outdoor play need to be studied when designing a natural outdoor learning environment. Therefore one needs to keep in mind that "…non natural and manmade features and elements of each outdoor play environment attracted predictable, limited, and repetitious patterns and types of play" (Moore and Wong 1997). In contrast, "natural areas tend to attract a larger variety of play" (Pigott, 2012:97). The section on broad objectives for young children's development must be considered when designing an outdoor learning environment because it is vital to know how to structure the environment to enhance "children's physical, cognitive, social, and emotional development" (Cardon et al., 2008 in Pigott, 2012:6). The design features of schoolyards determine the way children behave, learn, play and interact with others (Moore & Wong). In a bland and largely tarmac yard, even a very active child will find it difficult to be creative and willing to participate in play. The yard should provide a diversity of places and "habitats" for different age and gender groups, so that children will have the opportunity to interact with others and to be creative (Titman, 1994). Affordances of diverse landscape elements, and especially loose parts for play in natural environments, influence play activities (Fikus & Luchs, 2013:206). Green school grounds promote more vigorous activity, which increases the health benefits of this exercise (Bell & Dyment, 2008 in Çorakçi, 2010:1).

Frost (1992) recommends four principles for designing outdoor spaces to stimulate the senses. Look first to nature to provide a variety of experiences to stimulate the senses, such as wind-blown chimes, light filtering through trees and surfaces of different textures – grass, sand, water, leaves, bark and rocks. When these elements are not present, substitute soft music, erect an overhead lattice cover and create or purchase texture panels. These panels consist of objects with various textures and appearance, secured to a smooth backboard made of plastic or wood protected with a weather resistant coating such as lacquer or varnish. Also offer novelty, variety and challenge in the experiences provided for the children (Wellhousen, 2002:33). Hiatt (2012:52, 53) also noted design criteria that recognised that "the playscape should include elements the child can manipulate, contain living things, be sensitive to climate, be designed to the scale of the child, and include areas for play in groups or alone. Each one of these guiding principles helps to create an environment that supports free play, a key component to the outdoor classroom and holistic child development".

According to Pigott (2012:107), the playground should include "pathways to encourage movement through the environment and to different areas. Paths should be interesting, and more complex shapes than simple loops should be included". Water is a very important component of the outdoor learning environment and always fascinates children. "Water and sand play settings can be combined or separate. Play structures are important for the development of gross motor skills and the setting they create for

dramatic play. Children can test their limits on play structures, taking healthy risks. Structures give children the opportunity to climb, swing, and jump; which helps them gain balance, strength, and confidence" (Pigott, 2012:108). Wood can be used for these play structures, so that the structure does not disrupt the natural feel of the outdoor setting. If topography does not provide the affordances needed for sensory and motor stimulation, then it could be beneficial to have structures that promote these. "A swing's rhythmic oscillations are linked to the stimulation of the vestibular senses, causing a feeling of excitement in children" (Ayres, 1979 in Refshauge, Stigsdotter, Lamm, & Thorleifsdottir, 2013:16).

Another way of adding to the learning opportunities in the outdoor learning environment is by attracting insects and birds with "the use of bird houses, bird feeders, bat houses, and flowering plants that attract birds and butterflies" (Pigott, 2012:109). "Sensory gardens can be used to benefit children's developing senses. Incorporating a variety of vegetation benefits children's senses. Plants exhibiting a variety of size and structure can provide visual stimulation. Herbs can be used for smelling and tasting. Tall grasses and other plants can be used to create sound when the wind blows through them. Plants can be used to exhibit fuzzy, spiky, smooth, and rough textures. Vegetable gardens can be used to teach children about food systems, and how to tend to growing edible plants. Children can grow fruits, vegetables, and herbs with the help of a teacher" (Pigott, 2012:110). The perimeter of the outdoor learning environment also affords opportunities to form hidden, smaller settings with the use of plants. Children must also have a view of the outside surrounds beyond the fence by incorporating aspects such as viewing portals. Designers must therefore plan to make the fence an interesting part of the outdoor setting (Pigott, 2012:110,111).

The environment could further contain a combination of man-made and natural elements, because these afford diverse learning opportunities for the pre-school child. "Nature can enhance a standard playground, just as gross motor skill play equipment can enhance a natural playscape. Broadening the understanding of what playgrounds are will allow educators and designers to utilize these outdoor areas more effectively" (Pigott, 2012:111). "The intention and design of a play space affects the ways that children use it. If a playground is designed to be used as a setting for brief physical play, and that is the way the teachers structure their curriculum, then the children will use it in that way. However, if a playground is seen more as a landscape for learning, and the teachers incorporate it into their curriculum for different subjects, then it will have a broader variety of uses and benefits" (Pigott, 2012:13). Dyment, Bell and Lucas (2009) "found that it was important to ensure a great diversity of design features and green (nature) elements in school grounds to promote children's physical active play, and especially to enhance activities for girls" (Prince et al., 2013:184). According to Gehris, Gooze and Whitaker (2014:8), educators feel that it is vital to move about with the learners outdoors during free play, but more study is required to ascertain the ideal combination of planned and free "movement experiences and the type of natural features that would best support children's movement and learning".

"Sufficient space is crucial. Rather use less equipment than have too little space. It is very important to have areas large enough to allow children to run about and play ball. Under no circumstances should climbing equipment or swings be set up on cement" (Grobler, Faber, Orr, Calitz & Van Staden, 2004:42). Most serious accidents happen when children fall off equipment on hard surfaces. The effective layout of the playground depends on thorough configuring of the site to provide prospects for varied experiences, "and for the more positive benefits associated with good grounds development, such as stimulation, interest, anticipation and variety. This relies particularly on the creation of shelter and shade, and on the creation of a range of spaces within the site and the use of structure planting. A key principle is to always find solutions which meet the maximum number of needs" (Stoneham, 1996:13).

"There is a need for place-specific playground design approaches (Jansson, 2010 in Refshauge, Stigsdotter, Lamm, & Thorleifsdottir, 2013:2), but it is equally important to turn to other fields within child development to gain knowledge about, for example, play behaviour and developmental stages to strengthen design decisions. When designing for specific user groups, types of situations and sites, it is also increasingly expected that landscape architects base their work on an evidence-based landscape architecture approach (Brown & Corry, 2011 in Refshauge, et al., 2013:2). This approach involves a "triangulation of best design practice, client information and relevant research evidence" (Brown & Corry, 2011 in Refshauge, et al., 2013:2).

2.2.5.2 Potential to transform outdoor spaces into learning environments

There is enormous potential to transform these heavily used outdoor spaces (playgrounds) (Çorakçi, 2010:2; Pigott 2012:112) into exciting learning, playing and socialising environments, to create attractive, child-friendly and sustainable school environments and to encourage increased activity in school settings (Çorakçi, 2010:2).

Educational sites have enormous prospects for generating a progressive effect on children's development, vigour and welfare, because young learners are in these settings for most of their day (Pigott 2012:112). This phenomenon is evident among South African children too. Given the space limitations in the average modern-day city household, community environments play an important role in providing an enriched environment for city children and may be especially critical to the everyday stimulation of developmentally delayed or challenged children.

Beans and Brown (2014:128) are also of the opinion that outdoor encounters should be premeditated with the purpose of giving young learners opportunities to gain more understanding about themselves and their connection with the environment. They caution, though, that care should be taken of the unintentional effects of specific traditions on the education and personal character of learners when their encounters are greatly connected to the impact "of consumer culture" (Beams & Brown, 2014:128). Pigott (2012:112) notes that the literature also focusses on the widespread (but mistaken) belief that children's

play areas are merely spaces for children to blow off steam between education periods in class. In actual fact, the opposite is true: “young children learn and develop through play, so they need well-designed spaces which they can make the most of to become happy, healthy, and creative members of society” (Pigott, 2012:115).

Young children are dependent on us as adults to make sure that the settings that they find themselves in are environments in which they can become familiar with themselves, other kids and natural surroundings because, essentially, they cannot make assessments about these settings themselves. This ceates an opportunity for landscape architects and educationalists to collectively fashion experiential settings for education that inspire children to discover and investigate, construct and mingle, dash and play. The aim is to advance holistic development and to generate a need for learners to be outside among natural surroundings (Pigott, 2012:112). If we can achieve a diverse outdoor setting that brings together accessible green areas, natural characteristics and assembled play apparatus, we succeed in giving young learners a chance to grow their intellect and their physical abilities and cultivate “a healthy lifestyle, rather than a sedentary, indoor one with all of the associated health risks” (Pigott, 2012:115).

2.3 BROAD OBJECTIVES FOR YOUNG CHILDREN’S DEVELOPMENT

Man is a many-faceted and complex being, and different aspects develop in different ways, at different tempos and at different life stages. It is therefore necessary to study the various domains of development, but without losing sight of the whole. “There is a need to focus on development of the whole child through outdoor free play; whole-child development encompasses children’s physical, cognitive, and social, and emotional development. Play is an important, integrated experience, involving physical fitness, creativity and imagination, sense of inquiry, social interactions, self-confidence, and sense of responsibility” (Hill 1980). “The design of outdoor play environments should foster this complex, holistic development” (Pigott, 2012:15).

The broad objectives of children’s development are as follows:

“Neither attractiveness nor innovative design ensure that a playground will play a key role in meeting the educational objectives for outdoor play that are the hallmark of a high quality program for young children. The first step toward playground improvement is to agree upon goals for children's learning. Teachers, administrators, and parents can plan outdoor play areas wisely if they consider these broad objectives for children's development:

- Equipment must be age-appropriate for children's large muscle development. Activities include balancing, throwing, lifting, climbing, pushing, pulling, crawling, skipping, swinging, and riding.
- The outdoor play area facilitates refinement of social skills. Playground design and choice of equipment encourage children to take turns, cooperate, share, and plan together.

- Children are challenged to solve problems outdoors using both physical and social skills. For example, children might lift heavy objects with a pulley or negotiate opportunities to use an especially popular area.
- The outdoor play area enhances understanding of concepts of relationships such as in/out, up/down, over/under, high/medium/low, heavy/light, hard/soft, which is encouraged outdoors through art, carpentry, music, movement, and block building.
- Children advance their physical knowledge about the natural world through changes in the weather, planting and harvesting, caring for pets, balancing themselves or objects, observing relationships between distance and speed, and experimenting with volume and shape.
- Children grow in their understanding of the social world by recreating adult work roles in dramatic play such as fire-fighters, families, garages, and hospitals.
- Children see the outdoor environment as a comfortable setting in which to eat, paint, read, and engage in other activities" (Harms, 1985:3,4).

2.3.1 FACTORS THAT INFLUENCE DEVELOPMENT

"Development may be seen as the gradual observable changes in, or unfolding of, the child in totality, who is en route to proper adulthood" (De Witt & Booysen, 1995:1). The following aspects of sensory and motor stimulation, perceptual development and other aspects of brain development are discussed in relation to school readiness.

2.3.1.1 Sensory stimulation of the young child

To ensure proper functioning of the senses, these must be stimulated from birth. Mental growth is aided by a child's active exploration of his environment. Years of research has proven that children who receive adequate stimulation achieve higher IQ scores than those who lack proper or receive improper stimulation. The child must have rich and varied experiences through his senses, but these must provide developmentally appropriate stimuli in order not to overstimulate the child, which will have a negative effect on development. Stimulating the senses can have a positive effect on learning as well as emotional and social growth in a child. Sensory stimulation in learning means having activities that challenge or make use of the five senses. These senses – touch, taste, smell, hearing, and sight – must be included in one's learning (Schmidt, 2003). Stimulation of the vestibular, proprioceptive and tactile sensory systems promotes development of core posture, bilateral coordination of the body and eyes, praxis (ability to perform planned movement patterns) and achieves optimal arousal states for learning (Stoneham, 1996:11). It seems therefore that sensory stimulation helps to develop controlled movement, but that sensory stimulation is also achieved through movement.

When I discuss the senses in this research project, I refer to the traditional five senses, namely:

- Visual: Seeing
- Olfactory: Smelling
- Auditory: Hearing
- Gustatory: Tasting
- Tactile: Feeling

In order to make the above-mentioned list more complete, however, we could also add the following senses, as suggested by Montessori (1967):

- Chromatic: A broader sense of vision
- Thermic One's perception of temperature
- Baric: Recognising objects as heavy or light
- Stereognostic: Recognising objects by touching and handling them without using the eyes
- Kinaesthetic : This involves a whole-body, sensory, muscular response (Faber & Van Staden, 2005:43)
- and the vestibular sense: the sense of body orientation with regards to gravity (Ayres in Refshauge et al., 2013:16).

It is the brain's job to make sense of the thousands of signals it receives all the time. For each sense there is a special area of the brain which interprets its message. The senses are our window on the world. Only through them can we know what is going on inside and outside our bodies (Storrs, 1984:4).This is especially true of perception. According to Charlesworth (2008:201), "for perceptual growth to take place as it should, the senses must have exercise. That is, children must have practice in perceiving: tasting, touching, hearing, smelling and seeing. The infant is born with many perceptual competencies, but for these competencies to develop as they should, the infant must have experiences with many types of stimuli." In this context, "infant" does not only refer to a baby, but also to a young child. This also complements what Pestalozzi advocated, namely that the child's intellectual abilities had to be developed by means of observation, self-activity (including play) and contact with nature (Verster, 1992:209). Pigott (2012:14) echoes Pestalozzi by stating that sensory discoveries are stimulated when children play in natural surroundings outdoors. According to Pestalozzi, children were to use all their senses (eyes, ears, nose, mouth/tongue and hands) as far as possible in order to get to know sounds, shapes, tastes, smells and numbers (Verster, 1992:20). A simple example of sensory stimulation outdoors, according to Ayres (in Refshauge, Stigsdotter, Lamm, & Thorleifsdottir, 2013:16), is a swing's recurrent swaying, which produces a sensation of pleasure in youngsters as it stimulates the vestibular

senses (Ayres in Refshauge, Stigsdotter, Lamm, & Thorleifsdottir, 2013:16) in the inner ear, which influence "body balance and movement".

Lastly, it is also important to keep in mind that the age-old saying "too much of a good thing can also be bad" also applies to sensory stimulation. Too much stimulation will cause an overload of information, which in turn will hinder the ability of the brain to learn and make new connections. Age, development and individuality all play a role in identifying the optimal stimulation threshold in a particular child (Demene, 2008). Infants need to be exposed to novel objects, sights and sounds gradually as they become comfortable with old ones. They also need to be introduced to new challenges as old ones are successfully mastered. Novel experiences introduced too quickly or profusely can overstimulate and have a negative effect (Wellhousen, 2002:33).

❖ **Milestones in the sensory development of the young child**

Sensory development as a concept is very complex and lacks a clear and consistent definition or description. I will make use of Schmidt's (2003) explanation of sensory development of , namely that "Humans rely on their five senses to experience the world around them. These senses–sight, taste, touch, smell, and hearing–allow each individual to interpret his or her environment; this is called sensory processing. The growth of these senses is known as sensory development." "Developmental theories remind us that children learn experientially through active physical and sensory engagement with their surroundings. From birth, direct, intimate sensory experiences with nature – such as feeling grass underfoot, smelling a crunched leaf, reacting to the sound of thunder – are essential for sensory development" (Sebba, 1991 in Smilkstein 2003:76). Thus, the constructivist view is that when children are exploring, experimenting and making their own discoveries, as they are innately impelled to do, their natural structures are growing and connecting. "These physical structures are the new higher-level knowledge and skills they are acquiring" (Smilkstein, 2003:76).

2.3.1.2 Motor stimulation of the young child

Movement is a vital ingredient of the young learner's existence (Grobler, Faber, Orr, Calitz, & Van Staden, 2004:104). It is the door to his learning (Fredericks, Kokot & Krog, 2006:29). In this way he comes to know things through hands-on experience. Physical and academic capabilities are acquired simultaneously through movement. "Physical skills such as crawling, walking, and running, climbing and hopping are only mastered by repetition. This also applies to kicking and throwing a ball, rolling a tyre and building with blocks" (Grobler, Faber, Orr, Calitz & Van Staden, 2004:104). Moving about in his environment helps the young learner to learn about that environment. "For example, mastering a skill such as jumping leads the child to the discovery of concepts such as high and low. Playing with a ball provides the child with important opportunities for learning about speed, direction and space. Climbing, again, is important for balance and co-ordination. Such play teaches the concepts of above, below,

beneath, behind and beside as well as other information essential for becoming a well-balanced human being" (Grobler et al., 2004:104). "Motor proficiency" denotes explicit skills that the young child uses when moving around. These are gauged by assessing "running speed and agility, balance, bilateral co-ordination, strength, upper limb co-ordination, reaction speed, visual-motor control, upper limb speed and agility" (Sherrill in Pienaar & Kemp, 2014:169). It is very important to monitor these skills in young learners, as inadequate motor ability can hinder many facets of his education (Pienaar; Cairney et al.; Pienaar et al. in Pienaar & Kemp, 2014:167).

The young learner is continually moving about, exploring his internal and external worlds. "The child directs himself at the world around him in order to get to know what everything is like. Every time the preschool child finds something new, and attempts to make it his own by means of movement, he is discovering himself while moving. He is broadening his own potentialities in several respects. He is unfolding and developing himself. It is by doing that men learn" (De Witt & Booysen, 1995:65). The child not only explores his world, but learns how to explore in the process. "Physical movement can therefore be seen as one of the outcomes of child behaviour, and for this reason movement forms an integral part of the child's actualization through becoming and learning. The quality of the learning is crucial, because it will determine the child's control of his world" (De Witt & Booysen, 1995:65). The child engages with his environment and learns from it by means of movement. These experiences "enhance his perceptions and broaden his interpretations; his life becomes enriched and many doors are opened to him" (De Witt & Booysen, 1995:65). Movement is thus an integral part of the young child's development and self-actualisation. The following table describes the value of movement for the child as found in Grobler, Faber, Orr, Calitz & Van Staden, 2004:104.

Table 2.1: Value of movement to the child

DEVELOPMENT	VALUE
Social/emotional	The child not only learns about objects in his world but, through movement, also comes into contact with people….and as a result learns to socialise
Intellectual	The child can only explore and discover the world through movement. Walking teaches him about distance and also about concepts such as above, below, up and down. By investigating with his hands he gets to know his environment. Eye-hand and eye-foot co-ordination are extremely important for a child's school readiness.
Physical:	Movement and physical development are inseparably linked in the child's development. A healthy, physically active child obviously has a better opportunity for exploring and discovering his world than a child whose physical development is stunted.

(a) Milestones in motor development of the young child

Van Staden and Faber (2004:3) note that the necessary physical progress for a young learner during their Grade R year requires cultivation of a resilient and fit physique, achieve motor and perceptual abilities according to their age, understand and regulate their body and be physically self-sufficient. "Up to

the age of four, muscular growth more or less keeps pace proportionally with the growth of the body as a whole. After that the muscles grow much faster, so that some 75% of the five-year-old's weight can be ascribed to muscular development" (Vrey in De Witt & Booysen, 1995:11).

Children gain elementary motor abilities during the formative years. These are classified as fine motor, gross motor and perceptual motor abilities. Fine motor abilities are the small movements that are made by hands and fingers to handle objects. Gross motor abilities comprise the bigger movements that employ the "whole body to move and build strength and balance" (Gallahue; Frost, Wortham & Reifel; Hughes in Pigott, 2012:7). Both perceptual and motor abilities form the basis of the development of perceptual motor skills that are essential in man's manipulation of his world (De Witt & Booysen, 1995:92). "The following perceptual motor skills have been identified: body awareness, spatial awareness (orientation), laterality, dominance, direction awareness, time concept (temporality), crossing the middle line, eye movements, eye-hand-foot co-ordination, gross motor movements, fine motor skills" (De Witt & Booysen, 1995:92,93). "The preschool years constitute the fundamental movement phase, in which children develop motor skills like running, jumping, climbing, throwing, and catching. After developing each skill, they combine them, gaining more and greater coordination of movement" (Gallahue; Frost, Wortham and Reifel; Hughes in Pigott, 2012:7). Customary play areas are commonly planned to further gross motor competencies (Pigott, 2012:7), but both fine and gross motor abilities are stimulated when "playing in nature" (Pigott, 2012:14). The gross and fine motor skills for ages three to seven years are summarised in the table found in Addendum 4.

2.3.1.3 The perceptual development of the Grade R learner

Perception can be explained as "the ability of the brain to make contact with the surrounding world by means of the sensory organs. It also involves the brain's control of the information which reaches the nervous system via the sensory organs, and its processing of and reaction to the information" (De Witt & Booysen, 1995:71). The sensory information is gained from the child's inner and outer world and the brain then interprets and makes sense of the incoming information. Perception is built on sensory and motor experiences. "The initial responses of young children are motor responses and all future perceptual and conceptual data are based in part on these initial responses. Young children must establish a broad base of motor experiences in order for these higher learnings to develop properly. Meaningfulness is imposed on perceptual stimulation through movement. The matching of perceptual and motor data is thought by many to be necessary for the child to establish a stable special world" (De Witt & Booysen, 1995:92). "From this it is clear that physical movement is essential for the development of perceptual motor skills which, in turn, are a pre-requisite for higher cognitive functions and learning" (De Witt & Booysen, 1995:92,93). It is important then to note that perceptual motor skills form the foundation of learning at school, and if learners experience difficulties in this aspect, it could point toward

developmental deficiencies in the future. Teachers and parents should therefore be knowledgeable about "the normal progress of his perceptual development" (De Witt & Booysen, 1995:85).

Also, perceptual awareness in children has been linked to low levels of passive withdrawal. That is, the more a child is aware of their environment, the less motivation they have to play alone when given the opportunity to play with peers. The perceptually aware child appears to be particularly sociable, even pro-social (e.g. empathetic) in peer interactions, less likely to withdraw from the peer group and less likely to engage in aggression (Evans, 2008:63). Although social development is not the main focus of this study, it is important to note that sensory, motor and perceptual development encourages social development on various levels.

2.3.1.4 Aspects of brain development and the outdoor learning environment

The sections below discuss the optimal learning periods of the young child, including the link between physical development and cognitive outcomes, perceptual development and cognitive development in the outdoor learning environment if there are opportunities to access and engage with the surroundings.

(a) Cognitive development of the young learner

Cognitive learning is seen as an advanced, non-automatic method to gather information about the environment. One's thought processes play an important role in this respect. Through cognitive learning the individual is aware of his experiences as they occur, and he is able to adapt himself with a view to future experiences, to form expectations of the consequences and to adjust his behaviour to get the results he wants (De Witt & Booysen, 1995:49).

What is significant in the literature is the interest in brain development through stimulation. Clark (in De Witt and Booysen, 1995:80) explains that during these growth periods, visual, mental and motor systems are ready to be used. He further explains that if the environment activates these systems, they will be used together at peak efficiency. He noted that the time when an organisational process accelerates most rapidly is a critical period for the resulting organisation, and if this process is not used during this growth period, the process or function will be lost. Epstein (in De Witt and Booysen, 1995:82), set the periods of accelerated brain growth in the young child between two and four years of age and between six and eight years of age. He termed the correlation between accelerated brain growth and accelerated cognitive development "phrenoblysis" and proved this correlation by citing research conducted in the USA and Canada, where environmentally deprived children were stimulated to such an extent that their cognitive skills corresponded to those of control groups.

Slabbert simplifies and integrates the work of Adams to produce an explanation of how the brain learns (constructs knowledge) by constructing neural networks and associated structures and actions. Neural networks grow from challenging experiences through direct interaction with the internal and external

environment. They grow almost instantaneously and may be retained for a lifetime even after only one exposure to a powerful emotional experience, but only from what is actively, personally and specifically encountered. "Neural networks grow when confronted with challenging experiences and die when they are not used" (Slabbert et al., 2009:55,56). It seems that there is a contradiction stated here, but the brain decides what to retain and what to discard, therefore some networks might last a lifetime after one encounter and others die if not used. Merzenich also spoke about the period of child development when much change comes about from external and internal influences. He states that “powerful self-shaping processes of the forebrain machinery are in operation on a massive scale, as the brain is refining and developing, through progressive learning, its great array of hierarchically organized perceptual, cognitive, motor, and executive skills, and as it is receiving, sorting, and storing massive quantities of externally and internally generated information" (Merzenich, 2001:68).

Research by Evans (2008:45) states that there appears to be a correlation between the awareness a child has of their surroundings and their ability to control, order, adjust and synchronise action, thoughts and emotions to achieve certain objectives and aims. It seems that an awareness of one's environment may actually increase a child's ability to learn from perceptual stimuli and thereby allow the child to exercise effortful control/constraint in response to environmental stimuli. Dunn (in Evans, 2008:46) explains that being aware of one's environment is referred to as sensitisation of the nervous system and is indicated by central nervous system stimulation that allows the child to distinguish between dangerous or essential stimuli. “This awareness is necessary for children to firstly become aware of and observe things in their environment and then become accustomed to them in order to give other new and different features of the environment attention; a process known as habituation." According to McCall and Carriger (in Evans, 2008:46), this ability to habituate and dishabituate to novel stimuli in the environment has been linked to positive cognitive outcomes in children.

(b) Optimal learning periods of the young child

In subsequent research of the literature, I found that there are not only educational advantages when children interact with nature, but there are certain periods in a young child’s life when the advantages of spending time outdoors are optimal for cognitive development. Over the past 25 years, research has revealed that there has been an increased interest in optimal learning periods of children. According to De Witt and Booysen (1995:80) there are optimal or critical learning periods in the pre-school child's life when maximum learning takes place with the minimum effort. “These periods correlate with the rapid development and organization taking place in the brain and the central nervous system." Addendum 5 contains a table illustrating the periods of cognitive development of the young child as explained by prominent theorists.

According to Pienaar and Kemp (2014:169), “the early childhood years are a vital developmental period in which to optimize the motor development of young children.” Pigott (2012:6) also mentions that recent

research indicates that the period between three and five years plays “one of the biggest developmental roles in determining children’s growth, as well as their personality traits and how they will relate to others and their surroundings" (Cardon et al., 2008; Greenman, 2003; Herrington & Studtmann, 1998 in Pigott, 2012:6). Young children gain various abilities needed to become healthy grown-ups. “Many habits that last a lifetime are formed during these developmentally crucial years, including habits and feelings related to outdoor activities and nature” (Wilkinson; Moore in Pigott, 2012:6). “Between the ages of two and six, children play more than during any other time period, and play is the main factor in their development” (Frost, Wortham & Reifel in Pigott, 2012:6). Encounters during these years (0-6) have a great impact “on their future development and lifelong health, learning, and behavior” (McCain & Mustard in Ernst, 2013:14).

In their early years, children go through a critical stage in which their nervous system and synaptic organisation exhibit high plasticity (Huttenlocher in De Witt & Booysen, 1995:80)). It is therefore widely recognised among educators that early childhood is crucial for a child’s cognitive, social and emotional development. This is especially true for children with disabling conditions, whose intellectual development and academic achievement have been shown to respond positively to preschool treatments (Campbell & Ramey in De Witt & Booysen, 1995:80)). Due to this plasticity, the environment can be creatively structured to facilitate child development. Crucial to this plasticity of the nervous system is a proper level of arousal maintained through balancing excitatory and inhibitory inputs. An optimal environment elicits an appropriate level of arousal of the nervous system to maximise the individual’s potential processes (Pettigrew, 1978; Kasamatsu, 1982 in De Witt & Booysen, 1995:80). The term “readiness” is used for the onset of such an optimal learning period. It means that the child has mastered all the necessary prerequisite skills and is motivated to learn the new task or skill (De Witt & Booysen, 1995:80). It is important to keep in mind that the pre-schooler’s sensory organs might not yet be fully developed (Faber & Van Staden, 1997:27); in the above literature, I therefore focussed specifically on the young child between three and seven years of age. This includes the Grade R learner, who is typically aged five to six.

(c) Cognitive development in the outdoor learning environment

I further investigated how cognitive development could might take place on the outdoor playground. Stoneham (1996:11) noted that playgrounds can be redesigned to ensure that children receive adequate sensory stimulation to optimise motor development and learning. These settings are widely esteemed for the educational opportunities that they offer. According to his research, teachers also highlighted many functional benefits that their pupils gain from using the outdoors effectively as part of both the formal, informal and hidden curriculum, such as improvements in sensory perception, social skills, co-operative skills and work patterns, enhanced learning opportunities outdoors, a greater variety of patterns of play –

both in a physically demanding, adventurous sense and in the provision of quieter, restful opportunities and improvements of special education in general.

Certain circumstances encourage cognitive development in a young child. These are aspects such as opportunities to access and engage with surroundings as well as being aware of surroundings. There are also optical learning periods in a young child's life. I look at these aspect in more detail below. A rich array of opportunities in children's surroundings is not sufficient to ensure brain development, however: access to engage with these surroundings is equally important. Children have independent mobility to explore their surroundings, and if they find responsive affordances around them, they become motivated to explore further and to discover more. In this process, it may be added, they are building a growing repertoire of environmental competencies (Spencer & Blades, 2006:142).

Another aspect to consider is children's awareness of their surroundings. Young learners construct more significant connections with natural surroundings that they are acquainted with because the association with their environment motivates their interest to be involved (Ghafouri, 2014:56). A simple example would be that the young learners would be much more interested to learn about the caterpillar they encountered in the school yard than about an animal that they have not encountered in their environment. The play setting that young learners find themselves in influences how they act in those settings, in turn impacting on their "development, health, and overall well-being." Children must have a desire to be outside, in a natural setting, and this can be achieved by planning outdoor settings that inspire young learners to be inquisitive, use their little bodies energetically and to socialise with each other (Pigott, 2012:15). "Growth towards competency and responsibility does not take place automatically, however. It depends upon the nature and richness of experience available to the child and his abilities. Here the environment plays an important role: the child learns through exploration and discovery in a concrete context. In spite of the child's own initiative for learning, he needs the guidance and support of a teacher. Through her association with him the teacher helps to equip the child with a sound foundation for meeting the tasks and challenges of future learning" (Grové & Hauptfleisch, 1989:1). Grown-ups that show interest and are involved in the outdoor learning environment experiences can facilitate learning through play and form a very important part of the learning experience (Pigott, 2012:15).

It therefore seems to be of vital importance to optimal brain development that the right environment is created for this physical development to take place. According to Miller and Cummings (in Rushton et al., 2010:351), our brains are continually changing as each experience helps either to grow new neurons or prune away old ones. This growth will strengthen the neurological networks already existing and create more interconnecting dendrites—the essence of learning—in a young child's brain (Diamond & Hopson in Rushton et al., 2010:351). The brain's neurological wiring changes as each new experience forms new dendrites. Neuroscientists refer to this latter process as "plasticity". It is evident that if a young child is

"immersed" in a rich learning environment (Rushton et al., 2010:355), one that is filled with age-appropriate literature, materials to manipulate and questions that excite the child's interest, then greater learning opportunities can arise. Immersing a child in an environment that stimulates all the senses has an emotional element too: it alerts the brain's neurological networks that something here is worth paying attention to, and learning is likely to occur (Rushton et al., 2010:359). By purposely organising the learning environment, opportunities for active engagement can be created. This is not new information, as Piaget (1995) in his writings about the growth of intelligence in young children emphasises the fact that mental growth is aided by a child's active exploration of the environment. The child, according to Piaget, gradually comes to understand how things can change as he or she experiences different materials in various situations in his environment (Mayesky, 2006:174).

2.3.2 THE RELATION BETWEEN SENSORY, MOTOR, PERCEPTUAL AND COGNITIVE DEVELOPMENT AND IMPLICATIONS FOR SCHOOL READINESS

It is important to understand the link between sensory, motor, perceptual and cognitive development and how this influences school readiness. The literature reveals that positive cognitive outcomes in children can be linked to physical development in early childhood. Results and findings of research done by Perry (2010:iii) indicate that educators attribute significant importance to physical development in early childhood as a building block for the development of further cognitive skills and academic achievement. Educators demonstrated an in-depth and extensive comprehension of physical development pertaining to early childhood, and their understanding thereof is reflected in their teaching practices and in offering varying opportunities and ways in which to learn (Perry, 2010:iii). Fredericks, Kokot and Krog (2006:29) explain that "(t)he body is a sensory-motor response system that causes the brain to organize itself." There seems to be an intricate relationship between the mind and the body, as contended by numerous academics advocating the significance of movement for learning. "Brain research has shown that the brain is "plastic" in that it can adapt continuously, and its structure can be changed by certain kinds of stimulation, including movement", which is vital to education and can be considered "the door to learning" (Fredericks, Kokot & Krog, 2006:29).

Young children between three and six years of age join "the use of their senses with motor skills to develop perceptual motor skills, which help them understand their place in their environment. This development occurs when children gain awareness of space, time, and their bodies and their movements" (Frost, Wortham & Reifel; Gallahue; Jambor in Pigott, 2012:9). This stage of development can be improved by enhancing play settings to support the children to form "a strong sense of place" (Pigott, 2012:9). It is therefore clear that particular rudimentary actions have to be established before perception can develop, and this can prevent subsequent perceptual difficulties. "The child's sensory integration must first be developed before the perceptual modalities will be in place" (Van Zyl, 2004:147). If sensory integration does not take place as it should, intelligent children display difficulty with learning

and in their performance at school. “Pearson correlation analyses indicate a highly significant correlation between most of the perceptual development modes, related subjects and performance in literacy and numeracy” (Van Zyl, 2004:147). The link concerning “the senses, sensory integration, perception and learning” (academic achievement) can be seen as stages in a developmental process. There is a positive order in which the young child’s development must happen. The first stage in the order lays the basis for the following stage, and so forth. If the foundation is not laid properly, the steps that follow cannot be developed fully either. In the light of this, it can be assumed that issues such as perceptual development (as part of school readiness) “will always have a significant effect on the school success (performance) of Grade 1 children” (Van Zyl, 2004:147).

More recent national research has been published about the deficiencies within the education system with regard to perceptual motor learning preparation of Grade R learners in the South African Journal of Childhood Education. It was found that "[t]he level of learning readiness of pupils when entering formal teaching in Grade 1 is determined by perceptual motor stimulation that pupils receive during the preschool phase." The aim of this study by Erasmus et al. (2011:46) was to determine the physical deficiencies that could negatively affect children's "perceptual motor development and school readiness", and it was established that there is a direct link between perceptual motor stimulation and the level of learning readiness of Grade 1 pupils. This research was significant to my study, as it was done in the North West province of South Africa, which is next to Gauteng, the province in which I conducted my research. “The motor proficiency of more than 50% of school beginners was below average. These shortcomings place a high percentage of school beginners at risk for developmental problems associated with inadequate motor skills and should consequently be addressed, especially during the preschool years and the initial years of the primary school phase” (Pienaar & Kemp, 2014:167). I therefore deduce from the literature that the more successful learning is facilitated in the outdoor learning environment, in particular sensory, motor and perceptual development, the better children are going to perform at school, not only academically, but also socially and emotionally. This also correlates with the optimal learning periods mentioned in the literature review.

2.3.2.1 The link between positive cognitive outcomes of physical development in early childhood and school readiness

“Early childhood is a very important phase for motor development” (Van Deventer, 2011:824). Proficient motor skills are related to improved school adjustment and better relations with peers. Conversely, inadequate motor skills impede the successful changeover to formal schooling (Pienaar & Kemp, 2014:167). “If these skills are not sufficiently developed in the school beginner, the child is likely to develop specific learning problems” (Pienaar & Kemp, 2014:167,168). Krog and Kruger (2011:173) state that “movement is a prerequisite for learning readiness. There continues to be growing research that movement and bodywork improve brain function and learning. Learning readiness requires the effective

functioning of lower level systems in order for the higher level systems to perform adequately". Therefore the young learner must satisfy various developmental requirements, and good motor and physical development are essential aspects for school readiness. High levels of motor deficiencies "among South African children reflect modern tendencies among youth of inactivity and the use of technology, and set the basis for the development of chronic diseases and an unhealthy nation" (Pienaar & Kemp, 2014:49). It indicates that there are most probably high percentages of learners who struggle at school because they are not physically ready for the requirements set for them and encounter minor learning difficulties.

There is consequently great concern about the "current level of motor proficiency of young school beginners in South African schools" (Pienaar & Kemp, 2014:169). "Notwithstanding contemporary societal factors that impede the development of fundamental motor skills, the South African educational system is another major factor that impedes the development of these skills" (Van Deventer, 2011:824). Research shows that South African learners "are at a clear cognitive disadvantage to their peers in developed countries" (Vally, 2012:617). This matter of "inadequate child cognitive stimulation requires immediate remediation given its widespread prevalence in developing countries" (Vally, 2012:617). Gehris, Gooze and Whitaker (2014:1) note that teachers in early childhood centres are valuable resources for promoting learning and school readiness through movement, but not enough research has been done to fathom educators' understanding of these matters. This study aims to add to research regarding the importance of movement to learning from the perspectives of Grade R teachers in South Africa.

2.4 CONCEPTUAL FRAMEWORK OF THIS STUDY

This study was conceptualised in terms of and based on the following framework pertaining to the outdoor learning environment:

2.4.1 UNDERSTANDING THE DESIGN, USE AND REASON FOR USING OUTDOOR LEARNING ENVIRONMENTS, INCLUDING PEDAGOGY AND DIDACTICS OF USE

There is enormous potential to transform outdoor spaces into exciting learning, playing and socialising environments, to create attractive, child-friendly and sustainable school environments and to encourage increased activity in school settings (Çorakçi, 2010:2). However, it is not enough to have a rich collection of prospects available in children's surroundings; the right to use these prospects is equally necessary (Spencer & Blades, 2006:142).

2.4.2 COGNITIVE DEVELOPMENT INCLUDES PERCEPTUAL DEVELOPMENT THROUGH SENSORY STIMULATION AND HUMAN MOVEMENT

White (2008:2) stated that young children assimilate knowledge by means of all their senses and that they need appropriate encounters with their environment. "Their brains are like sponges, noticing detail

and things that adults miss or filter out. They need real and relevant experiences, with lots of handling, direct contact and playful exploration of materials" .They have a particular way of interacting with their world and of learning about it. They interact and learn through movement and doing, involving their whole body to find out about their environment and to express themselves. “Movement experiences develop essential structures within the brain and nervous system" (White, 2008:3).

2.4.3 SCHOOL LEARNING READINESS INCLUDING POSSIBLE PREVENTION OF MINOR LEARNING DIFFICULTIES

From research done by Stoneham (1996:11), it is clear that the value of school grounds as an educational resource is widely recognised in special education. Deficiencies within an education environment with regard to perceptual motor preparation of Grade R learners have a direct impact on the learning readiness of Grade 1 learners (Erasmus, Van Rensburg, Pienaar & Ellis, 2011:60). Adequate and appropriate sensory and motor stimulation leads to a decrease in minor learning difficulties, as discussed in section 2.3.2.1, as children are better equiped for formal schooling.

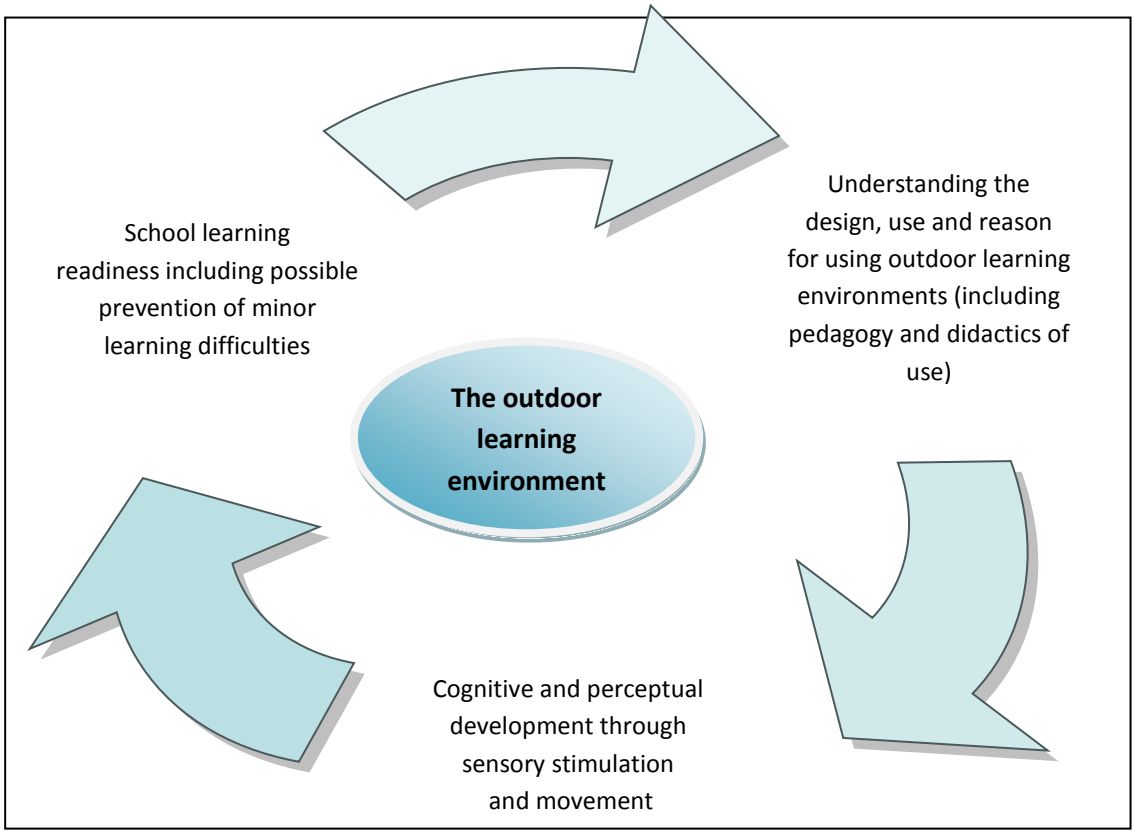

Figure 2.1: The conceptual framework of the research study

2.5 THE THEORETICAL FRAMEWORK

From the literature it was evident that learning theorists such as Rousseau (Verster, 1992:111) and Pestalozzi (Verster, 1992:136), Piaget (De Witt & Booysen, 1995:13) and Vygotsky (Charlesworth, 2008), as well as Epstein (De Witt & Booysen, 1995:81) all have theories relating to and supporting outdoor

learning through play. Bruner's constructivist theory, as well as Roger's experiential learning, was also especially insightful when looking at this research topic.

For the purpose of this research project though, the focus is on eight (collective) principles of the design and use of an outdoor play environment as extracted from the work of Montessori in Meier and Marais (2007:22), Maria Montessori (Montessori, 1988; Feez, 2011), Loris Malaguzzi (Cadwell, 2003) and as used by the Scandinavian Forest School Movement (Knight, 2009). Together with these principles, the model of and for facilitation of learning as found in Slabbert et al. (2009:118) is used. This model is the lens used to look at this study, particularly how Slabbert adapted and applied different theories and constructivist underpinnings relating to his model. Firstly, here is an overview of eight universal principles of the design and use of an outdoor learning environment as found in the work of Maria Montessori (Montessori, 1964), Loris Malaguzzi (Cadwell, 2003) and as used by the Scandinavian Forest School movement (Knight, 2009).

Table 2.2: Eight universal principles of the design and use of the outdoor playground

Principle	Implementation	School of thought
1. Aesthetic wellbeing of child	Natural resources used on playground and mostly wood; beautiful gardens; art outside	Williams-Siegfredsen (2012:11); Bennet (2001)
2. Nature		Williams-Siegfredsen (2012:47, 49); Bennet (2001)
2.1 Water	Water transported by children from one area to another. Areas for water play	
2.2 Earth	Digging pits in sand and earth	Williams-Siegfredsen (2012:47, 8)
2.3 Air	Fresh outdoor air Wind	Williams-Siegfredsen (2012:47); Williams-Siegfredsen (2012:49
2.4 Fire (illegal in South Africa)	Fire pit	Williams-Siegfredsen (2012:49); (Feez, 2011)
2.5 Animals	Depending on available space; can range from large to small animals – hens, goats, rabbits, pigs, horses etc. Aquaria	Montessori (1988:77) Montessori (1988:75)
2.6 Plants	Containers with children's own plants - "A garden that is dear to us"" Picking fruit Vegetable garden Watering plants, searching, gathering, distinguishing plants with different scents	Montessori (1988:77) Montessori (1988:75)
3. Risk and challenge	Opportunities for children to learn how to assess risks and accept challenges, e.g. climbing trees	Williams-Siegfredsen (2012:12); Feez (2011:51,52)

Principle	Implementation	School of thought
4. Real equipment and tools proportionate to the size of the child	Child-sized wheelbarrows, spades and buckets; garden tools such as rakes, brooms etc.	Williams-Siegfredsen (2012:48); Feez (2011)
5. Physical activities		Williams-Siegfredsen (2012); Feez (2011:51,52)
Gross motor	Rolling, crawling and sliding down slopes, through tunnels Mounds of grassed earth Hills with climbers	Williams-Siegfredsen (2012:47); Bennet (2001)
	Balance - Bikes and go-carts Climbing	Williams-Siegfredsen (2012:47) Feez (2011:51)
	Sensory swings: • Swinging (both seated and by the arms) • Holding and carrying • Balancing (e.g. along narrow raised ridges) Walking (on different surfaces and gradients, up and down stairs).	Williams-Siegfredsen (2012:47) Feez (2011:51,52)
Fine motor	*Movement of the hand* • Grasping and manipulating objects Using the thumb and forefinger (pincer grip).	Feez (2011:51,52)
Risk and challenge	Opportunities for children to learn how to assess risks and accept challenges, e.g. climbing trees	Williams-Siegfredsen (2012:12); Feez (2011:51,52)
6. Must include a teacher / pedagogue	Role is to support and guide the child in how to assess risk for themselves	Roopnarine & Johnson, (2013:337); Hall, Horgan, Ridgway, Murphy, Cunneen and Cunnigham (2010:45)
7. Open spaces	Children must be able to run freely	Feez (2011:41)
8. Freely chosen activity directed towards a goal	Self-initiated inquiries, activities or play	Feez, (2011:48)` Ghafouri (2014:58)

The structural usefulness of these principles becomes limited when looking at the search for meaning and authentic learning of the child. Here the model of and for facilitation of learning as found in Slabbert et al. (2009:118) provides a constructivist lens of facilitation from which to study the literature and findings of the study. This model is based on the theory of John Dewey and Piaget, amongst others (Slabbert et al. 2009:45). I therefore indirectly draw on the theory of Piaget and Dewey in this study in the form of the model proposed by Slabbert. The reason I chose these two models to underpin this study is that different knowledge registers in South Africa can be accommodated using these models.

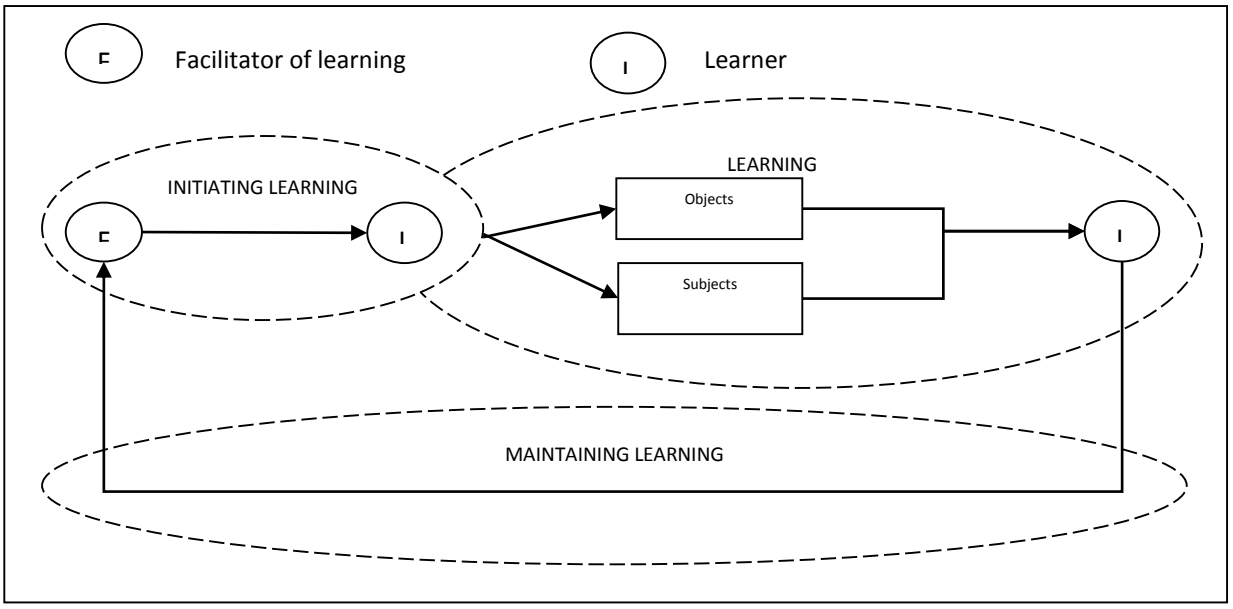

Figure 2.2: The broad model of and for facilitation of learning (Slabbert et al., 2009:118)

In this model (Slabbert et al., 2009:102), initiating learning requires the relationship of searching for meaning. Furthermore, learning requires the relationship for constructing meaning, and maintaining learning requires the relationship of enhancing meaning. The effect implies an active exploration of the outdoor environment with the assumption that this process can take place in free play as well as facilitated outdoor play. For the purpose of this study, perceptual development on the outdoor playground forms part of the process of authentic learning (Slabbert et al., 2009:68), as this development must be seen as a holistic process and not only an activity to a means.

The theoretical framework is thus a combination of the above theories and places the study in a holistic context in relation to other aspects that play a role in Slabbert's model. This framework will enable the analyses of data emerging from the case studies within a holistic and constructivist approach to learning. Triangulation of this research will be possible, as this research builds on much research done in other fields too, such as educational psychology, occupational therapy, landscape architecture and others (Thelen 2001:161; Merzenich 2001:68; Postner 2001:387). This research however, focuses on the educator's perspective of how design and use of outdoor learning environments can benefit perception of the Grade R learner.

2.6 CONCLUSION

I critically synthesised and integrated more recent studies about the design and use of an outdoor learning environment for sensory and motor stimulation using a combination of printed and electronic journal sources of national and international research as well as some general literature (Jansen, 2008). These studies related to sensory and motor development and the outdoor learning environment for perceptual and cognitive development. I examined the shortcomings in the existing literature on my

research topic and indicated how this research study attended to the identified gaps or limitations in the current knowledge base (Jansen, 2008). I did this in order to position my research, done in Pretoria, in a framework within which to view the study in relation to other reputable research and to configure guiding principles for learning environment designs. My findings were therefore built on and complement existing research and are validated by the findings of the cases studied in this research.

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CHAPTER 3: DATA COLLECTION

Research design and methods

3.1 INTRODUCTION

Chapter 3 explains the paradigmatic perspectives of the research project and describes the research design chosen. The design was very important for this study, as it provided a strategy and framework of how the research would progress (Bogdan & Biklen, 2003:49; Mouton, 2001:55; Creswell et al., 2010:70). The chapter describes the data collection strategies I undertook to gather all the data needed for the research as well as a discussion of the analysis techniques employed. Lastly, the trustworthiness and ethical considerations of the study are argued.

3.2 PARADIGMATIC PERSPECTIVES

The hermeneutics and the phenomenology (Brown & Heggs, 2005:293) for this research project are positioned in the qualitative, interpretivist paradigm, therefore the underlying research epistemology is interpretive and consequently my approach to this research project is qualitative in nature (Burton & Bartlet, 2009:18). "Interpretivism seeks to uncover meaning and understand the deeper implications revealed in data about people" (Somekh & Lewin, 2005:346). An advantage of working within the interpretivist paradigm is that in-depth data can be collected and the context this data is collected in is understood. Interaction (Creswell et al., 2010:291) and conversation are possible with the participants to gain insight and to form a clear understanding as to how perceptual development is perceived to take place on the playground. Generally, interpretivism attempts to understand phenomena through the meanings people assign to them (Creswell et al., 2010:59) and is based on the assumption that there is not one reality, but many. This was kept in mind especially during the interviews of the Grade R educators in the different case studies.

Interpretivist researchers carry out their studies in natural contexts to reach the best possible understanding (Creswell et al., 2007:37). As a result, the researcher does not attempt to manipulate the phenomenon of interest (Norris & Walker, 2005:132), and the research is carried out in "naturally occurring context and not in experimental situations" (Creswell et al., 2010:51).

In this research project the aim is to understand as much as possible of the participants and the environment (context) in which they find themselves without consciously influencing them. This will allow close interaction with the participants and provide insight into and form a clear understanding of what

they perceive to be environments conducive to perceptual development (Creswell et al., 2007:291). As a researcher, I still had to try to be thorough, precise, meticulous and accurate, even if the studies are not generalisable (Burton & Bartlett, 2009:21). The aim of this qualitative interpretivist study was not to generalise to the larger population (Creswell et al., 2007:294), but to add to understanding of the research topic; nevertheless, there might be transferability in some cases, which I will discuss in section 5.5.1.

The research was inductive. "Inductive refers to the process of constructing theories from empirical data by searching for themes and seeking to make meanings from evidence" (Somekh & Lewin, 2005:346). The study was also empirical and inclusive in nature, which means that this research involves the collection of data about people and their social context by a range of methods (Somekh, Burman, Delamont, Meyer, Payne & Thorpe, 2005:1).

Data gathering for this research was qualitative in nature, and I therefore pursued qualitative methods in the data collection process. The data collection instruments and techniques selected were used in the broader research approach and in concert with research methods which are qualitative in nature and fit into the interpretivist paradigm. Methods favoured in interpretive studies are informal interviews and observation, which allow the situation to be as “normal” as possible (Burton & Bartlett, 2009:21).

I wanted to follow a naturalistic enquiry were the emphasis was on the individual contact with the Grade R teachers instead of detached methods of data gathering (Norris & Walker, 2005:133). Therefore more naturalistic, unobtrusive methods of data gathering were chosen (Burton & Bartlett, 2009:21; Creswell et al., 2010:77), such as face-to-face interviews and observations. I incorporated as many methods of data gathering as were practically possible and would increase the trustworthiness of the study (Creswell et al., 2010:80).

The answers to the research questions were not measurable, and therefore a qualitative study was chosen. It fitted the requirements of the research question best in that it uses data collection methods that best gather the appropriate data needed for a deeper understanding of the question. The validity and reliability of the findings were also checked by using multiple methods and by cross-referencing; i.e., crystallisation was used to establish the validity of the findings.

Detailed evidence was gathered on how Grade R teachers design and use outdoor learning environments to improve perceptual development through sensory and motor stimulation, as the collection strategies focussed on gathering descriptive data (Bogdan & Biklen, 2003:50). The data was obtained directly from the pre-school case study sites, the Grade R teachers and Grade R learners (Norris & Walker, 2005:133). I made use of a range of data gathering methods for this purpose for the duration of the research (Creswell et al., 2010:293; Stark & Torrance, 2005:33; Burton & Bartlett, 2009:63).

3.3 RESEARCH DESIGN

A "design" refers to the plan or blueprint of how the research will proceed (Bogdan & Biklen, 2003:49; Mouton, 2001:55; Creswell et al., 2010:70). I needed to set out beforehand how I was going to conduct the research and which research methods to apply, thus ensuring that the visits would cover all the aspects that might be of value to the study and avoiding the need for repeat visits to collect missing data when themes emerged from the data analysis. While it is important to have a clear action plan, it must not be allowed to become too rigid and should allow for changes according to altering circumstances (Burton & Bartlett, 2009:40).

Therefore I left some room for adaptions to the plan, such as a change in the sequence of planned events, as well as the order in which I visited the schools, drew up the site plan and did the interviews. These included working around the schedule of the teachers for the interviews and also waiting for all the consent letters to be returned. I also realised while in the collection process that I had to change some collection techniques and that some rubrics were more user friendly and suited for gaining the appropriate information than others. The research design was flexible and was moulded and modified as the research process proceeded (Bogdan & Biklen, 2003:50), with design decisions being made throughout the study (Bogdan & Biklen, 2003:50). "It is not possible to pre-specify in detail the design for a naturalistic enquiry; the design of a naturalistic enquiry unfolds as the study progresses" (Norris & Walker, 2005:133).

This study made use of the case study methodology, which I discuss in the next section.

3.3.1 CASE STUDY METHODOLOGY

Case study methodology or research is a “systematic inquiry into an event or a set of related events which aim to describe and explain the phenomenon of interest” (Creswell et al. 2010:75). This methodology was used because it offered me a multi-perspective analysis of the data and helped me to come to a clearer understanding of the dynamics of the situation (Creswell et al., 2010:75). This research method also gave me, as the researcher, the opportunity to investigate a study that does not have straightforward answers. "Case study design includes methods to collect both descriptive and explanatory data within a study" (Creswell et al., 2007:294). The research was carried out in real-life situations and not in experimental situations.

The term “case study” can be used to describe a unit of analysis or a research method (Creswell et al., 2010:75). A case study is defined by the fact that it is a bounded system, but that does not necessarily mean that one site only is studied. The aim of this case study research is to provide descriptions, and not necessarily to test or generate theory (Eisenhardt, 1989:535). It was determined in advance what evidence to gather and what data analysis techniques to use to answer the research questions (Creswell

et al., 2010:76). For the qualitative component of the study, the multiple case study design (qualitative component) was selected, as it assisted me in gaining a clearer understanding and acquire knowledge regarding social issues under investigation. Furthermore it provided me with multiple sources of information and facilitated the process of exploring and describing the phenomenon clearly (Mark in Fouché, 2002).

From an interpretive perspective, the typical characteristics of case studies are that they strive towards a comprehensive (holistic) understanding of how participants relate and interact with each other in a specific situation and how they make meaning of the phenomenon under study (Bogdan & Biklen, 2003:55). These data collection methods allowed me to make sense of the participants' life worlds by interacting with them, appreciating and clarifying the meanings they ascribe to their experiences (Creswell et al., 2010:77). These methods also allowed for open-ended questions and for probing deeper to get a broader understanding of the design and use of an outdoor learning environment for sensory and motor stimulation. Data collection instruments and techniques that were selected fitted within the selection of a broader research approach and research methods in that they are qualitative in nature and fitted into the interpretivist paradigm. I also checked the validity and reliability of the findings by means of multiple methods and by doing cross-referencing, i.e. I made use of crystallisation to establish the validity of the findings.

The research design chosen includes qualitative methods in accordance with the qualitative approach to the research. A case study was used to provide an in-depth understanding of the phenomenon and to establish the trustworthiness of the information by collecting data from various sources (Creswell et al., 2010:80). This study can be described as a multiple case study because data was collected from three schools, with myself as the research instrument (Bogdan & Biklen 2003:4). According to Bless and Higson-Smith (2006), a case study design involves comprehensive and systematic investigation of a few cases. For the purpose of this study the sample included three pre-primary schools that I could learn from. I gathered in-depth information by applying a variety of data collection techniques over a sustained period of time of five weeks. However, the case was sometimes restricted by time and school activities (Stake in Fouché, 2002; Maree 2007:294), as outdoor playtime was only a certain amount of time every day. It was also not possible to follow all the outdoor break times during the course of the day, therefore the data was collected only during the main play break in the morning.

3.3.2 IDENTIFYING THE UNIT OF ANALYSIS

Pre-primary schools were the main focus in this study and therefore the identified unit of analysis. The unit of analysis consisted of three sites that were purposefully selected because "in qualitative data collection, purposeful sampling is used so that individuals are selected because they have experienced the central phenomenon" (Creswell et al., 2010:295). I made use of a small sample size and the participants were selected according to a stratified, purposeful sampling strategy. This meant that the

participants were selected according to preselected criteria relevant to the research question (Creswell et al., 2010:79). The criteria for selection of the schools were based on the design of their playgrounds and the age of the children attending the school.

Therefore the sample had to consist of:

- a pre-primary or nursery school with children's ages ranging from three years old to Grade R learners,
- qualified Grade R teachers,
- an outdoor playground of value to the study in terms of opportunities for sensory and motor stimulation, and
- participants within the Pretoria area, as the researcher conducted visits to the selected schools.

A short description of each case study site is provided below, referred to as School 1, School 2 and School 3. A site map is provided as well as a site inventory for each school.

3.3.2.1 School 1

School 1 was established in 1985. The school is known for its quality indoor and outdoor programmes. The school is situated in an affluent area and has an extensive outdoor playground. The school meets all the criteria for selection. A virtual tour of the playground can be found in the form of a video clip and photos in Addendum 3 on the CD.

Figure 3.1: School 1 Grade R classroom

Figure 3.2: School 1 outdoor playground

(a) Site Map

The site map of school 1 shows schematic details of the outdoor learning environment layout. This gives a perspective of the site and indicates the opportunities for sensory and motor development.

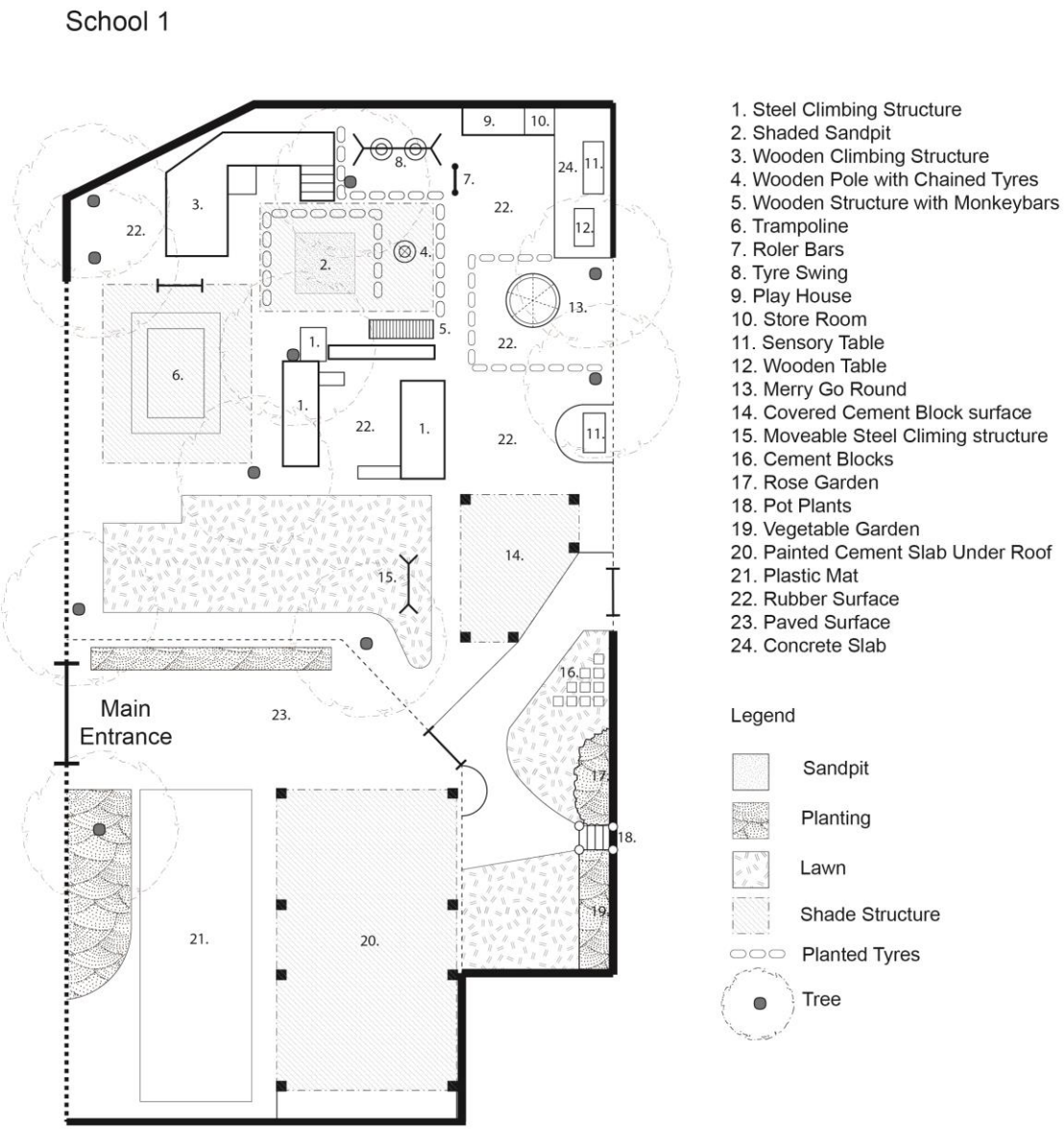

Figure 3.3: Site map of the outdoor playground of school 1

(b) Site inventory

The site inventory contains a detailed description of the site of each school. It formed part of the description of each site as well as being a data collection instrument to determine the opportunities for sensory and motor development. The inventory therefore forms part of the data for this research study, but is included in this chapter as it comes with the site map.

Table 3.1: School 1 playground site inventory table (adapted from Pigott, 2012)

Item	Description	Interpretive discussion about the relevance to sensory and motor stimulation on the outdoor playground
Total area	Approximately 586 m^2	The total area was big enough for the Grade R learners, but the play equipment catering for all the ages that play on this playground made it somewhat crowded
Open grass area	Approximately 75 m^2	It did not seem that the area would invite free and spontaneous running, as it was rather small. It was, however, good for sensory stimulation to have grass available in this section, as it was the only area with natural ground cover.
Paved space for biking/running	Area cordoned off approximately 25% of total playground	This area was only accessible for free play in the afternoons
Ground cover	Rubberised surface, grass, paving, painted paving, 2 types of big concrete tiles, sand, soil, plastic mat, concrete.	A wide variety of ground cover for sensory development, but there was no place to play freely in the soil itself.
Vegetation	Very big trees, shrubs, rose bushes, flower baskets and pot plants with flowers, vegetable garden and rosemary and lavender bushes, grass.	The children did cultivate the garden themselves. Interaction with the vegetation was limited, but there was a wide variety to view. Rosemary and lavender bushes were next to pathways and children could touch them or brush against them while passing by.
Sun/shade	Mix of sun, shade and semi-shade. Vast areas of shade and semi-shade due to the big trees and shade nets.	Both sunshine and natural or man-made shade could be experienced
Topography	Flat surface with a slight downward slope towards the bottom of the playground.	Site did not have slopes or uneven surfaces. The jungle gym slides, drums and planted tyres helped with stimulation in this regard.
Surroundings	Busy road on the south side, quieter road and school parking area on the east side. Classrooms on the west side and corporate building on the north side.	The children could hear and see the traffic and pedestrians passing by.
Site furnishings	Four child-sized pieces of furniture from the playhouse that children move around the playground. Tyres around different areas providing sitting place.	Children made use of the furnishings
Play equipment	One large wooden climbing structure. One wooden structure with monkey bars, balance beam and three kinds of swings that children hang from. A-frame steel structure with climbing net. One set of tyre swings in a wooden pole structure. 3 steel climbing structures with slides of different sizes and height and two with climbing nets of different heights. Steel merry-go-round. Ball hoop. Variety of loose parts (leaves, twigs, berries,	Jungle gyms provided climbing opportunities as the trees were mostly too big to climb and it did not seem that climbing trees is allowed by staff. Swings, slides and merry-go round provided vestibular stimulation

Item	Description	Interpretive discussion about the relevance to sensory and motor stimulation on the outdoor playground
	sand toys). Scooters. Other loose parts provided on the playground such as blocks and art materials etc., but I did not observe any of these in the time I was there.	
Other features	Vegetable garden, store room. Outdoor basin. Bird cage with ornamental wire and bead birds inside. Pot plants. Rose bed. Post box.	Children could see the vegetables grow even if they did not cultivate the garden themselves
Areas/settings (see Addendum 2)	Playhouse, 3 grass areas, pathways, merry-go-round, seated tyre swing set, roller bar, big wooden climbing structure (jungle gym), shaded hanging swings, monkey bars and balance beam, sandpit, trampoline, small steel structure with slide (jungle gym), medium steel structure with slide (jungle gym), shaded pole with tyres and chains, sensory table area, long slide steel structure with climbing net, small steel hanging apparatus, shaded gathering area, vegetable garden and flower beds, A-frame steel structure with climbing net on grass, paved area and plastic mat for riding bicycles and movement activities, undercover area	There were a variety of experiences available to the learners, but the addition of more loose parts would greatly enhance the play opportunities. Great opportunities for vestibular stimulation with the different types of swings.

3.3.2.2 School 2

School 2 was established in 1937 as an association not for gain and has earned itself a reputation as one of Pretoria's leading pre-primary schools. The school offers an optimum balance between the stimulation of the children's creative potential and their emotional and social development, in preparation for the more formal academic demands of a primary school. They have a very large playground and meet the criteria for selection. A virtual tour of the playground can be found in the form of a video clip and photos in Addendum 3 on the CD.

Figure 3.4: School 2 outdoor playground

Figure 3.5: School 2 Gr R class and outdoor area

(a) Site map

The site map of school 2 shows schematic details of the outdoor learning environment layout. This gives a perspective of the site and indicates the opportunities for sensory and motor development.

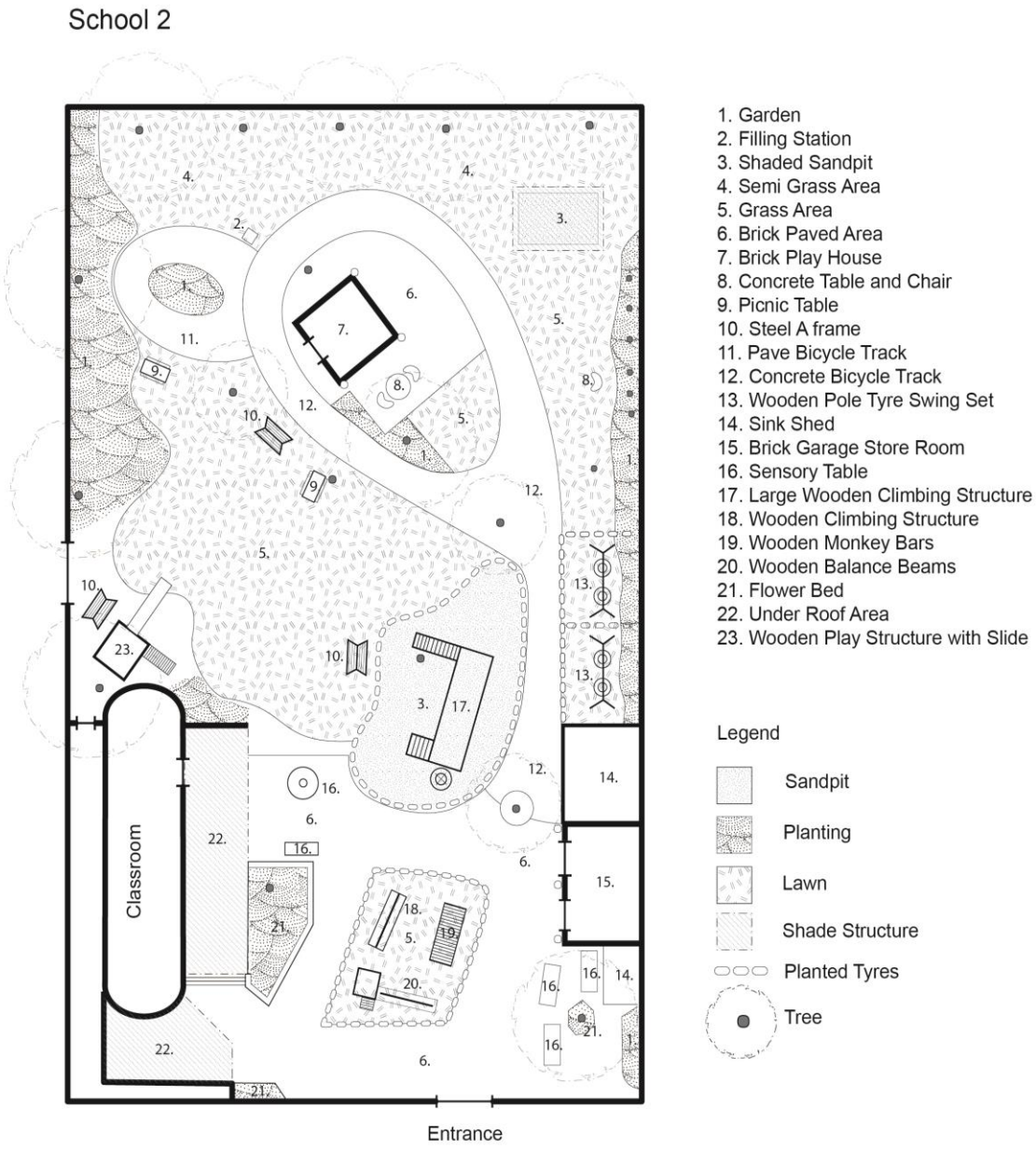

Figure 3.6: Site map of the outdoor playground of school 2

(b) Site inventory

Table 3.2: School 2 playground site inventory table adapted from Pigott (2012)

Item	Description	Interpretive discussion of the relevance to sensory and motor stimulation on the outdoor playground
Total area	Approximately 1585 m^2	The learners are privileged to have a very large playground
Open grass area	Approximately 432 m^2 grass and 120 m^2 semi-grass	The learners engaged in running freely and there was ample space to exert themselves physically
Paved space for Biking/running	Big area around most of the playground	Ample space for riding, running and walks
Ground cover	Grass, dirt /soil, paving, concrete, sand	A wide variety of sensory experiences available

Item	Description	Interpretive discussion of the relevance to sensory and motor stimulation on the outdoor playground
Vegetation	Big trees, flowering trees, shrubs, potted little trees, pot plants such as fern, lavender. Flower beds with lavender and pansies and more colorful flowers. Plastic half bottles with their own planted flowers (still in seed phase)	The children planted their own flowers in their own containers. The trees were very big and children were not allowed to climb them. Large jacaranda trees lose their leaves in autumn and blossom in spring.
Sun/shade	Mix of sun and shade, many semi-shade areas. Vast areas of sun. Several large trees that provide semi-shade.	The children experience sun, natural and man-made shade and semi-shade
Topography	Whole site slopes gradually towards the entrance of the playground.	Although the slope is gradual, it affords some uphill and downhill cycling for the bicycles
Surroundings	Busy road behind brick wall on west side. Classroom inside yard on south side in front of brick wall with busy road behind it. Outbuildings in school yard and corporate building behind concrete wall on the north side, school buildings on the east side.	Children hear traffic passing by. Children have a slight view of the street and outbuildings from the tree-house jungle gym.
Site furnishings	One adult-size cement chair, one adult-size cement table with two concrete benches. Two child-size picnic table and bench sets. Tyres around different areas providing seats. Covered veranda. Covered sandpit. Brick playhouse. Three storage sheds with movement apparatus, toys, fantasy play items etc.	Children make use of the furnishings. Large storage facilities enable the school to store a large variety of movement apparatus and loose parts such as sandpit toys etc.
Play equipment	Three wooden climbing structures including monkey bars, balance beams, treehouse with slide pole and slide. Three steel A-frame structures. Two sets of tyre swings. One hanging swing. Variety of loose parts (sand toys, tricycles, balls, hula hoops, kiddie gym, shooting stars, leaves, jacaranda twigs)	Jungle gyms provided climbing opportunities
Other features	2 flower beds with brick wall surround. Flower bed at playhouse. 2 flower beds bordering the outside walls. One flower bed next to classroom and treehouse. Pot plants around playhouse and in front of store rooms. Two outdoor taps. Outdoor basin. Tables. Art drying rack.	The pot plant that contains lavender enables children to smell its scent, the fern is prickly, the flowers are colourful
Areas/settings (see Addendum 2)	Tree house wooden structure area; open grassy area; loop bicycle track / path; undercover sandpit; playhouse; big wooden climbing structure in open sandpit; medium wooden structure with monkey bars and balance beams; sensory table areas; blackboard area; verandah; flower garden	A good variety of play opportunities were available to the learners. The different loose parts provided on a weekly basis enhance the play experiences, especially the kiddie gym

3.3.2.3 School 3

I selected School 3 because it is a well-established school that has been in existence for twenty-seven years. They are in an affluent area with a well-equipped playground and staff. A deciding factor was also that they mentioned on their website that when they developed their curriculum, they considered the following criteria:

- Children experience and learn from their environment through play
- Children's learning is influenced by the opportunities for play that are provided for them
- The child's stage of development must be taken into consideration when providing opportunities for play and learning

This fitted in well with my research. They also met all the other selection criteria. A virtual tour of the playground can be found in the form of a video clip and photos in Addendum 3 on the CD.

Figure 3.7: School 3 main outdoor playground

Figure 3.8: School 3 second playground outside the Grade R class

(a) Site map

Below is a site map of school 3 giving schematic detail of the outdoor learning environment layout. This gives a perspective of the site and indicates the opportunities for sensory and motor development.

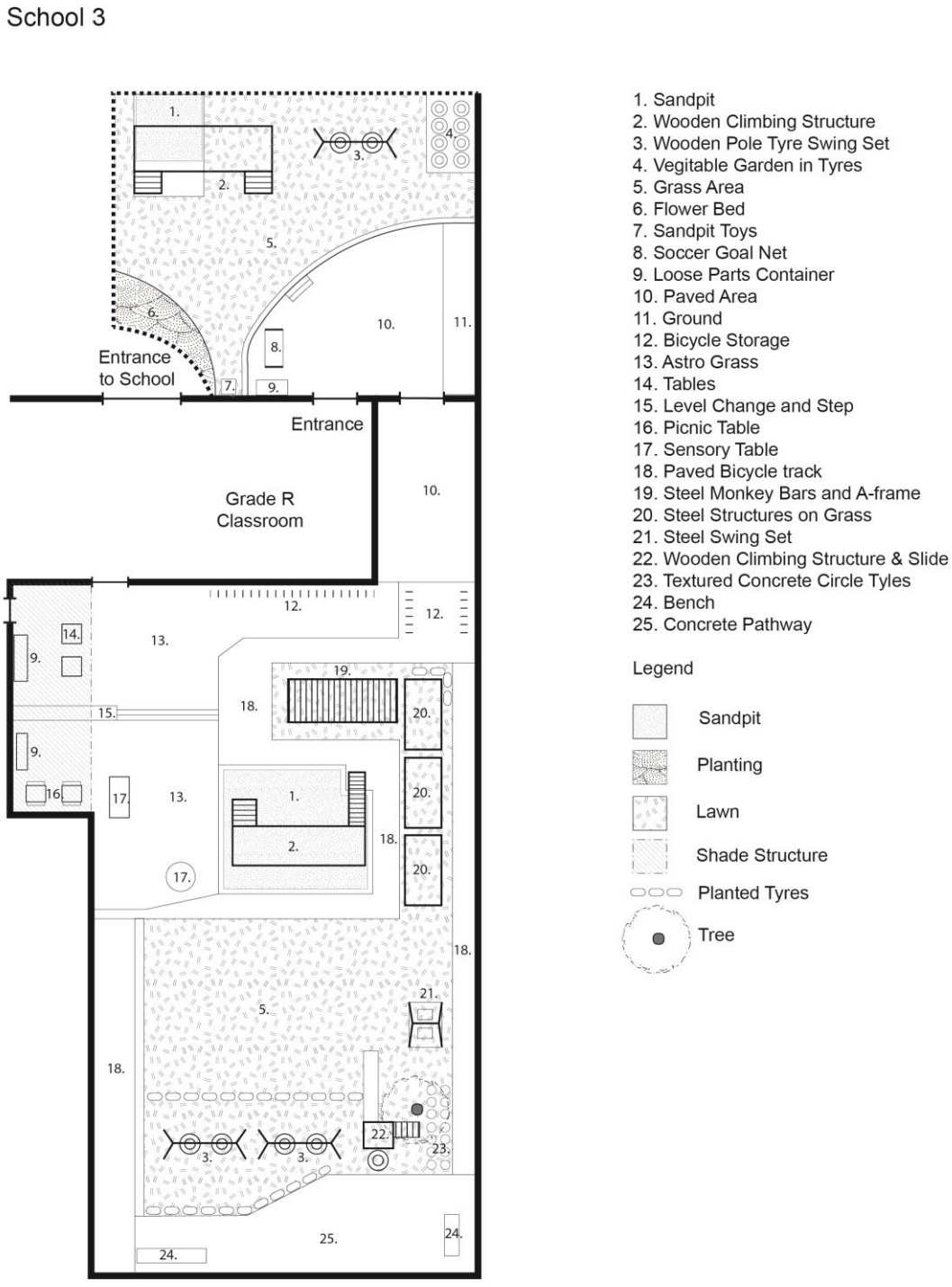

Figure 3.9: Site map of the outdoor playground of school 3

(b) Site inventory

This site inventory comprises the two playgrounds that the Grade R learners play on at this specific school.

Table 3.3: School 3 playground 1 and 2 site inventory table (adapted from Pigott, 2012)

Item	Description	Interpretive discussion of the relevance to sensory and motor stimulation on the outdoor playground
Total area	Approximately 636 m^2	The playground was a fair size for the number of children using it at a time, but certain areas such as the sensory tables seemed overcrowded
Open grass area	Approximately 298 m^2 of total playground space for both playgrounds together	The children engaged in running games
Paved space for biking/ running	Around the edge of almost the entire playground 1. Playground 2 does not have a bicycle track, but does have a fairly large paved area used for movement and ball games.	The children used the paved space for cycling and running. There was opportunity for slight uphill and downhill cycling.
Ground cover	Grass, dirt/soil, paving, concrete, round stepping stones, sand, Astro grass.	A variety of sensory experiences available
Vegetation	Only grass and one tree on playground 1. Playground 2 has some plants and flowers, a rose bush, vegetable garden, grass and a tree in the neighbor's yard hanging over that provides greenery and shade.	Children climb the small tree and balance on the trunk of the branch lying flat. Children plant and tend the plants in the vegetable garden during summer
Sun/shade	Mix of sun and shade and very little semi-shade. The playground is very open and sunny.	Children experience sun, man-made and natural shade and semi-shade
Topography	Flat surface with a slight downward slope towards the bottom of the playground. Playground 1 and 2 both have steps and a level change.	Children use their motor skills to negotiate the level changes
Surroundings	Playground 1 is surrounded by a quiet road on the front side of the school including school parking area which also borders the side of the playground. The Grade R classroom forms the border to the back of the playground and quiet residential area to the side. Playground 2 has classrooms and a toddler playground bordering two sides of the playground with quiet residential areas surrounding rest of both the playgrounds.	Children have a limited view into the neighbour's yard from the tree-house jungle gym.
Site Furnishings	Tyres around different areas providing seats. Two child-sizes benches. Adult-size chairs for teachers and staff. Three child-sized picnic table sets and one child-sized table and chairs.	Children use the furnishings
Play equipment	Playground 1: One large wooden climbing structure. One wooden structure with slide, one set of tyre swings in a wooden pole structure. One set of flat wooden-seated swings in a wooden pole structure. A-frame steel structure with monkey bars. One steel swing set. 3 steel climbing structures. Eight different types of bikes, tricycles, scooters and cars etc. Variety of loose	Climbing structures provide additional climbing activities, and pulling up the weight of their bodies by using a climbing rope on a slanted edge. Loose parts enhance the play experiences of the learners Ball skills are practised and trampoline offers jumping practice

Item	Description	Interpretive discussion of the relevance to sensory and motor stimulation on the outdoor playground
	parts (leaves, twigs, sand toys, blocks and McDonald toys). There are other loose parts provided on the playground such as water play toys etc., but I did not observe these while I was there. Playground 2: One large wooden climbing structure; one set of tyre swings in a wooden pole structure, soccer goalpost, mini-trampoline, ball hoop. Variety of loose parts (leaves, twigs, chalk, balls, rackets, sand toys).	
Other features	Storage area	Storage area enables the teachers to store loose parts and equipment that enhance the learning experiences on the playground
Areas / settings (see Addendum 2)	Playground 1: One tyre swings set and one wooden swing set both on wooden pole frame, smaller wooden structure with slide (jungle gym tree house) with tree growing next to it and laid concrete circles, big wooden climbing structure in sandpit – (jungle gym), steel A-frame, monkey bars and climbing structure, open grass area and low wall, bicycle track / pathway, bicycle storage areas, three medium steel structures, sensory table areas, bench / resting areas, steel swing structure, underroof area with picnic tables and loose parts / block area. Playground 2: Sandpit, wooden climbing structure (jungle gym), paved area, grass area, seated tyre swing set, vegetable garden, flower bed.	Swings provide vestibular stimulation. Low wall provides balancing opportunities when children walk on it, Sensory tables provide different sensory activities and water play. Sandpit provides varied sensory stimulation with the addition of water and loose parts. Vegetable garden provides opportunities to plant and grow their own vegetables, and the flower bed provides scented and coloured flowers, although it is a very small garden.

3.4 DATA COLLECTION STRATEGIES

Data gathering for this research was qualitative in nature, and therefore qualitative methods to data collection were followed. The accent of naturalistic enquiry lies in the personal interaction with the teachers instead of distant forms of data collection (Norris & Walker, 2005:133), and the preferred data collection forms were more naturalistic for this study (Burton & Bartlett, 2009:21), e.g. for the face-to-face interviews with the Grade R teachers. The data collection instruments and techniques selected are also used in a broader research approach, as are research methods which are qualitative in nature and fit into the interpretivist paradigm. Methods favoured in interpretive studies are informal interviews and observation, which allow the situation to be as 'normal' as possible (Burton & Bartlett 2009:21).

The answers to the research questions were not straightforward, and therefore a qualitative study was chosen. "Case study design includes methods to collect both descriptive and explanatory data within a study" (Creswell et al., 2007:294). The validity and reliability of the findings were checked by using multiple methods and doing cross-referencing; i.e., crystallisation was used to establish the validity of the findings.

The emphasis was therefore on collecting descriptive data (Bogdan & Biklen, 2003:50), as in-depth information was collected by applying a variety of data collection techniques over a sustained period of time (Creswell et al., 2010:293; Stark & Torrance, 2005:33; Burton & Bartlett, 2009:63). The actual settings of the pre-school case studies (Norris & Walker, 2005:133) were a direct source of data, and the researcher was the key instrument (Bogdan & Biklen, 2003:4). Table 1.1 (see p. 12) in Chapter 1 lists the most appropriate data collection techniques for this research, how the data was documented and the source of the data. As a case study researcher, I made use of multiple methods to investigate the research question. The complexity of our world and the different ways of gaining knowledge about it gives a researcher a choice to explore it from different perspectives (Creswell et al., 2010:280).

The following qualitative techniques were the primary sources of data and were used to collect the data required to address the research questions:

- Semi-structured interviews with Grade R teachers. The interviews were used for more explanatory and open-ended questions.
- Photos of playgrounds were taken.
- Video clips were taken of the playground and of how it was used.
- Field notes
- Site inventory
- Site map

I made use of these data collection methods as I needed to study the research question in depth and to probe for deeper meaning, as I was aware that things are not always what they seem and people have different opinions and experiences in the same situation (Creswell et al., 2010:45) In Chapter 1, Table 1.2 (see p. 14) stated the most appropriate data collection techniques to answer the research questions, how the data was documented and the source and purpose of the collected data. All of these data sources were analysed in order to answer the research questions.

The semi-structured interviews were conducted (Bogdan & Biklen, 2003:2) face-to-face with the Grade R teachers at each pre-school in order to gain information that had not been recorded yet regarding motor, sensory and perceptual development. Interviews focussed on the perceived sensory and motor development benefits of the outdoor playground for the Grade R learner and optimal design principles of the ideal outdoor learning environment. The interview questions were changed slightly after interview one, splitting some of the questions into two to make them simpler to answer. The interview schedule can be found in Addendum 2 on the CD.

Photos of outdoor learning environments captured details of the use and design of these environments and video clips captured teachers using them to stimulate learners' senses and to encourage movement

for perceptual development. This was cleared in the ethical application. The photos and video clips were used to complete the site maps, site inventories and rubrics.

Participant observation was done by observing how teachers employed the outdoor learning environment for perceptual development. How the children interacted with the outdoor learning environment for perceptual development was observed at the same time. Field notes provided extra information on observations while visiting the schools. Observation of children participating in outdoor activities directed by teachers or facilitators, or free play and self-exploration, provided valuable information on the use of outdoor learning environments. After the first data gathering session, I found the observation collection method for the design and use of an outdoor learning environment for whole-child development cumbersome and time consuming. I therefore combined some of the guidelines in the literature that I had used for observation into one table to simplify the data gathering process. The literature sources included are listed at the bottom of Table 3.3 (see p. 68). I also combined the table describing the features of the site with the table for sensory and motor stimulation observation that took place during breaks in the different behaviour settings.

I used the site inventory in the study of Pigott (2012) of the outdoor playground. The inventory documented the total area of the playground, open grass area, paved space for biking or running, ground cover, vegetation, sun/shade, topography, site surroundings, site furnishings, play equipment and any other features that the playground might have. I adapted this inventory to include a column for interpretation of the relevance of each item for sensory and motor stimulation in order to answer the research questions. Site maps of learning environments provided more technical information regarding the design of an optimal outdoor learning environment.

3.4.1 THE DATA CAPTURING PROCESS

The initial contact with each school was made telephonically with the principal. I introduced myself and explained what the research entailed, how it would take place and who would be involved. After establishing whether such research would be allowed at the school, I arranged a suitable date for the first introductory visit. Not all the schools I initially contacted gave permission for research to be done; four schools refused the research. I then looked for other schools that met the criteria and was pleasantly surprised at the positive attitude of some principals to the research, who also wanted to know how they could improve the learning done on their playgrounds.

During the first school visit, I introduced myself to the school principal and the Grade R teacher. I then gave more detailed background to the research and explained in detail how the research would take place. I then complied with the ethical requirements by giving letters of voluntary informed consent and assent to the principal, the Grade R teacher and the parents of all the learners that would be affected by

my observation on the playground and also letters to the children themselves. I then organised an appropriate date and time to conduct the first observations.

During the second school visit, I drew up a site plan of the entire outdoor playground. I had arranged help to take the measurements of the playground and the different areas of activity with an electronic measuring device to be more effective and accurate. I asked a young apprentice from a local construction company to help me take correct measurements of the playground and the different areas/settings with a Stabila laser distance measurer. It was a tremendous help to be two people taking measurements, as it ensured the accuracy of the site map. First I drew a detailed site map for each outdoor learning environment. My first drawing was on plain white paper, but it proved very difficult to keep the right scale. At the next school I used blocked paper that I had obtained from the construction company, and this aided me greatly in drawing up a site map that was to scale. I identified the areas that would determine the main observation areas on the site map and took photos of these areas. I made a video tour of the playground.

I then compiled a site inventory as I observed the playtime. I video recorded the playground during playtime, focussing specifically on where the children were in the respective areas. I observed the activities in the different areas, making notes and taking photos and video recordings of specific aspects that I documented. I tried to observe the teacher interacting with the learners on the playground as I did the other observations of the activity of the children. I observed how the children interacted with the playground itself and how many children in that area engaged in what activity during the observed period. I took photos to document detail. I filled in the observation rubrics during observation and after the children had gone to class. I spent quite some time documenting everything I saw on the playground. I then arranged a time with the Grade R teacher to conduct the interview.

During the third school visit I did a further site inventory for any different materials added. I again observed the activities in the different areas and took videos and photos of the children interacting with the playground to document detail. I again observed the teacher and staff interacting with the learners on the playground and added detailed notes to the observation rubrics. I was surprised at how different the playground was used on the second day of observation.

During the fourth visit to the school I had an Interview with the teacher after school. I also made use of this visit to thank all the participants in the study for their part in making the research a success. I had such a positive experience at each school that my heart was filled with gratitude for all the role players who were so helpful in every aspect.

I had to return to one of the schools to complete the interview with the Grade R teacher, as I had accidently left out one question in the interview process. She was very helpful in this regard and I was able to complete the interview without any problems. Subsequently, I relied on the data analysis process

to determine whether any additional data was required from the schools, as I tried to gather and analyse as a continuous process.

3.5 DATA ANALYSIS STRATEGIES

The data analysis was conducted concurrently with the data collection to permit adjustment of the interview protocol in order to make it more applicable to the research question. The analysis was carried out as a process of inductive reasoning. The researcher was the data gathering instrument. Due to the naturalistic aspect of the research, observation was done at the schools being researched and interviews were conducted on the premises. The data was collected at the school itself because personal interaction was necessary and because it was the most practical arrangement to be made regarding the location of participants.

The initial step in the analysis of the qualitative data was to immerse myself in the data in order to become familiar with the information. During this process all the collected data was examined, including field notes and interview transcripts, to form a clearer understanding of the information. The data was then encoded by means of content analysis, looking for specific words whereby themes and sub-themes could be identified (Creswell et al., 2010:298). Content analysis is a systematic approach to qualitative data analysis that identifies and summarises message content. It is a process of looking at data from different angles with a view to identifying cues in the text that will help us to understand and interpret the raw data. The process is inductive and interactive; similarities and differences are sought in text that would corroborate or disconfirm theory, and it is used when analysing open-ended questions (Creswell et al., 2007:101). Conclusions were drawn on the basis of similarities and differences in responses and findings.

Qualitative data was interpreted together (triangulation) once all the data had been collected, captured, processed and the results condensed (Creswell et al., 2010:297). The analysis is best done inductively (Bogdan & Biklen, 2003:50); this is more likely to enable identification of the multiple realities that are potentially present in the data (Creswell et al., 2007:37). Data analysis was an ongoing part of the research (Bogdan & Biklen, 2003:50). The data analysed was the data collected from the semi-structured interviews, the photos of playgrounds, the video clips and field notes. "Mechanically recorded materials are reviewed in their entirety by the researcher with the researcher's insight being the key instrument for analysis" (Bogdan & Biklen, 2003:4).

3.6 TRUSTWORTHINESS

Although only three cases were included in the study, the different sites enhanced the trustworthiness of the research. Each case was studied in depth. The supporting literature in the literature review also made the findings trustworthy, and the trustworthiness of the information was enhanced by collecting data from

various sources (Creswell et al., 2010:80). The validity and reliability of the findings were also checked by using multiple methods and doing cross-referencing; i.e., crystallisation was used to establish the validity of the findings. There is general agreement that using several means of data gathering techniques adds to trustworthiness of the study (Creswell et al., 2010:80). The transferability of the findings will be discussed in Chapter 5, section 5.5.1.

3.7 THE ROLE OF THE RESEARCHER

Due to the naturalistic focus of the research, theorising needed to be done with people rather than about them (Norris & Walker, 2005:133). I wanted to gain the knowledge that the teachers had about my research topic instead of determining whether the teachers were knowledgeable and applied the theories advocated in the literature. I did this by discussing the pertinent points of this study in a semi-structured interview with each Grade R teacher, getting an in-depth idea of the opinion that the teacher had on each point. I also asked the Grade R teachers informal questions when I wanted to gain more knowledge or insight on specific phenomena that I observed at their schools.

The primary goal of the research was to add knowledge to the field of research, not to pass judgment on the design and use of pre-school outdoor learning environments for sensory and motor development (Bogdan & Biklen, 2003:33). From the observations and interviews, I was able to add to the literature instead of discussing what each case study lacked in terms of the above.

This study was subjective; due to the nature of case study research, and views and opinions of myself as the researcher had an influence on the research process. I brought my own particular experience to the research (Bogdan & Biklen, 2003:50) as I own a nursery school myself. I also approached the study from a constructivist perspective, believing that reality is dynamic and independent of myself as the observer and that the participants in the study have various truths and certainties according to their perceptions and understanding (Creswell et al., 2010:81) of the subject matter.

The description of the study, the conclusions drawn and the recommendations made in the study were influenced by the assumption that I, as the researcher, made in regard to the research topic. In short, the assumption made at the outset of the study was that development would be influenced positively if teachers designed and used the outdoor learning environment for sensory and motor stimulation. This assumption is discussed in more detail in Chapter 1 section 1.2.

3.8 ETHICAL CONSIDERATIONS

Ethical approval was obtained from the University of Pretoria prior to conducting the research. During the research process I adhered to the requirements of the ethics committee. I read through and familiarised myself with the policy guidelines on the inclusion of minor children in research investigations (Human-Vogel, 2007), although I did not technically involve the children in the research process by engaging them

with questions. I avoided speaking to the children as far as possible, but I did respond to their questions. The policy guidelines were read together with the guide for ethical clearance applications in the Faculty of Education as well as relevant laws and other policies and guidelines of the University of Pretoria. It was important to make sure that the research would not affect the children or teachers negatively in any way. The only impact that I thought to be slightly negative was that one of the teachers became anxious during the interview. The rest of the research was very positive, with children engaging in their normal play and sometimes enjoying showing all their skills to the researcher. I let them show off and have fun.

The ethical application issues were attended to throughout the study. The ethical principles of informed consent, confidentiality and privacy, honesty and openness, access to findings and avoiding harm (doing good) (Burton and Bartlett, 2009: 32) were followed. All the participants in the study, such as Grade R teachers, learners and their parents/guardians at each school were treated in accordance with these ethical principles.

Informed consent was gained from everyone participating in the research as well as from the ethics committee of the University of Pretoria. I asked informed consent in the form of a letter to the principals, Grade R teachers, parents of all the children on the playground (and not only the Grade R children), and from the children themselves where they had to write their name (if they could) and make an x next to the yes or no block. Where consent was not given, children were not video recorded or photographed when they were on the playground, and in some instances the teacher had a plan to keep these children otherwise occupied, without any fuss being made about the fact that I could not include them in the study.

I explained to all participants what anonymity meant and I applied this anonymity as discussed and approved by the participant teachers, children and myself (Bogdan & Biklen, 2003:45). I explained that the study would be accessible to the participants (Burton & Bartlett, 2009:34) and the interviews with the Grade R teachers were taped openly with their consent (Bogdan & Biklen, 2003:45), although I did notice that it made some of the teachers nervous, in which case I reassured them about the use of the recording. I also paused the recording when I saw the teacher getting anxious and reassured her of her competence to answer the interview questions. I tried to keep the interview relaxed and informal and to set the teachers at ease as far as possible, as it was quite a lengthy interview but collected rich data and was a key component of the collection process. Withdrawal was possible anytime during the research process and was communicated accordingly to all involved in the study.

Respondents had the option to read the research report before publication. This also formed part of the validation process of this research and provided valuable feedback from participants on the findings and the research process as a whole. The schools involved were all keen to receive the findings of the study, as this would help them improve their own outdoor learning environments. I tried to direct the study in a manner that did not generate unnecessary anxiety, hurt or difficulty to the people involved (Bogdan & Biklen, 2009: 34). Although one teacher found it stressful to be recorded during the interview, I explained

the reason for the recording and also made sure that she felt at ease with the process throughout the rest of the interview.

The ethical consequences of the methods employed in this study were considered before they were used (Piper & Simons, 2005:59), and they were found to be ethically appropriate. The positive or negative repercussions of this research for the respondents and for the readers of the research findings (Bogdan & Biklen, 2003:45) were also investigated, and as the research focused on the contributing elements of each case study, the findings of the study could be experienced as positive rather than embarrassing for all participants.

3.9 CONCLUSION

In this chapter I presented the paradigmatic perspectives of the study. The research design and methodology were discussed, which included identifying the units of analysis and giving a description of each case study. This included a site map and a site inventory of each pre-school. Data collection strategies were elaborated upon and examples were given of instruments used to collect data. The trustworthiness of the study, my role as the researcher and the ethical considerations of the study were also described.

In the next chapter the data analysis process is explained and the results of the study are presented. I looked at how the data analysis strategies were executed and report the results gathered from the data. Themes and sub-themes emerged from this data that are tabulated and discussed in detail.

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CHAPTER 4: DATA ANALYSIS AND RESULTS

Perceptions of Grade R teachers,
observations of Grade R learners' interactions
and site analysis

4.1 INTRODUCTION

Following on the data gathering process in Chapter 3, this chapter aims to make meaning of the vast amount of data collected while documenting the results of the process in a sensible manner. The data analysis strategies were followed as explained in Chapter 3. These strategies gave direction and provided the way forward through the masses of data collected. The more immersed I became in the data (Creswell et al., 2010:298), the easier it became to combine and refine the rubrics used for data collection from the information collected. Correlations between the literature and the data were noticeable, and I was also able to identify some similarities and differences in the data itself (Creswell et al., 2007:101), although this was not a comparative study or done with the intention to compare the different sites.

After each school visit, the data was documented and compared with the data gathered in previous visits to that school or to the other schools in the study in order to detect new insights and include data I might have overlooked during previous observations. This cyclic process helped me to look for specific aspects when I visited the schools in the study again to document the information that I had missed previously. It also helped me to clarify points I was unsure of, such as the use of water play, which I had not observed before. In this way, analysis already started during the data collection process.

4.2 THE DATA ANALYSIS PROCESS

Firstly, I drew a detailed site map of each outdoor learning environment using the sketch that I had made on site, in combination with photos of each setting and a video tour of the playground as presented in Chapter 3. The photos and video clips can be found in Addendum 3 on the CD. A Harvard graduated landscape architect working in San Francisco created an electronic copy of the site map to make it user-friendly for the data analysis process. The "Whatsapp" cellphone application was very useful for sending the video tour and pertinent photos and comments of the outdoor playground of each school. I sent a scanned copy of the drawings per email, but in hindsight I could have also used "Whatsapp" effectively instead. Technology made it very easy to collaborate across the globe, and we communicated in this way until the site maps had been completed. These site maps are included in Chapter 3.

The site inventory of each school was drawn up to give further insight into the data obtained and to give context to the emergent themes. These were compiled by observing the respective playgrounds before,

during and after playtime and informally asking the teachers relevant questions pertaining to items such as the loose parts (e.g. sandpit toys) usually provided, but perhaps not taken out on my observation days. Site photos and video footage as found in Addendum 3 on the CD was also helpful in this regard for off-site investigation. The inventory was compiled over two days to ensure that no pertinent information was overlooked on the first day. All three schools' inventories are included in Chapter 3.

I had used various methods in different formats (such as tables or bulleted texts obtained from the literature) to gain rich data from each site and subsequently organised the data to make sense of what was most significant to my study. This revealed that I had too much content for this chapter. I therefore condensed the most relevant "rubrics" (Williams-Siegfredsen, 2012; Bennet, 2001; Feez, 2011; Pigott, 2012; Wellhousen, 2002; Wortham & Frost, 1990; Herrington, Lesmeister, Nicholls, & Stefiuk, n.d.; Esbensen, 1987 in Wortham & Frost, 1990; Titman, 1994 in Çorakçi, 2010; Frost, 1992 in Wellhousen, 2002 and Van Heerden, 2012) into one rubric that could be used as a general tool to evaluate outdoor learning environments for whole-child development. This rubric template can be found in Addendum 3. The data that I used in this rubric I obtained from observation, photos, video clips and semi-structured interviews with teachers. These observation tools helped me to look for data even when I was not observing on the playground, and I could go back and look for specific aspects as they arose out of a modified rubric. This data was necessary to establish what each school offered in relation to what I found in the literature to be elements of a good outdoor learning environment. The data brought aspects to the fore that I had not considered before, such as the ratio between different ground covers, for example, something that I would not have noticed if I had not looked at the rubric. The rubric of school 1 is included in this chapter as an example rubric, as there was not enough space in this chapter to include the rubrics from school 2 and 3 as well. These rubrics can be found in Addendum 3.

I combined the table of features (Pigott, 2012) of each pre-school outdoor playground in the study with my own sensory and motor stimulation table that I documented during the observed outdoor playtimes. I include a sample page of each of the three schools in this chapter, but could not include the whole table of each school as I was restricted by the space available. The features of outdoor playground settings for sensory and motor stimulation rubrics for the three schools are featured in Addendum 2 as tables 4.1, 4.3 and 4.6 respectively.

I decided to use the rest of the "rubrics" that I had obtained from the literature for general observation notes only and not as rubrics themselves. These extra "rubrics" therefore served only to aid me in my general observation, focussing my attention on points to look for that I might not have thought of while observing, such as the number of the physical elements rating scale, and also to enrich my data once again by looking more widely than the occurrence of sensory and motor stimulation. These notes were made when I described the sites in Chapter 3 presented in Addendum 6. It also provided the framework

within which to view the themes described in Chapter 4. In section 4.4 (see p. 81), I present the comparison of the sites, where I relied heavily on the observation notes and rubrics (as data collected).

I transcribed all three of the semi-structured interviews obtained from the different Grade R teachers. The interviews were very lengthy in order to gather rich data, but this made content analysis an overwhelming and difficult task. Through an inductive process (Creswell et al., 2010:37), I read through each interview and underlined the key points of each question. I typed up and summarised the key points in another document, which I then printed and analysed further for more condensed key points, looking for and analysing themes emerging from the data. I jotted these concepts on an A1 sheet in three different colours, each case study's themes in a different colour. I then grouped them under main themes and sub-themes, arranging and rearranging as I thought through the connections and wording of themes. When I had extracted these themes from the summarised interviews, I went back to the original transcripts and re-read them to see if there were any new themes I had not included in my summaries. I incorporated the additional comments of teachers and rearranged the themes again according to the newly added data. I then had another look across all the data sets of photos, video clips, site maps, site inventories, the whole-child development rubric, the table of features for sensory and motor stimulation of each pre-school in the study (Addendum 2) as well as the observation field notes again for further themes. This chapter presents the final themes.

4.3 OBSERVATION OUTCOMES FOR SCHOOL 1

The section below contains the observation outcomes of the study and consists of the rubric for features of the outdoor playground for sensory and motor stimulation, the rubric for whole-child development on the outdoor playground and general observation notes for school 1.

4.3.1 RUBRIC FOR FEATURES OF OUTDOOR PLAYGROUND SETTINGS FOR SENSORY AND MOTOR STIMULATION

The site map helped me to decide on areas and settings for observation. The observation itself gave rise to a combined rubric of the features of the different areas and the sensory and motor stimulation derived from interaction with this setting. I adapted Pigott's (2012) site feature table to form a rubric for evaluating the activity areas on the outdoor playground. This rubric evaluated what I observed the children actually engaging in, not what they could have been engaging in. Each site may offer other engagements as well, but if it is not indicated in the table, I did not observe the children engaging in such activity. This rubric enabled me to document the sensory and motor situation that occurred in certain areas of the playground because of specific features that the area possesses. Due to space constraints in this chapter, only the first page is included below as an example. The complete rubric for features of the outdoor playground for sensory and motor stimulation can be viewed in Addendum 2 and in Table 4.1 (see p. 80).

Table 4.1: Features of outdoor playground settings for sensory and motor stimulation – School 1

PLAYGROUND AREA	FEATURES OF AREA	SENSORY STIMULATION	MOTOR STIMULATION	COMMENTS
Play House 	Brick built playhouse with tin roof and concrete floor. It has child sized furniture inside. The playhouse is in a shaded area but the sun shines through in front of the entrance making the playhouse light inside.	- Visually stimulating with painted entrance to playhouse and view of activity on rest of playground through windows - Sense of inside and outside - Feeling texture of wire furniture, wooden chairs, concrete floor, painted enamel wall. - Feeling of texture of loose parts brought into playhouse such as sticks and leaves.	- Sit on chairs and on floor - Kneel on furniture, and floor - Sit on hunches - Fine motor skills, hold the loose parts such as sticks and leaves.	Children brought loose parts such as leaves and twigs inside the playhouse from the Jacaranda trees etc. Popular with both the boys and girls.
Grass area 	Almost completely semi-shade. Open grass area surrounded by a pathway.	- Visual stimulation of green grass, outdoor activity beyond school fence. - Texture of grass when collecting loose parts between the blades - Hear the wind in the trees and the outside traffic and activity	- Fine motor stimulation when picking up loose parts in grass	Grass had been replanted and was camped off at the time of observation. Picked up loosed parts in the grass from the pathways as far as they could reach without entering the grass area.
Merry-go-round 	Area surrounded by a border of colorfully painted tyres. Shade from trees and from canopy with shade net.	- Sense of movement - Feeling of cold steel, rubber surface of ground cover with hands and feet - Visual stimulation of colorfully painted tyres, view of the spinning playground when moving on the merry-go-round.	- Run on rubber surface - Sit on merry-go-round, tyres, rubber surface - Kneel - Stand on merry-go-round, rubber surface - Push the merry-go-round - Pull the merry-go-round - Hang - Crawl - Jump over tyres to enter area	The merry-go-round was used by two or three children at a time. There wasn't prolonged play in this area, but it was more a transition area to other areas

4.3.2 RUBRIC FOR WHOLE-CHILD DEVELOPMENT ON THE OUTDOOR PLAYGROUND

The rubric for the design and use of an outdoor learning environment for whole-child development is based on the theories employed in this study. These can be viewed in Table 2.2 and Figure 2.2. The literature and the data were examined through the lens of these theories and themes where identified that added to and validated the existing table of principles in the theoretical framework. The complete rubric for whole-child development on the outdoor playground can be viewed in Addendum 3 and in Table 4.2.

Table 4.2: School 1: Rubric for the design and use of an outdoor learning environment for whole-child development

	Whole-child development	Promotes whole-child development on a scale of 0-5 0 being least and 5 being most					
		0	1	2	3	4	5
Aim (Goal) The goals of an outdoor play environment are to stimulate:	Physical activity					☺	
	Self-knowledge and self confidence				☺		
	Learning how to assess risk and take challenges			☺			
	Creativity				☺		
	Aesthetic wellbeing					☺	
	Curiosity			☺			
	Learning through variety of play				☺		
	Social interactions with other children					☺	
	Interactions with and attraction to nature				☺		
	Wide variety of prolonged outdoor activity levels and activity types				☺		
	Rich and varied sensorial experiences teaching body, spatial, temporal and directional awareness					☺	

4.4 OBSERVATION OUTCOMES FOR SCHOOL 2

The section below contains the observation outcomes of the study and consists of the rubric for features of the outdoor playground for sensory and motor stimulation, the rubric for whole-child development on the outdoor playground and general observation notes for school 2.

4.4.1 RUBRIC FOR FEATURES OF OUTDOOR PLAYGROUND SETTINGS FOR SENSORY AND MOTOR STIMULATION

Due to space constraints in this chapter, only the first page of the rubric is included below as an example. The complete rubric for sensory and motor stimulation on the outdoor playground can be viewed in Addendum 2 as Table 4.3.

Table 4.3: Features of outdoor playground settings for sensory and motor stimulation - School 2

PLAYGROUND AREAS	FEATURES OF AREA	SENSORY STIMULATION	MOTOR STIMULATION	COMMENTS
Open Space 1. Kiddi Gym Day 1 	Large open grass area. Mostly sun and very little semi-shade.	- Feeling warmth of sun on plastic of kiddi gym apparatus\ - Feeling of plastic itself of kiddi gym - Feeling grass under their feet - Feeling sunshine on their skin - Feeling the wind blowing - Hear each other's voices / laughter / shouting /traffic / birds / airplane - Seeing the different colors of the kiddi gym / birds	- Squatting - Climbing over / under / through - Crawling under / through - Jumping off / over - Sliding off - Sitting on - Walking around - Carry / place / arrange / pick up - Standing on - Balancing - Running - Kneeling - Sitting on hunches - Lying down - Rolling - Rough and tumble games	Very popular area with most of the activity taking place here on day one. Children were engaged in this area for the full duration of the play break. The kiddi Gym was available to them as loose parts on this day. It consists of different foam shapes and a tunnel etc. The children pack the kiddi gym out at the beginning of break time in their own preferred style. They pack the apparatus back in the storeroom again when break time is over. They help each other carry the big pieces. This area has full sun.
2. Hoops, balls and shooting stars Day 2  	Large open grass area. Mostly sun and very little semi-shade.	- Feeling plastic of hoops and balls - Feeling tin foil of shooting stars - Feel heavier and lighter stars	- Grasping hoola hoops - Hoola-ing - Kicking - Running - Throwing balls / hoops / stars - Picking up balls / hoops / stars - Sitting - Catching - Bouncing - Hitting the ball - Carrying balls / hoops - Skipping	Climbing other structures to through the shooting stars from. The children take the loose parts to other parts of the playground.

4.4.2 RUBRIC FOR WHOLE-CHILD DEVELOPMENT ON THE OUTDOOR PLAYGROUND

Due to space constraints in this chapter, only the first page is included below as an example. The complete rubric for whole-child development on the outdoor playground can be viewed in Addendum 3 as Table 4.4.

Table 4.4: School 2: Rubric for the design and use of an outdoor learning environment for whole-child development

	Whole-child development	Promotes whole-child development on a scale of 0-5 0 being least and 5 being most					
		0	1	2	3	4	5
Aim (Goal) The goals of an outdoor play environment are to stimulate:	Physical activity					☺	
	Self-knowledge and self confidence				☺		
	Learning how to assess risk and take challenges				☺		
	Creativity				☺		
	Aesthetic wellbeing					☺	
	Curiosity				☺		
	Learning through variety of play					☺	
	Social interactions with other children					☺	
	Interactions with and attraction to nature				☺		
	Wide variety of prolonged outdoor activity levels and activity types					☺	
	Rich and varied sensorial experiences teaching body, spatial, temporal and directional awareness					☺	

4.5 OBSERVATION OUTCOMES FOR SCHOOL 3

The section below contains the observation outcomes of the study and consists of the rubric for features of the outdoor playground for sensory and motor stimulation, the rubric for whole-child development on the outdoor playground and general observation notes for school 3.

4.5.1 RUBRIC FOR FEATURES OF OUTDOOR PLAYGROUND SETTINGS FOR SENSORY AND MOTOR STIMULATION

Due to space constraints in this chapter, only the first page is included below as an example. The complete rubric for features of outdoor playground settings for sensory and motor stimulation can be viewed in Addendum 2 as Table 4.5.

Table 4.5: Features of outdoor playground settings for sensory and motor stimulation – School 3

AREA / SETTING: Playground 1	FEATURES	SENSORY STIMULATION	MOTOR STIMULATION	COMMENTS
Swing area 	One tyre seat swing set and one wooden flat seat swing set both on wooden pole frame. Area has tyre border on two sides, low wall border on other side. There is a balance stump at the end of a row of border tyres. Full sun area.	- Feel texture of steel chain, rubber of tyres, wooden seats, and wooden poles of swing structure, grass surface, motion and wind when swinging, sun shining on face. - Visual stimulation of green grass, seeing children running on playground - Hear birds, wind in trees, children singing and laughing, airplane.	- Crawl - Standing on swing and on grass - Swing - Balance / walk on tyres and low wall - Climb over tyres - Sit	Popular on both observation days.
Smaller wooden structure area 	Smaller wooden structure with slide (Jungle Gym Tree House) with tree growing next to it and laid concrete circles. Semi-shade and sun.	- Feel texture of bark of tree and smooth trunk were bark is worn off, coarse concrete circle pavers, loose parts consisting of leaves and twigs, wood of structure and plastic of slide, rubber of tyres, grass. - Visual stimulation, can see outside activity of neighbors over fence. - Feel a sense of height and can touch branches and leaves of tree - Hear the birds and children playing.	- Jump from structure and tree, jump on concrete circles with one leg, two legs. - Hang from structure and tree - Climb up and down structure and tree - Slide - Sit on tree trunk and structure - Walk - Balance - Squat / sit on hunches - Pick up loose parts with pincer grip (fine motor) - Run - Stand on two legs, one leg.	The wooden structure is next to a tree and the concrete circles are laid in the ground next to the tree. The children play on the ground beneath the structure. Tree trunk forms a balance beam. Children play hop scotch on the circles.

AREA / SETTING: Playground 1	FEATURES	SENSORY STIMULATION	MOTOR STIMULATION	COMMENTS
Big wooden climbing structure in sandpit – (Jungle Gym) 	Sun and shade made by structure itself over part of sandpit.	- Feel sense of height - Feel texture of sand, wooden structure, steel chains of ladder, rubber of tyre ladder, plastic of rope and sandpit toys. - Feel shade under structure and cold sand versus sunshine and warm sand. - Visual stimulation of colorful sandpit toys - Hear birds, wind,	- Climb up chain ladder, ladder tyres, rope. - Sit on platforms, in sand, on wall. - Lie on structure, under structure - Stand on structure platforms, under structure platforms - Hang - Walk over chain swinging bridge, on sand and surrounding wall - Kneel - Squat / hunch - Crawl - Dig with hands, fine motor stimulation - Dig with shovels, gross motor stimulation - Flick sand with fingers - Scoop sand up in cupped hands - Fine motor pincer grip of loose parts in sandpit such as leaves - Pour sand, sweep sand up from astro grass.	Quite popular area on structure and under and around structure. As the day gets hotter, the shade in the sandpit becomes more and more popular. Loose parts are sandpit toys and leaves and blocks and other loose parts also make their way into the sandpit from time to time.

4.5.2 RUBRIC FOR WHOLE-CHILD DEVELOPMENT ON THE OUTDOOR PLAYGROUND

Due to space constraints in this chapter, only the first page is included below as an example. The complete rubric for whole-child development on the outdoor playground can be viewed in Addendum 3 as Table 4.6.

Table 4.6: School 3 -Rubric for the design and use of an outdoor learning environment for whole-child development

	Whole-child development	Promotes whole-child development on a scale of 0-5 0 being least and 5 being most					
		0	1	2	3	4	5
Aim (Goal) The goals of an outdoor play environment are to stimulate:	Physical activity					☺	
	Self-knowledge and self confidence				☺		
	Learning how to assess risk and take challenges				☺		
	Creativity				☺		
	Aesthetic wellbeing					☺	
	Curiosity				☺		
	Learning through variety of play					☺	
	Social interactions with other children					☺	
	Interactions with and attraction to nature				☺		
	Wide variety of prolonged outdoor activity levels and activity types				☺		

4.6 RESULTS OF THE DATA ANALYSIS: EMERGED THEMES

From the results of the data analysis, the strategies used and the process of thematic analysis (Creswell et al., 2010:298) brought structure to the data by producing themes and sub-themes from the data. The inclusion and exclusion criteria (Middeljans, 2014:73) served to guide me in a scientific way to decide what data to include and what data to exclude as not pertinent to the sub-theme. The data presented as evidence in this chapter includes the semi-structured interviews, of which the transcripts can be found in Addendum 2 on the CD. Further data obtained from observation includes the field notes (Addendum 6), the rubric of features of the outdoor learning environment for sensory and motor stimulation (Addendum 2) and the rubric for the design and use of an outdoor learning environment for whole-child development (Addendum 3). The site inventory was presented in Chapter 3. Four main themes emerged, with several sub-themes under each. Figure 4.1 is an overview of these themes and sub-themes.

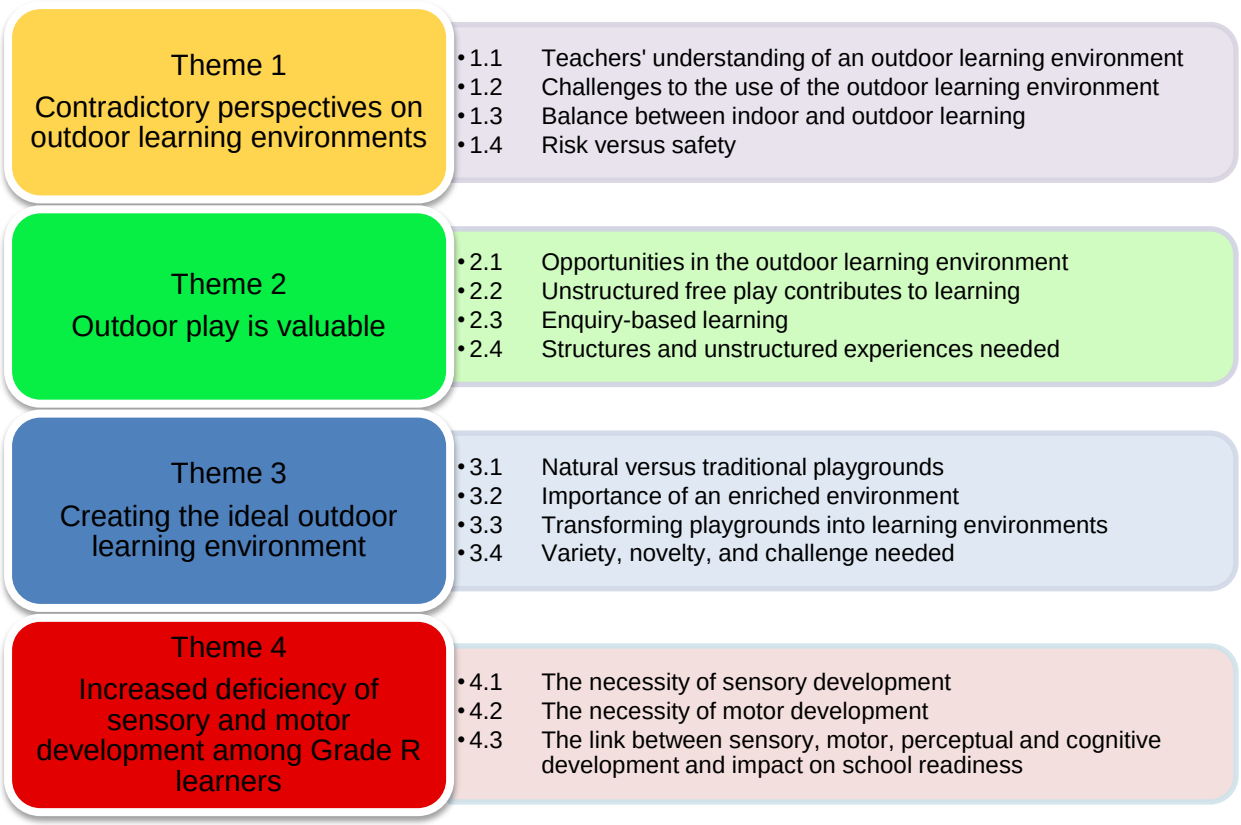

Figure 4.1: Overview of emerged themes and sub-themes

4.6.1 THEME 1: CONTRADICTORY PERSPECTIVES ON OUTDOOR LEARNING ENVIRONMENTS

Theme 1 included the contradictory perspectives of what an outdoor learning environment is. The sub-themes for this section were: 1.1 teachers' understanding of an outdoor learning environment; 1.2 challenges to the use of the outdoor learning environment; 1.3 balance between indoor and outdoor learning and 1.4 risk versus safety. The following table contains the inclusion and exclusion criteria that guided the research analysis for theme 1 and its sub-themes.

Table 4.7: Theme 1: Inclusion and exclusion criteria

Theme 1 Contradictory perspectives on outdoor learning environments		
Sub-themes	**Inclusion criteria**	**Exclusion criteria**
1.1 Teachers' understanding of an outdoor learning environment	Understandings of an outdoor learning environment that emerged from the semi-structured interview questions and across data	Any indoor or outdoor area not relevant to the study. e.g. hospital gardens or high school playgrounds
1.2 Challenges to the use of the outdoor learning environment	Any reference to challenges to using the outdoor learning environment and the solutions offered to these challenges	Challenges to the use of the classroom or trips extending further than the pre-school playground

Theme 1 Contradictory perspectives on outdoor learning environments		
Sub-themes	**Inclusion criteria**	**Exclusion criteria**
1.3 Balance between indoor and outdoor learning	Any reference to indoor or outdoor learning in the pre-school	Environments that did not relate to learning
1.3 Risk versus safety	The teachers' answers about risky play	Answers that did not relate to risk

4.6.1.1 Sub-theme 1.1: Teachers' understanding of an outdoor learning environment

The teachers in the study mostly felt that their outdoor playground was an outdoor learning environment. They mentioned that aspects such as climbing equipment and swings, a trampoline and a merry-go-round, a fantasy area, sandpit and buckets and spades constitute an outdoor learning environment. One teacher stated that an outdoor learning environment would preferably include a quiet garden and a kinaesthetic aspect, such as different textured tiles that the children could walk on barefoot. There also seemed to be a need for a weekly variation of what was provided for the children to play with.

> "…I would say like we've got on our playground. So we need all the climbing equipment and the swings, we got the trampoline and the merry-go-round…it would also be nice to have a …quiet garden where they can go with lots of little plants…have different tiles and things that they could walk barefoot on." Teacher 1 – p5.
> "…it's their playground. You must have…big equipment for them to use their bodies on…things to hang on, to swing on, to climb on…fantasy area outside…sand in the sandpit…buckets and spades…make it different things each week…garden." Teacher 3 – p11

Teacher 2 mentioned that an outdoor learning environment was a planned and structured environment in contrast to free and unstructured outdoor play:

> "…an outdoor …learning environment is when … I plan a specific lesson that takes place outside." Teacher 2 – p6
> "For me it is more structured. So it then involved very much the teacher plans things for them to do and…there's certain outcomes that have to be met… compare …to…outdoor play, outdoor play for me is free and unstructured and I don't get involved. That's their time." Teacher 2 – p6

4.6.1.2 Sub-theme 1.2: Challenges to the use of the outdoor learning environment

Teacher 1 felt that she did not experience any challenges to using the outdoor learning environment because she had freedom in her teaching strategies and enrichment of their playground was welcomed:

> "…I don't think I have any challenges …as teachers we are free to … teach how we want to teach and if we want to put things outside for them then it is welcomed." Teacher 1 – p6

The other teachers mentioned contradictory challenges: teacher 2 felt that sunburn was a potential barrier to using the outdoor learning environment, while teacher 3 felt that we were lucky to have the warmth that we get outdoors in South Africa. The site maps (Figures 3.6 and 3.9) of school 2 and 3 show that both schools have large open spaces without shade. Teacher 3 thought that the winter cold and rain were a challenge. These challenges are all weather related. This shows that the same environment can either be seen as positive or as negative. Therefore reported challenges to the use of the outdoor learning environment are very subjective in nature:

> "I don't want to go outside with them now because it is just so hot and I just worry that they are going to burn." Teacher 2 – p7
> "I think we're lucky here with the warmth, the heat that we get." Teacher 3 – p16
> "…winter… it can be freezing sometimes. So then they all have to come in, and then you have to find other things for them to do, and it's just not the same." Teacher 3 – p23
> "So winter holds us back from being outside because of the weather, its cold, when the rains come…" Teacher 3 – p23

Interestingly, only one teacher noted this as a challenge.

What was interesting was that the teacher who was concerned about sunburn also had some solutions to the challenge she experienced, which gave me the impression that it was a challenge that she already knew how to overcome, but had not really thought about before:

> "Maybe we should as teachers be putting sunscreen on before we go out for playtime…" Teacher 2 – p7
> "Maybe we need to plan activity earlier in the day." Teacher 2 – p8

It seemed that another challenge to outdoor learning was that some children became hyperactive outdoors, and learning became difficult due to overstimulation:

> "…"ADHD" children… will become very hyperactive and very excitable if I come outside too often…. they are almost like overstimulated…" Teacher 2 – p14

Another challenge that a teacher experienced was not having enough time outdoors to do everything that she would like to do in the outdoor learning environment:

> "…the biggest thing is time. Not having enough time…" Teacher 3 – p14
> "The biggest problem is time, time and fitting in everything you want to do…" Teacher 3 – p14

I noted that this teacher also used a strategy of planning carefully and adapting to overcome this challenge as far as possible:

> "…you've got to plan very carefully… you need to know what has to be taught and then work your timetable to cover what

has to be taught and make sure that it is integrated very and covers all the things we've talked about… if you can do more, then you build on that." Teacher 3 – p14

"There are some days something that you were going to do you can see it's not working and you've got to be able to switch and do something else." Teacher 3 – p14

4.6.1.3 Sub-theme 1.3: Balance between indoor and outdoor learning

The aspect that came to the fore in the data is that a balance between indoor and outdoor learning is essential and also the hallmark of a good programme:

"…we offer quite a good programme so there's learning taking place in both…we are pretty balanced with ours." Teacher 1 – p7

"I think you need a good balance, because they need change and variety…" Teacher 2 – p9

"…to be outside in the fresh air…using their bodies that way that helps them when they do have to come inside and sit. They balance each other out. " Teacher 3 – p22

What was also significant in the data was that teachers felt that children cannot only learn in the classroom or only learn outside, that you cannot only make use of one of these mediums for learning, thus confirming that a combination is essential:

"I think a combination (between indoor and outdoor learning). I don't think you can only learn inside, and I don't think you can only learn outside." Teacher 2 – p9

"The learning area should not be confined to the classroom…" Teacher 2 – p10

"…I think it is important to be outside…" Teacher 2 – p14

"…play is still a big part of our curriculum at the school." Teacher 2 – p13

"They will repeat what we've done in class but amongst themselves (on the playground) and you can listen and hear." Teacher 3 – p6

"…one can be as important as the other if they are set up in the right way that they are going to be constantly learning although they are not aware of it." Teacher 3 – p16

"Anything I do in the class, I put outside, so when it is their free time, they can actually do it all again, and play with it again." Teacher 3 – p19

"…but when playtime came, what do they go and do? (referring to something learnt in class) That's what they go and do on their own time outside, pouring the water, drawing the chalk, and I, you can hear them, because I don't want to interfere. Look at mine, mine's gone fast, where is yours going? So they start to imitate on their own. It is consolidating in their heads and helping them remember what we've learned in class." Teacher 3 – p21

"You can't have one without the other." Teacher 3 – p22

"…so the more we can be outside teaching, absolutely the better." Teacher 3 – p23

"The outside provides you with a lot that you can teach and learn with." Teacher 2 – p14

The use of the indoor and outdoor learning environment is also heavily dependent on the theme that the teacher is planning for the week:

"I think your theme and what you are learning about influences it and should influence it." Teacher 2 – p9

"I put out a specific sensory table (outdoors)…it…depends on theme and what sense." Teacher 2 – p8

"I try and use it in ways that… match the theme that we're using. So, you involve the outside with the inside in a way. (E.g. of) The water trays…" teacher 3 – p12

"So, you've got to think about what you are teaching…and what can supplement and help outside, as well as just being fun, but you are using it in a way that is complementing your classroom teaching as well." Teacher 3 – p13,14

The use of the outdoor and indoor learning environment also seems to depend on the child. There are specific instances when children with difficulties need to use the outdoor learning environment to prepare them for learning in the classroom and also to help them cope with learning during class time by taking a break and spending a few minutes in the outdoor learning environment:

"…it might depend on the child…." Teacher 1 – p7

"The reason I have the little trampoline... is because… if you have children who are struggling with things like that, if you see they can't sit or they are needing to stretch out or see they are struggling, that's one of the ways, you can send them out, just have twenty jumps, let's get things back, get our mind going." Teacher 3 – p9

"…the children that need a lot of help with their problems inside, a lot of problems like sitting at the table and holding their pencils too tightly you could help by doing exercises and having the equipment outside and letting them use their bodies helps that, and I… did say before if I see a child who I know has got particular problems, I send them outside in between what we are doing, or if I can, I'll say - take a break, run outside, run around the playground, have a swing, jump up and down on the trampoline and come back in and see how you feel." Teacher 3 – p16,17

Teachers use the outdoor learning environment to understand learners' behaviour in the classroom more completely:

"They will repeat what we've done in class but amongst themselves (on the playground) and you can listen and hear." Teacher 3 – p6

"So it (the outdoor learning environment) gives you clues…and gives you answers for things you see in the classroom." Teacher 3 – p22

4.6.1.4 Sub-theme 1.4: Risk versus safety

The teachers are in agreement that children need challenges for their development and that children must be encouraged to take risks, but that the teacher needs to be knowledgeable about what risks and challenges are age appropriate:

"…something that will challenge the children…" Teacher 1 – p 10

"Now they are in the big class so they feel confident enough to try it. ...some of them still won't want to, so you'll have to stand underneath them and kind of help them along, but once they've done it, there's a sense of achievement and confidence." Teacher 1 – p11

" For the boys I think it's important.(risky play)" Teacher 2 – p15

"…if it's a skill that you know is teaching them, they're going to a next level, you'll be aware, you'll be next to them." Teacher 3 – p23

"You've got to be able to step back and let them learn, otherwise they're not going to learn." Teacher 3 – p23

"…risk I think has to do with being sensible. Allow them to grow and to try things that are new and that they can't do. …So you need to know, well again it goes on to the development of the child. What are they able to do, what do you think- ok, let me just give them some time, I think they're going to get it, and try it and keep trying it." Teacher 3 – p24

"So to be honest I think being sensible, and knowing that development and abilities of the age groups of the children in your care and that you would have equipment that is able, that they want to use and is…age appropriate but can push each age to be able to…" Teacher 3 – p25

"So it is equipment that can let them expand …" Teacher 3 – p25

This challenge that they want to set for the children to develop is set off against safety measures, though:

"… but still be… safe enough for them to use." Teacher 1 – p 10

"….we have equipment that the children can use ...but there's safety." Teacher 1 – p11

"…obviously we want for the best interest of the child, so we don't want a child to, you know, fall and brake their arm or anything." Teacher 2 – p15,16

"But at the same time you're not, don't let them do something you know there's a good chance they're going to have an accident. …If you know this could be dangerous then you're going to say- ok, let's wait a bit." Teacher 3 – p24

"So it is equipment that can… not be dangerous…but to be aware that you're going to be, in a school like this you're gonna have children that won't be able to do everything yet…" Teacher 3 – p25

The teachers want to have control of the children to ensure safety and use rules to ensure this control. They monitor the play and decide when play is too risky and out of their control; then they will end the play or reprimand the children:

"The boys try and climb up the poles-is that really what we're going to do? And sometimes I leave them if it's just one or two then I'll just leave it, but if it's start to get, you know, it's a thing now that we want to climb up poles all the time then I'll turn on the brakes." Teacher 2 – p14

"…I allow them to have "controlled" fighting games in the classroom, but on the playground it's just a no, because in the classroom I can control it and I can monitor how." Teacher 2 – p14

"So if we play fighting games we don't punch each other in the stomach and we don't hit each other on the head kind of thing but we can almost act out the scene from Avengers that they watched last night." Teacher 2 – p15

"…the kids really know the school rules… and within the class rules you know I don't think anybody will get hurt." Teacher 2 – p15

"…on the climbing equipment…there are…very explicit rules that they know they have to follow." Teacher 2 – p15

"…there are rules for certain things…" Teacher 3 – p23

The teachers noted that they took away any dangerous elements that caused accidents in the past or that they felt might cause an accident if their use was continued:

"…we've taken away that risk." (lowered the monkey bars) Teacher 2 – p15

"…we use to have a swing that was a bit risky, they held on with their hands and they ran on the cement and then they would literally fly. And they could fly off, and we weren't comfortable with that swing. It just, it was actually too dangerous, because they would go so fast and then their hands would get uhm, and we didn't have, couldn't make it safe where it was. So that was, we felt, too risky and we actually took it out." Teacher 3 – 24

"…you have to be sensible. You know what is actually learning." Teacher 3 – 24

4.6.2 THEME 2: OUTDOOR PLAY IS VALUABLE

Theme 2 dealt with the value of outdoor play. The sub-themes for this section were: 2.1 opportunities in the outdoor learning environment, 2.2 unstructured free play contributes to learning, 2.3 enquiry-based learning and 2.4 structured and unstructured experiences are needed. The following table contains the inclusion and exclusion criteria that guided the research analysis for theme 2 and its sub-themes.

Table 4.8: Theme 2: Inclusion and exclusion criteria

Theme 2 Outdoor play is valuable		
Sub-themes	**Inclusion criteria**	**Exclusion criteria**
2.1 Opportunities in the outdoor learning environment	Positive elements experienced on the outdoor playground	Negative elements experienced on the outdoor playground. Indoor experiences
2.2 Unstructured free play contributes to learning	Any reference to free play, unstructured play, outdoor play	Structured experiences and indoor learning
2.3 Enquiry-based learning	The teachers' perspectives on enquiry-based learning and how they facilitate it. Also how it spontaneously happens on the outdoor playground.	Learning not based on enquiry
2.4 Structured and unstructured experiences are needed	Any reference to structured and unstructured experiences	Structured and unstructured experiences of children older than Grade 1

4.6.2.1 Sub-theme 2.1: Opportunities in the outdoor learning environment

Teachers noted that there are opportunities for overall development of the child in the outdoor learning environment. The site inventories (Table 3.1, 3.2, 3.3) validate the teachers' opinions in that they document rich sensory and motor stimulation opportunities in each outdoor learning environment. Examples would be the variety of ground cover for sensory stimulation at each site, wide variety of vegetation on each playground and wide open spaces at school 2 and 3 for spontaneous running activities. The rubric of features of settings for sensory and motor stimulation also validate these opportunities in the outdoor learning environment by documenting detail of sensory and motor stimulation in the different settings at the schools, but due to space constraints I cannot present them here. The rubrics can be found in Addendum

2. The photos further substantiate the opinions of the teachers by capturing the opportunities to experiment in the outdoor learning environment in Figures 4.2, 4.3 and 4.4



Figures 4.2, 4.3 & 4.4: Children doing experiments with water and sand in the outdoor learning environment

> "…on the playground…the kids are developing…" Teacher 1 – p3
>
> "…water will be out there, so they're doing pouring, they're doing mathematical skills with their pouring and things like that. When we were doing liquids we learned about the weather, we do the water cycle. So we used experiments outside. We did a lot of experiments. Anything I do in the class, I put outside, so when it is their free time, they can actually do it all again, and play with it again. So a lot of perceptual things that we can take outside I put out for later. And it's on their own, it's not me having anything to do with it. In the sandpit again, they are building, so you've got a lot of mathematical skills outside. And all the gross motor skills, they're using their imagination, they're making up their own games. So I think they are learning a lot outside if you give them the time and the freedom to. And things to use, not just nothing going on." Teacher 3 – p19

This development includes the physical development of all the motor skills of the child. The opinion of the teachers was validated in the rubric of features of settings for sensory and motor stimulation where most of the areas at each school were used by the children for sensory and motor stimulation of some sort (Addendum 2).

> "…it's to physically help…their bodies to grow… to strengthen their muscles… to allow them to use their bodies in different spaces and to help their bodies to develop in the gross motor areas but also they're using their own…ideas, their own imagination which is very important with games. So you need to have different things outside…Balls skills. If I have balls outside they will play soccer or tennis…it is really an important area. So it's important for their growth and development and…all their motor skills, not just the gross motor, all their skills." Teacher 3 – p11
>
> "…if we put balls out then obviously their ball skills will develop. So there's a different thing for skill development every day." Teacher 2 – p11

The creativity of the children develops through the opportunities afforded in the outdoor learning environment:

"You can see how the creativity is growing (on the outdoor playground." Teacher 2 – p11

There are opportunities to learn mathematical concepts in the outdoor learning environment. Figure 4.5 and 4.6 validate teachers' findings that children count with the natural loose parts that they find on the playground.

Figure 4.5: Natural loose parts collected in the outdoor learning environment.

Figure 4.6: Children counting with natural loose parts

"…we've used stones and sticks to count…" Teacher 2 – p14

"…outside on our playground …they're learning mathematical things…" Teacher 3 – p16

There are also opportunities to develop language skills:

"…language, well, they start talking as much as I do…they're using their imagination, they're making up their own games. So I think they have a lot, I think they are learning a lot outside if you give them the time and the freedom to." Teacher 3 – p19

There are opportunities for free play or play with intention:

"…on the playground I think free play is important." Teacher 1 – p 7

"…there's free play and there's play with intention and just playing for the sake of playing. So I like playing with intention. So, yes we're playing with goop but we're feeling it, we're talking about the texture of it. If I were to take for instance the goop today because now that's what we did so, if I were to do that as a sensory and a focus on a sensory stimulation for the goop, then we'll talk about the texture, what happens if you add more water or if you take some water out, how does it feel between your fingers? We'll take out a scale and weigh it. Weigh it with water, weigh it without water. What do you need to mix it? I would let them mix it themselves. And then its, we're playing but we're actually learning." Teacher 2 – p13

"…play is still a big part of our curriculum at the school." Teacher 2 – p13

There is also great opportunity to take the learning to a higher level by combining indoor and outdoor learning, because the children can physically interact with the elements that they are learning about:

"…we asked them to draw a tree inside…then we went outside…and asked them to draw a tree again and the difference between the two, the second one had all this detail." Teacher 1 – p7

"We've also got a little vegetable patch that…the Grade O are now going to…go and pull that out (a huge beetroot) because we have a thing on winter food. We're doing vegetables and soups…Mary Ann says she has a recipe for beetroot cake that they are going to make." Teacher 1 – p6

"…I think they are definitely…gonna learn through textures and smells." Teacher 1 – p 10

"So outside they're aware of the soils and the different soils, we do, do things in that, that there's sand, that there's pebbles, that there's big rocks. So we do, do that outside…we learn about grass, we learn about the plants, I use the outdoors for colours and shapes and for smells… in the sandpit, we use it when we are talking about measurement, pouring skills, uhm, we also do liquids, liquids and solids and we'd go outside and we would do liquids and solids out there. I have a great big dish that we fill up with water, and I actually have a book that I use, it's a children's book, and the children go through lots of questions in the book – why can't I , why can I and then we do them outside. So perceptual we learn about solids and liquids, and about floating and sinking. Uhm, we learn about uhm, holding our breath, what else is that other questions about, waterproof, what can soak water in, what and we actually do it and we do it outside on our playground here. We bring everything out and as a group we take turns and we act out there. So they're learning mathematical things, we're using language uhm, we're using all our sensories…" Teacher 3 – p15,16

"…we've got, all the apparatus outside, and the climbing frame and the trampoline, that kind of thing. And like I said, we also do put out uhm, construction toys, or water or sand, play dough." Teacher 1 – p8

There are opportunities for children to explore and discover on their own in the outdoor learning environment:

The function of the outdoor learning environment is: "…to provide opportunities for the children to explore and discover on their own. So it's free play, and they also develop their gross motor co-ordination and gross motor skills." Teacher 1 – p5

Opportunities for change and variety are found outdoors:

"For change, for variety, for I don't think learning has to take place in a classroom." Teacher 2 – p6

Valuable opportunities emerge outdoors during free play for the teacher to hear what the children have learnt in class:

"They will repeat what we've done in class but amongst themselves (on the playground) and you can listen and hear." Teacher 3 – p6

"So it gives you clues maybe for other things and gives you answers for things you see in the classroom. So the outdoor is very important, just as important because you get clues. It helps you and it helps them" Teacher 3 – p 22

Increased outdoor activity is healthier and therefore improves the young learners' health:

"So the more they can be outside, the better health wise…" Teacher 3 – p23

There is increased enjoyment for learners when in the outdoor learning environment, because children love to be outside:

> "So the more they can be outside…the better they enjoy it." Teacher 3 – p23
>
> "So if you can go outside as much as you can." "…if it can be outside, we use it. It is important. Children, they love the outside." Teacher 3 – p23

Objectives for outdoor play can also be planned by the teacher:

> "…the objectives (for outdoor play) come when I do the lesson, when I do the week's planning." Teacher 2 – p13

4.6.2.2 Sub-theme 2.2: Unstructured free play contributes to learning

Teachers feel that free play is important outside:

> "…on the playground I think free play is important" Teacher 1 – p7
>
> "It's very valuable to have…outdoor play." Teacher 1 – p9
>
> "…I think it is important to be outside…" Teacher 2 – p14

Teachers might feel that free play is important outside because they understand that development and learning results from outdoor play:

> "I think learning can take place outside." Teacher 2 – p6
>
> "Play…can… be free … and what, development and learning results from that? …it would cover everything. It would be perceptual development, fine motor, gross motor, cognitive, sensory." Teacher 1 – p9
>
> "…on the playground…the kids are developing…" Teacher 1 – p3
>
> "…it's to develop their gross motor skills…and again, it's going to be everything (referring to sensory, motor, perceptual and cognitive development)…they're gonna be able to explore and learn how this works or if I put his in water it's gonna float, and this is gonna sink, or this bock is too big, it doesn't fit in there,…" Teacher 1 – p9
>
> "…they can learn a lot through textures and smells and all of that."(referring to nature) Teacher 1 – p10
>
> "…hands-on learning…I think the whole playground. …their motor skills and their sensory skills are (developing) anywhere on the playground where they engage them. So you know there's different things every day for them to develop with (referring to the different loose parts and apparatus provided every day)." Teacher 2 – p11
>
> "I think our kids are very lucky to have the equipment (outdoor play equipment). So that really develops it (motor development) in an unstructured way and they don't even realize it." Teacher 2 – p3
>
> "…creativity is growing (on the playground)." Teacher 2 – p11

Teachers feel that sensory stimulation during unstructured free play contributes to learning, specifically self-directed learning. The children gain experience through exploration and trying new things on their own:

"So, a sensory activity during their free play when a teacher is not involved, they also then start to teach themselves." Teacher 2 – p2

"…any stimulation is important and all kinds of stimulation are important" (referring to sensory stimulation during unstructured free play) Teacher 2 – p 3

"Ja, it definitely does. I think it's free exploration, and, they don't, there's no structure for them. So you're not telling them how to use it or what to do…so they gain experience through trying new things and exploring." Teacher 1 – p3

"Absolutely…in the free play. Even going out to the sandpit. You can hear them repeat, going over, and we know children like going over things to make, it goes in and then it comes out." Teacher 3 – 5,6

"They will repeat what we've done in class but amongst themselves and you can listen and hear. In the sandpit, building things that we have talked about or making the animals move and do things like we had the animals out, what we've talked bout, books they've had, or stories that we've read. They re-do stories, repeat the stories. So I feel that is them on their own, when they're going over everything, and they're … re-, what's the word? **Constructed.** Yes in their head and their way and in their words how their understanding of it." Teacher 3 – p 6

Teachers feel that motor stimulation during unstructured free play contributes to learning:

"…they can kind of have a bit of a break." Teacher 1 – p7

"…get rid of all the energy." Teacher 1 – p7

"You can't make a child sit in a room for so long so they need to get out there." Teacher 1 – p7

"Ja, it definitely does. I think it is when their free creativity comes out….who is the leader….who comes up with ideas, who creates new games." Teacher 2 – p5

"Yes…I think always…." Teacher 3 – p9,10

"They love to be outdoors because they can move more." Teacher 3 – p16

Teachers have observed that learning takes place from peers during unstructured free play:

"What we've noticed a lot…the Grade R's help the double R's and also the brighter sparks in the double R class are helping the lagers in the R class (on the playground). And then it's also not learning from a teacher, it's from a peer. And they enjoy that." Teacher 2 – p3

Teachers do not interfere during free play because this type of play stimulates its own kind of development:

"…we try to let them and their creativity develop without interfering too much." Teacher 2 – p1

"…if we put out a sensory table for the playground…we…let...their creativity develop without interfering too much." Teacher 2 – p1,2

"…but when playtime came, what do they go and do? That's what they go and do on their own time outside, pouring the water, drawing the chalk, and I, you can hear them, because I don't want to interfere. Look at mine, mine's gone fast, where is yours going? So they start to imitate on their own. It is consolidating in their heads and helping them remember what we've learned in class." Teacher 3 – p21

"…on the big playground we don't interfere that much when it's free play outside. We rather watch than take part in it because they need to be able to choose themselves what they want to be able to do, they need to interact with each other and I think if they are left alone, they will tend to do that more." Teacher 3 – p9,10

"And outside uhm, it's a lot more free choice outside but ...if they are set up in the right way …they are going to be constantly learning although they are not aware of it." Teacher 3 – p16

"So the playground I try and, that's their time and they can play with who they want and what they want and however they want." Teacher 2 – p1

Teachers feel that unstructured free play complements classroom learning:

"…and if you have that outside area that they can physically use their bodies the way it needs to be used, and the children that need a lot of help with their problems inside, a lot of problems like sitting at the table and holding their pencils too tightly you could help by doing exercises and having the equipment outside and letting them use their bodies helps that. And I did, did say before if I see a child who I know has got particular problems, I send them outside in between what we are doing, or if I can, I'll say - take a break, run outside, run around the playground, have a swing, jump up and down on the trampoline and come back in and see how you feel." Teacher 3 – p16,17

Outdoor play has an influence on the learning that takes place inside the classroom

"Absolutely, absolutely yes. They cannot be stuck inside all the time…because…they still need to be moving a lot." Teacher 3 – p16

"My children who come late to school and don't have outside play in the morning struggle to get into the swing of things, because they haven't had time outside. Definitely important." Teacher 2 – p10

Teachers also acknowledge that free play is an important expression of who the children are:

"…their play…it's an important part of their expression of who they are." Teacher 2 – p14

"They learn through play. Play is their work." Teacher 3 – p12

Teachers are aware of the difference between structured and unstructured play:

"Play is, well it can either be free or it can be sort of constructive play. So you can provide the things for the children and then you can either use it in a structured setting or let them, let them explore through their own. And what, development and learning results from that? …it would cover, cover everything. It would be perceptual development, fine motor, gross motor, cognitive, sensory." Teacher 1 – p9

4.6.2.3 Sub-theme 2.3: Enquiry-based learning

The outdoor playground provides an area where children can explore concepts for themselves through the apparatus and toys provided.

"…we've got…all the apparatus outside, and the climbing frame and the trampoline…we also do put out…construction toys, or water or sand, play dough." Teacher 1 – p8

"Anything I do in the class, I put outside, so when it is their free time, they can actually do it all again, and play with it again. So a lot of perceptual things that…can take outside I put out for later. And it's on their own, it's not me having anything to do with it." Teacher 3 – p19

"…hands-on learning… I think the whole playground. Well, well their motor skills and their sensory skills are anywhere on the

playground where they engage them. So if they want to engage their gross motor, you know, they have the choice." Teacher 2 – p11

Enquiry-based learning can take place during playtime because the teachers do not interfere much, and the children can therefore do what they choose to do themselves.

"So the playground I try and, that's their time and they can play with who they want and what they want and however they want." Teacher 2 – p1

"…help them to use their own imagination or what they can do with it. Don't tell them what to do with it, but let them do it… and they will build volcanos and rocks and they will find things that you don't even know are out there perhaps" Teacher 3 – p11,12

"…there are other times that they make their own free choice." Teacher 3 – p16

"…they are allowed to choose themselves. They very often are out, most of the time they are outside, or they'll take colours or they'll play games. Whatever they are interested in, they do, but that's entirely up to them." Teacher 3 – p18

"…but when playtime came, what do they go and do? That's what they go and do on their own time outside, pouring the water, drawing the chalk, and I, you can hear them, because I don't want to interfere. Look at mine, mine's gone fast, where is yours going? So they start to imitate on their own. It is consolidating in their heads and helping them remember what we've learned in class." Teacher 3 – p21

The teachers think it is important to follow what the child wants to learn whenever they can:

"…I think it's very important to follow what the child… is wanting to learn and. Where ever you can." Teacher 1 – p9

However, teachers do not follow an enquiry-based teaching style as such, but they do embrace and facilitate enquiry-based learning on certain occasions, with some teachers embracing the teaching style more than others:

"…this building next door, there was construction taking place….And the kids were on the playground and they saw the cranes and everything and they wanted to know what's going on. So we organised a visit to the construction site where they could see those big drills and how they did all of that and then when they were finished, we went back again to see the finished building and they got to go up into the offices, see everything. It was a very nice experience for them." Teacher 1 – p9

If a child is interested in something specifically do you follow the path of that enquiry? "Absolutely." Teacher 3 – p20

"…if they can explain to me why they've brought it, where does it fit in with what we are learning about… then ok. That's absolutely fine. We can fit it on the table. I bring out my books (related to the item the child has brought). So I have a book on things like that. So I brought it out, I brought the poster out and I said well I'm not there, it's your and we'll look at it also. I do, do that." Teacher 3 – p20

"If they bring me something, I will ask them- ok, tell me why did you bring it?" Teacher 3 – p20

"…if they can think of an (laugh) answer to tell me, explaining to me why this should be allowed here, and it's a valid answer, then I will accept it…" Teacher 3 – p20

"…mine are very honest with me and I am now very honest with them – I don't know, I will look it up and tell you tomorrow." Teacher 2 – p12

"**Do you feel that you are the source of knowledge for them?** No…They come with knowledge all the time and I really

encourage it and I try to encourage my parents as well all the time. So I've had discussions with them about topics…that is not a part of our topic. For instance, the one little boy watched a movie or something with fireflies in it, and then his mom had to show him all the fireflies and that day we had to discuss fireflies because that's what he wanted to discuss." Teacher 2 – p12

"So, enquiry-based yes, we do, do a lot of that…why are things happening and I let them ask me as many questions as I am hoping that they can?" Teacher 3 – p20

"…letting them asking questions too…" Teacher 3 – p18

"…they ask me question and we will discuss it." Teacher 3 – p18

This might be because teachers feel that enquiry-based learning is challenging and that there is a possibility that they will not reach the outcomes that need to be reached for a lesson. Enquiry-based learning is therefore not preferred by teacher 2, although the same teacher encouraged it to a certain extent, contradicting her own belief:

"I think that's a challenging one. (enquiry-based learning)" Teacher 2 – p12

"The teacher needs to be on form, absolutely you need to be on top form for that. You need to know a lot about a lot." Teacher 2 – p12

"I would not recommend enquiry-based learning for somebody who has not got a lot of…general knowledge." Teacher 2 – p12

"…I would not recommend it." Teacher 2 – p12

"So to a certain extent I do encourage it, but I also do monitor it. I don't let it go too far because otherwise it, it can take over and you won't, I don't know if you , sometimes I feel like you won't get to your outcomes that you need to achieve.." Teacher 2 – p12

On the other hand, teacher 3 encourages enquiry-based learning by facilitating problem-solving scenarios:

"…problems, let them find out why have you given them this, what can they do with it. Don't give them the answers, let the find out themselves." Teacher 3 – p12

"…they have to work it out themselves, what it is we're doing." Teacher 3 – p20

4.6.2.4 Sub-theme 2.4: Structured and unstructured experiences are needed

Teachers feel that free exploration and free choice by the child are important and that you must provide opportunities for children outside to engage in activities such as art or movement:

Sensory development "…should be sort of like free exploration. I think the teacher should, like I said before, provide those opportunities, whether you're doing art or outside or movement. So I think it should be like a natural thing that's kind of free choice." Teacher 1 – p2

Teachers make use of structured as well as unstructured activities:

"… I use a bit of both. So I'll do activities where I put out for them, and they need to kind of take part. So if we do a finger painting or whatever, even if they resist, I kind of encourage them to take part... and then outside we've got sort of the free option to let them choose if it's water play or sand play or sandpit…bikes…wooden blocks…little construction things or play dough…" Teacher 1 – p2

"…we use both…structured (little obstacle courses) and free activities (free play on equipment) (as movement experiences for Grade R children's learning). Teacher 1 – p4

"Play…can either be free or it can be sort of constructive play. So you can provide the things for the children and then you can either use it in a structured setting or…let them explore through their own…" Teacher 1 – p9

"…there are times when it's I'm telling them what they can and can't do but there are other times that they make their own free choice." Teacher 3 – p15

Development results from structured as well as unstructured play:

"…you can put structured activities out…which we do…like blocks and small Lego. We've got those very big Lego blocks that we put out for them…if they wanna build something then they gonna see, they need this or that and otherwise it will fall over or it's too big or it's too small." Teacher 1 – p7

"….what, development and learning results from that?...it would…cover everything. It would be perceptual development…fine motor, gross motor, cognitive, sensory." Teacher 1 – p9

"Motor development would then be the development of their motor skills which would be gross and fine motor. So, I think it can take place in a structured and unstructured environment." Teacher 2 – p3

It seems that teachers feel that outdoor play should be more unstructured free play:

"We do a lot of…structured work in the morning, so that's why they…can just choose their own go jump on the trampoline or go do this…(on the outdoor playground)" Teacher 1 – p4

"…on the playground I think free play is important." Teacher 1 – p7

"Well if we did it on the playground, then it will have to become a planned activity. So the playground is really their free play time, and I try not to interrupt that, unless I want them to do something very specific that we've maybe discussed in class that needs to be done outside. So the playground is their time and they can play with who they want and what they want and however they want." Teacher 2 – p2

Creativity develops when there is not too much interference from the teachers in the activities of the learners outdoors:

"…we try to let them and their creativity develop without interfering too much." Teacher 2 – p1

The unstructured activities help the children to consolidate what they have learnt in class and are an expression of who they are:

"I don't like interfering in their play because I feel that it's an important part of their expression of who they are." Teacher 2 – p14

"…but when playtime came, what do they go and do? That's what they go and do on their own time outside, pouring the water, drawing the chalk, and I, you can hear them, because I don't want to interfere. Look at mine, mine's gone fast, where is yours going? So they start to imitate on their own. It is consolidating in their heads and helping them remember what we've learned in class." Teacher 3 – p21

4.6.3 THEME 3: Creating the ideal outdoor learning environment

Theme 3 covered the creation of the ideal outdoor learning environment. The sub-themes for this section were: 3.1 natural versus traditional playgrounds, 3.2 the importance of an enriched environment, 3.3 transforming playgrounds into learning environments and 3.4 the necessity of variety, novelty and challenges. The following table contains the inclusion and exclusion criteria that guided the research analysis of theme 3 and its sub-themes.

Table 4.9: Theme 3 inclusion and exclusion criteria

Theme 3 Creating the ideal outdoor learning environment		
Sub-themes	**Inclusion criteria**	**Exclusion criteria**
3.1 Natural versus traditional playgrounds	Any reference to the benefits of nature, natural elements, and benefits of traditional playgrounds	Any other types of playgrounds
3.2 The importance of an enriched environment	Any reference to the importance or benefits of an enriched environment	Indoor environment
3.3 Transforming playgrounds into learning environments	Any reference to what an ideal playground should contain. Also any advice on planning the playground.	Any elements that are not related to the outdoor learning environment
3.4 The necessity of variety, novelty, and challenges	Any reference to variety, novelty and challenge	Elements that are not related to variety, novelty and challenge

4.6.3.1 Sub-theme 3.1: Natural versus traditional playgrounds

Teachers feel that it is important for children to spend time in nature and that children should be in nature as much as possible:

Benefits of being in nature and does natural elements have an influence on play and development? "Well ja it is important. You saw yesterday with the children how they collected the berries and ja it was a whole game for them." Teacher 1 – p 10

"…the more natural you can go the better." Teacher 1 – p10

"Nature is very important…. If you can, have nature outside, anywhere you can." Teacher 3 – p22

This could be because they feel that children can learn through nature and being outdoors:

> "…the little ones were using the leaves as telephones…it is important, and it is important to make the children aware of what's outside and how to look after your environment and that kind of thing. And they can learn a lot through textures and smells and all of that." Teacher 1 – p10
>
> "…I think they are definitely…gonna learn through textures and smells and I think…the more natural you can go the better." Teacher 1 – p10
>
> "…there are benefits of being in nature…we've used stones and sticks to count before…I think you can learn from nature. We've sat outside and listened to the wind and tried to listen to the birds… it is important to be outside…The outside provides you with a lot that you can teach and learn with." Teacher 2 – p14
>
> "Nature is very important. I mean your themes are nature. You know with autumn we go out for walks, we do rubbings on the tree trunks, we collect all the things going around. It's part of their understanding of the world around them. It's helping their senses to understand what am I seeing, let me feel it. If you can, have nature outside, anywhere you can." Teacher 3 – p22

Although the teachers feel that children should be in nature as much as possible, they feel that both the natural and the traditional playground are important. There is a need for a combination of natural and traditional playgrounds:

> "…they are both important (natural and traditional playgrounds). If you can have all of it, that's the best scenario… if you can't, try and have…as much as you can. They need to be physically moving, they need to be using every part of their body, so, jungle gyms are important. If you've got a big tree…that is wonderful. If you don't…then we use jungle gyms instead..." Teacher 3 – p22,23

Teachers even feel that children are lucky to have only a traditional playground, although the benefits of the natural playground are incomparable because it incorporates nature itself:

> "Look, I think if all you have available to you is the steel and the traditional stuff, then I don't think it's going to harm the child, I think you are lucky to have it." Teacher 2 – p14
>
> "But to actually see it living, you know, you can't compare touching the grass and a tree trunk to talking about it, seeing a picture or even watching it on TV. It has to be the real thing." Teacher 3 – p23

4.6.3.2 Sub-theme 3 2: The importance of an enriched environment

Teachers feel it is important and necessary to have an enriched environment because it gives children the opportunity to learn on their own:

> "…it is important to have an enriched environment…" Teacher 1 – p5
>
> "It must be enriched… (Referring to the outdoor playground)." Teacher 3 – p12

They possibly feel this way because children learn through play, which means that an enriched environment could lead to enriched learning experiences:

"…the more equipment you have, the more opportunities you give the children to learn on their own." Teacher 1 – p5

"It must be enriched because they are learning all the time, learning should never stop." Teacher 3 – p12

"They learn through play. Play is their work…" Teacher 3 – p12

Grade R learners in particular need many new experiences:

"…especially Grade R's…can come to you and say – I am bored. If they have done the same old thing over and over and over again. So they are actually looking for new experiences…once we get…the vegetable garden going, I know they will be focused on that vegetable garden for quite a long time, because it's something new, they're learning about new things. So you should enrich it in the sense that they can be experiencing new things all the time, or building on what they know and furthering it, because children want to learn. They want to see new things, they want to learn more." Teacher 3 – p12

"So you need to provide more for them, even if it problems, let them find out why have you given them this, what can they do with it." Teacher 3 – p12

"…we don't want them to just be not learning." Teacher 3 – p12

The use of loose parts such as the kiddie gym or balls and hoops provide change and variety on the playground, thus enriching the environment and resulting in increased creativity among the learners:

"…it never stays the same. You can see how the creativity is growing."(referring to the playground when adding different loose parts such as hoops and balls) Teacher 2 – p11

4.6.3.2 Sub-theme 3.3: Transforming playgrounds into learning environments

Teachers feel that it is definitely possible to transform playgrounds into learning environments:

"Ja, ja you can do lots, definitely." Teacher 1 – p6

"…yes it is practically possible. It depends on teacher to teacher..." Teacher 2 – p7

"I think it's very possible and it's practical if you make it practical..." Teacher 2 – p7

"It is…(possible to transform outdoor spaces into learning environments)" Teacher 3 – p12

Transforming the playground requires much planning and out-of-the-box thinking. You have to determine what is available and you also need to work with what you have:

"…you'd have to sit down and plan, definitely plan and have a look at what is available." Teacher 1 – p7

"…you have to think outside of the box and you obviously have to work with what you have..." Teacher 2 – p7

"…you've got to plan very carefully…." Teacher 3 – p14

Good planning can help reduce the cost of transforming the playground. Transforming the playground need not be expensive, and a lack of funds should not be seen as a limiting factor. Neither should the lack of a garden or equipment be seen as a limiting factor:

"…you really have to think out of the box, otherwise it can get very, very expensive…" Teacher 2 – p9

"I think you can make your outdoor playground enriched with very little resources." Teacher 2 – p6

"Equipment should not limit you to going outside." Teacher 2 – p7

"So it doesn't have to be expensive toys or anything like that. Give them a yogurt container, give them a teaspoon…or just give them water. And right now, you can just give them water with the sand and they won't ask for anything else because they're so happy just to have the different thing." Teacher 3 – p12

"So if you even have cement and no garden, you could make a garden, by using tyres, by using buckets and putting things in. So there's always a way to make something!...if you haven't got sand, if you've just got a place of soil, children love playing in the mud too…and you can use old tyres, old tyres are everywhere, to mark little areas off. So I don't think you can say – I can't do it, I don't have anything out here. There's always a way to make, especially outdoors, a fun place. And it doesn't have to be in an expensive way, there is always something you can do. You, you can use chalk, you can use paint, you can use black board paint and make an area of the wall into a blackboard." Teacher 3 – p12,13

The potential for transformation depends on the teacher:

"It depends on teacher to teacher…" Teacher 2 – p7

The teachers mentioned elements that needed to be incorporated into the playground when transforming it into a learning environment. Provision for free play must also be included:

"I would like that little garden with different plants and textures and smells, and also then the tiles. Something sensory for them so they can walk on or crawl into." Teacher 1 – p6

"We've also got a little vegetable patch." Teacher 1 – p6

"I think you can get so many different sort of equipment and things to crawl through and under and over." Teacher 1 – p7

"I think I'll put some shade up somehow." Teacher 2 – p8

"So, I would put sensory tables…with a roof over it, like that we have over the sandpit…so that it doesn't get so dirty and then you can have it out for longer. I would have four to five sensory tables out with different, maybe a sense per table, then you could do five tables…" Teacher 2 – p9

"And sand…go dig it out a river or something where you get it for free…chuck some salt in it and it's sterilized. But I think you can do a lot with sand, so a sandpit is very important. Obviously you have to make sure you clean it and it stays healthy. And then climbing and like the monkey bars and the balance beam as fixed structures are so, so helpful, because then you don't have to drag a balance beam around and you don't have to figure out how you are going to make it higher. So I think fixed monkey bars or balance beam and a swing, I think those are really important. And our swings are cool. They have tyres. You don't have to go and buy the fanciest swing. A decent old second-hand tyre is fine." Teacher 2 – p9

"…you can put structured activities out…like blocks and small Lego. We've got those very big Lego blocks that we put out for them…if they wanna build something then they gonna see, they need this or that and otherwise it will fall over or it's too big or it's too small." Teacher 1 – p7

"…on the playground I think free play is important." Teacher 1 – p7

"You must have…big equipment for them to use their bodies on…things to hang on, to swing on, to climb on…fantasy area outside…sand in the sandpit…buckets and spades…make it different things each week…garden." Teacher 3 – p11

"…make a little vegetable garden…inside the tyres…because if it is just spread out …they tend to walk on things…if you have it in a coloured tyre, they focus more on, and it's a particular vegetable in there." Teacher 3 – p13

"They love balls, they can play with balls all the time." Teacher 3 – 13

"…big balls and tennis balls…" Teacher 3 – p14

"…the balls do go flying everywhere because they are strong. We need more space." Teacher 3 – p13

"…they like to kick, they like to move their bodies, they need to have swings, they need to be able to move, they need to have a sandpit. I think a sandpit is very important if you can have it. Even if it is a small one. Have something with sand" Teacher 3 – p13

"…a lot more garden with flowers and vegetables and things that you can use in a sensory way just in the garden. So if I had space for gross motor skills, where they can play soccer, where they can play tennis, and enjoy that, where we can…do water play on there and chalk and everything like that. If I had more space that I could have bikes and scooters as well… and our swings, I would love to have a section that wasn't just a seasonal vegetable garden but flower. We do plant flowers, but we haven't got as much space as would love to. We could make patterns with flowers…we could just do a lot more with that and smelling." Teacher 3 – p 15

"…have more plants… your succulents, your cactus…a garden section, a sandpit section, your swing and your gross motor, your jungle gyms, things like that. Uhm, and your open area for bikes and scooters and balls and games and things like that, and your water play." Teacher 3 – p15

"…if you haven't got grass, you can always buy pot plants, you can find things to show green grass. Colours that they can feel because you want their senses to be involved outside. They have to feel nature, they have to be able to smell it and see it." Teacher 3 – p22

"If you can, have nature outside, anywhere you can. If you have just a concrete playground try and get parents to donate things that you can have flowers for colours and smells and understanding the growth from a seed into a plant." Teacher 3 – p22

Important advice that came to the fore was that children need to experience new things outdoors all the time, and everything that you incorporate into the learning environment must be such that you can build on it –

"Everything should be able to build on, whether it is inside the classroom or outside." Teacher 3 – p11

"So you should enrich it in the sense that they can be experiencing new things all the time, or building on what they know and furthering it…" Teacher 3 – p12

"…if you can do more, then you build on that." Teacher 3 – p14

– that learning should be fun

"…it must be fun… movement gets very exciting...it has to be exciting and it has to keep them going" (movement experiences for learning) Teacher 2 – p4

"So it must be a learning environment for you but a fun environment for them, that they're not actually aware that they are learning all these things." Teacher 3 – p12

"Learning is fun, learning should always be fun." Teacher 3 – p12

"…as well as just being fun..." Teacher 3 – p13,14

– and that the outdoor learning environment must complement classroom teaching.

"I try and use it in ways that…match the theme that we're using. So, you involve the outside with the inside in a way. The

water trays…" teacher 3 – p12

"So, you've got to think about what you are teaching, what your teaching the particular class is and what can supplement and help outside, as well as just being fun, but you are using it a way that is complementing your classroom teaching as well." Teacher 3 – p13,14

Natural playground and traditional playground elements are needed for the ideal outdoor learning environment:

"…they are both important.(natural outdoor learning environment with traditional equipment such as climbing structures) If you can have all of it, that's the best scenario. Uhm, if you can't, try and have as, try as much as you can. They need to be physically moving, they need to be using every part of their body, so, jungle gyms are important. If you've got a big tree…that is wonderful. If you don't that's, then we use jungle gyms instead..." Teacher 3 – p22,23

4.6.3.4 Sub-theme 3.4: Variety, novelty and challenge are necessary

The ideal outdoor learning environment must include variety, novelty and challenges for the children to gain experience by trying new things and exploring:

"…something that will challenge the children …" Teacher 1 – p 10

"…they gain experience through trying new things and exploring." Teacher 1 – p3

"I think variety is the most important." (referring to sensory experiences) Teacher 2 – p2

"For change, for variety, for I don't think learning has to take place in a classroom." Teacher 2 – p6

"…they need change and variety…" Teacher 2 – p9

"…outside… We challenge them to find a new purpose for something." Teacher 2 – p12

"…a new area will open up to them, and we will start changing and having new things out there." Teacher 3 – p15

This applies especially to the Grade R children:

"…especially Grade R's…can come to you and say – I am bored. If they have done the same old thing over and over and over again. So they are actually looking for new experiences….once we get…the vegetable garden going, I know they will be focused on that vegetable garden for quite a long time, because it's something new, they're learning about new things. So you should enrich it in the sense that they can be experiencing new things all the time, or building on what they know and furthering it, because children want to learn. They want to see new things, they want to learn more." Teacher 3 – p12

You can ensure these experiences by adding on and building on what you have available to you:

"So if you can, add on and you can build on again…" Teacher 3 – p11

"So you need to have an area that can be built on again. Everything should be able to build on, whether it is inside the classroom or outside. It's not just – o here is the sandpit again, what are we going to do today? You can start with nothing in the sandpit, and then the next day add water to it, and then the next day add the animals to it, and then the next day add something else to it, and help them to use their own imagination or what they can do with it." Teacher 3 – p11

4.6.4 THEME 4: Increased deficiency of sensory and motor development among Grade R learners

Theme 4 included the increased deficiency of sensory and motor development among Grade R learners. The sub-themes for this section were: 4.1 the necessity of sensory development, 4.2 the necessity of motor development and the 4.3 link between sensory, motor, perceptual and cognitive development and its impact on school readiness. The following tables contain the inclusion and exclusion criteria that guided the research analysis for theme 4 and its sub-themes.

Table 4.10: Theme 4: Inclusion and exclusion criteria

Theme 4 Increased deficiency of sensory and motor development among Grade R learners		
Sub-themes	**Inclusion criteria**	**Exclusion criteria**
4.1 The necessity of sensory development	Any reference to the importance and effects of sensory development and underdevelopment	Any other types of development
4.2 The necessity of motor development	Any reference to the importance and effects of motor develop-ment and underdevelopment	Any other types of development
4.3 The link between sensory, motor, perceptual and cognitive development and its impact on school readiness	Any reference to the link between these areas and the impact on school readiness	Any mention of school readiness difficulties due to more serious learning disabilites such as physical impairements or cerebral palsy

4.6.4.1 Sub-theme 4.1: The necessity of sensory development

Teachers agree that sensory development is important for children:

> "Oh, sensory development is very important. It must take place…" Teacher 2 – p 2
>
> "So, the sensory areas are very important." Teacher 3 – p2

They possibly think that it is important because sensory development has a significant influence on learning:

> I think that is how the children…learn…. " Teacher 1 – p1
>
> Sensory development influences learning because…"…the children can explore...go at their own pace and choose what they want to do. So I think ja." (that sensory development influences learning) Teacher 1 – p2
>
> "It has a huge effect on learning." Teacher 2 – p 2
>
> "…learn about the world through their senses." Teacher 3 – p1

Provision must be made for children to enjoy sensory experiences in order for sensory development to take place:

> "So you have to provide in your classroom situation or outside you need to provide all those things for them where they can experience the different sensory activities and things like that." Teacher 1 – p1
>
> Sensory development "…should be sort of like free exploration. I think the teacher should… provide those opportunities, whether you're doing art or outside or movement. So I think it should be like a natural thing that's kind of free choice." Teacher 1 – p2

Exposure to sensory experiences shows teachers whether sensory development has taken place as it should have or not:

> "You can pick it up.(lack of sensory development)" Teacher 1- p2
>
> "Like if we do finger painting, something like that, and the children don't want to get dirty or they don't like the feel of something, then, then you can pick it up (lack of sensory development). That's why it is important to have all those activities and exposure cause then you as the teacher can see." Teacher 1 – p2
>
> "If the child with developmental problems, their senses are underdeveloped or overdeveloped as I said before where you are going to see it within the activities that you are giving them that they're not able to." Teacher 3 – p2

The teachers look for specific aspects of sensory development in the young learners:

> "I am looking at their finger muscles, are they holding their pencils correctly…" Teacher 3 – p6
>
> "Every different part of a child's life, their body should be able to do more." Teacher 3 – p7
>
> "…we have our averages that we know we are expecting to see…" Teacher 3 – p7
>
> **"**We generally see the…lack of sensory development already in the double R class. So we have children that are then over or under sensitive…So we have our sensory seeker who then is, they will do things like they hit the dollhouse door too hard when they close it or they keep bumping into children. And then the …sensory avoider…will not want to take part in the texture tables and they will rather want to play by themselves because it's all just too much for them. **And that's how you will establish if there might be underlying developmental delays.** …It definitely is one of the things that we notice. Ja…that's the most one that we really notice." Teacher 2 – p 2

Teachers experience a significant amount of sensory developmental deficiencies amongst their learners, and this has increased lately:

> "And you very often have children, especially these ones these days, the new big problem is the sensory areas, the sensory development where they're overstimulated or one in particular is lacking and it has a great impact on their ability to do things." Teacher 3 – p1
>
> "I think sensory integration is very important for us because we see a lot of our kids struggle with that. We try and bring a lot of sensory integration in." Teacher 2 – p10

Sensory underdevelopment manifests itself in aspects such as a dislike of clothing or finger painting etc.:

> "Like if we do finger painting, something like that, and the children don't want to get dirty or they don't like the feel of something, then you can pick it up (lack of sensory development). That's why it is important to have all those activities and exposure cause then you as the teacher can see." Teacher 1 – p2
>
> ""I find with a lot, some of the children, there's one boy specifically in my class who…doesn't like things on his feet." Teacher 1 – p2
>
> "They are the ones that are running around and bouncing off the other kids and generally the kids then don't wanna play with them because – that child is rough with me…that's the sensory seeker. The sensory avoider, they don't wanna take part in some of the activities because they don't like the senses. To them it is overstimulation. So if we do like finger painting then they don't like that. If it's a touch thing, if it's a noise thing they don't want to take part in the music activities. If it's visual, they don't like collages and stuff cause it's just too busy for them. They also don't like the room being very lit sometimes. And it also affects how we put up artwork. So it (sensory development) has a huge impact on their learning and development in the classroom." Teacher 2 – p 2
>
> "Children who are…sensory seekers are often the ones that are being labelled as the bully, especially here on our playground they tend to be more rough and they're always the ones that are being reprimanded for being too rough and be careful, keep your hands to yourself." Teacher 2 – p2
>
> "It they're not able, especially if we're teaching it and if you see that they're not able to do particular work, then maybe those senses aren't developing. I child who can't do planning, maybe there is a sensory problem with the eyes, that their eyes aren't developing or that they can't focus, or the, the feeding from the sensory information they're getting is not working properly in their brains. The wires are getting crossed…" Teacher 3 – p2
>
> "Hearing, they're not hearing you. You can have hearing problems, it can be tone, not necessarily that they can't hear you and following instructions, they're not able to take in that information and that sense isn't able to take the message to the brain. So it's learning through their senses, taking that information from the world, whether it's touch or smell or hearing or all of these skills and not being understood by the brain and not being able to translate it properly by the brain and then coming back out again in a way you'd expect them to that – I can hear you, I can remember the words, I can follow an instruction." Teacher 3 – p2
>
> "…children who are oversensitive in many areas and then you get that crashing syndrome where they will crash into another child, and we're all saying – Stop banging, or crashing or pushing – and they're actually not aware of it. They don't realize that they're falling on top of someone. So their ability of feeling, you'll find them leaning against the wall and we're also, we teachers will say – stand up – but they need to use the wall, they need to use the furniture to be able to know where they are in the classroom or at home or wherever they are. Noise, obviously school is very noisy …in the classroom it could get too noisy and he would cover his ears. With the senses we have the problem with my classroom in particular is very colourful and busy and I know for a lot of children it can be too much. And they need a quieter space with not so much colour going on… tactile problems with oversense, touch is actually almost painful for them…" Teacher 3 – p1,2
>
> "So, then you see who can come up with a new game and who gets stuck and just wants to play the same thing over and over and over and over again.(on the playground)" Teacher 2 – p5

Appropriate sensory development would ensure that the senses are not over- or understimulated. The teachers therefore try to give appropriate stimulation to help the children who show sensory deficiencies. Figure 4.7 and 4.8 are examples of teachers' efforts to encourage learners to engage in sensory play.

Figure 4.7: Children engaging in sensory stimulation in the sandpit

Figure 4.8: Children engaging in sensory stimulation with goop

"Sensory development would be the development of the child's senses, so that they're not over- or understimulated." Teacher 2 – p1

"I do a lot like with the kids that have a lot of tactile sensory problems, I try to get them into the sandpits and stuff a lot to just to feel…" Teacher 2 – p8

"You have to be aware of the problems with the sensory areas, at the same time the general stimulation and encouragement and helping them to understand to use them, so that they can grow and develop and be able to understand the world around them better." Teacher 3 – p2

"…are all their sensory areas…in place…because if they are not, your learning is going to be compromised a great deal." Teacher 3 – p8

Teachers noted that sensory development affects what children are able to accomplish in class:

"…, it will effect what they're able and not able to do in the classroom. And unfortunately, the higher up in school they go, the harder it will then get for them" Teacher 3 – p3

"The more that they're not at the level expected of them, the harder it will get or the more they will fall behind or even be lost in the classroom. So I think all…areas of sensory development are important…" Teacher 3 – p3

4.6.4.2 Sub-theme 4.2: The necessity of motor development

Teachers feel that motor development has to take place in the young learners:

"…motor development does need to take place…especially in the Grade O…" Teacher 1 – p4

"… (Motor development) has to take place." Teacher 3 – p8

They might feel this way because motor development is important for aspects such as writing skills and to help children to concentrate longer while sitting still and focussing on what is being taught:

"…if they are doing writing and things like that, their fine motor skills need to be developed so that they can do the letter formation, the cutting, and all that kind of thing. Writing cutting, gross motor, co-ordination." Teacher 1 – p4

"Ok. So, upper body development, so shoulders and arms are necessary for writing skills. The core is necessary to be able to sit on their chair correctly. Legs, just I think generally motor development is so important because it helps then to not become so tired. So motor development really influences their ability to amount of time that they can sit and focus on the activity." Teacher 2 – p4

Teachers are aware that children's bodies should be at a certain level of growth and development. Muscle tone is a big concern to the teachers, and they check to see that the fine and gross motor skills are in place:

"…their physical bodies should be at a certain level of growth and development…they should be able to use certain equipment outside and understand how to use it and be able to use it. Like your bikes." Teacher 3 – p22

"…are all their gross motor, their fine motor areas in place…" Teacher 3 – p8

"One of the key things for me in the classroom is can the child sit on the carpet with their legs crossed. That's a big thing. If they can do that then we move on to the chair. Can they sit on the chair? Can the sit up straight? Can they sit on the chair for at least 15 minutes to complete their activity without falling off it or ending up like they're watching TV in front of their table." Teacher 2 – p4

"…one of the big areas that I think is of concern is, can children sit on their chairs for, even actually on…when we're sitting having group time on the carpet. We know that muscle…tone is one of the big problems that have been for a long time." Teacher 3 – p7

"…that's how our bodies work. We need to do certain skills in life…" Teacher 3 – p8

Teachers noted that problems resulting from lack of motor development included aspects such as lack of concentration and compromised learning because the children are too tired to focus:

"…your learning is going to be compromised a great deal." Teacher 3 – p8

"So it's important as all areas that we need to reach a certain level. When they don't…it does cause problems. Mainly in the Grade R's its tiredness will come out of it. If those muscles, those core muscles aren't strong, and you know it starts up, it's into their shoulders and out and they get tired much quicker. If they're tired, they can't focus, they can't listen to what you are saying, and in the end they will close down and no learning will take place." Teacher 3 – p8

"…if they don't have good posture… at the table, if they've got low muscle tone…it's gonna influence the period of time that they can sit at the table, the concentration on the carpet." Teacher 1 – p4

"You see the children press too hard, who get tired too quickly and then you know it's all coming from muscle development." Teacher 3 – p8

"No we usually say- sit, cross legs and hands on knees. And a lot of the time you will see that the children…start to lean back and they're not sitting maybe as long as you'd expect them to be able to sit. So they start leaning back, they start putting their hands down for stretching, they start putting their legs out. That's one of the areas …and then you know- ok we've got a muscle concern." Teacher 3 – p7

"So the children with low muscle tone, and we have quite a few children with low muscle tone, they are by, we start a lesson at nine, by half past nine they are slomperdecking in their chair and falling over…or they have to stand up because…they are so tired…if they're going to sit they're going to almost fall asleep." Teacher 2 – p4

Teachers try to rectify the lack of motor development among the learners by introducing core exercises and letting the children do much climbing. Figures 4.9 and 4.10 are examples of places where teachers encourage children to climb for exercise.

Figure 4.9: Children engaging in climbing exercises on the monkey bars

Figure 4.10: Children engaging in climbing exercises on the jungle gym

> "And we've now introduced core activities to work specifically for sitting…" Teacher 2 – p3
>
> "I make them do a lot of climbing to exercise their arms cause I have some very weak children." Teacher 2 – p 7,8

Low muscle tone could be a result of watching too much TV. and not being active enough outdoors:

> "…but we know today we sit in front of the TV, we don't go out as much as we should, so their bodies maybe haven't had as much, maybe they're not playing outside as much as we expected. So we know those are things that happen a lot more than they used to." Teacher 3 – p7
>
> "…a lot of the kids come and they lie and watch TV all day and don't run around outside and play and climb trees and hop and skip and jump." Teacher 2 – p3

4.6.4.3 Sub-theme 4.3: The link between sensory, motor, perceptual and cognitive development and its impact on school readiness

Teachers believe that sensory, motor, perceptual and cognitive development are all linked to the learning of a child and that they cannot be separated as such:

> Talking about the link between sensory, motor, perceptual and cognitive development and the implications for school readiness: "I don't think you can separate them. I think they're all linked. So, I think, in terms of school readiness, it, they all link into each other… so that child is really going to struggle."(if there are developmental deficiencies) Teacher 2 – p6
>
> The relation between **sensory, motor, perceptual and cognitive development and the implications for school readiness: "…**it's kind of the whole child… problems with the motor skills…might influence how the child is going to learn…they're all interlinked. The perceptual and sensory as well I suppose could be linked together and then that all affects

how the child learns. Uhm and then obviously, uhm, it will affect the school readiness. Whether the child is going to be ready or not." Teacher 1 – p5

Practical examples that the teachers mentioned of these links are, for example, low muscle tone, which influences the child's ability to concentrate, and the inability to take part in activities due to sensory deficiencies which affect learning and development negatively:

"…if they don't have good posture, or that kind of thing at the table, if they've got low muscle tone and things like that, it's gonna influence the period of time that they can sit at the table, the concentration on the carpet." Teacher 1 – p4

"They are the ones that are running around and bouncing off the other kids and generally the kids then don't wanna play with them because – that child is rough with me. The sensory seeker, that's the sensory seeker. The sensory avoider, they don't wanna take part in some of the activities because they don't like the senses. To them it is over stimulation. So if we do like finger painting then they don't like that. If it's a touch thing, if it's a noise thing they don't want to take part in the music activities. If it's visual, they don't like collages and stuff cause it's just too busy for them. They also don't like the room being very lit sometimes. And it also affects how we put up artwork. So it (sensory development) has a huge impact on their learning and development in the classroom." Teacher 2 – p 2

It further appears that the resulting tiredness caused by low muscle tone specifically influences learning negatively:

"We do a lot of ta uhm, sort of structured work in the morning, so that's why they've got a lot of, during the week, they can just choose their own go jump on the trampoline or go do this, so. The mornings are quite hectic so if they don't have that then, they are going to get tired and it just won't be constructive learning for them." Teacher 1 – p4

"So, cause if they're feeling tired then they can't focus on what they're doing and then, well it just goes downhill from there. And then they miss concepts. I've got kids who have low muscle tone who miss concepts because they're too tired to sit up straight and listen. And then you end up with a gap and to fill that gap with the curriculum and everything, it's so difficult to do that." Teacher 2 – p4

These aspects lay the foundation of the learners' academic performance for the rest of their lives, and if these do not develop accordingly, it will compromise how they deal with school and work:

"…if our motor skills don't develop according to the lines that we feel they should, then it is going to compromise how we go through school and to work. It can carry on in affecting you there in choosing the job you would like to do, uhm, how you are coping in school." Teacher 3 – p8

"So if they're not reaching the levels that we have set down, that we feel they should be, it will effect what they're able and not able to do in the classroom. And unfortunately, the higher up in school they go, the harder it will then get for them." Teacher 3 – p3

"So, cause if they're feeling tired then they can't focus on what they're doing and then, well it just goes downhill from there. And then they miss concepts. I've got kids who have low muscle tone who miss concepts because they're too tired to sit up straight and listen. And then you end up with a gap and to fill that gap with the curriculum and everything, it's so difficult to do that." Teacher 2 – p4

"It lays the foundation for their academics for the rest of their life." Teacher 2 – p5

"Uhm and then obviously, uhm, it will affect the school readiness. Whether the child is going to be ready or not." Teacher 1 – p5

"I know there is like a massive jump from Grade R to Grade 1 with sitting still. So I need to be able to pick up – are they able to sit?" Teacher 3 – p7

"So we try to develop all that with the aim of next year's Grade 1. They need to be able to sit in the chair for five hours (laugh). **Ag shame, yes.** A bit of a shock to the system." Teacher 2 – p2

4.7 COMPARISON OF SITES: THE SIMILARITIES BETWEEN THE PRE-SCHOOLS

The Grade R teachers of school 1 and 2 were fairly young; the Grade R teacher of school 3 was a teacher with many years of teaching experience. All three schools were in relatively affluent areas, with schools 1 and 3 being in the most affluent areas. I have to mention that all three case study schools had exceptionally friendly and helpful staff and management, which made the research process much easier. All three schools had well-qualified management. All three schools made use of various loose parts, such as sand pit toys and additional apparatus. All three schools had ample climbing equipment. All the teachers felt that their learners spent adequate time outdoors playing and learning. All three schools had storage facilities for loose parts to a greater or lesser extent. The number of learners per class ranged from 16 to 25 learners, with a class teacher and assistant supervising per class.

4.8 COMPARISON OF SITES: THE DIFFERENCES BETWEEN THE PRE-SCHOOLS

School 1 and 2 made use of one playground. School 3 made use of two playgrounds. At school 1 all the age groups played on the same playground, but at different times. At school 2 only the Grade R and RRs played on the playground together. At school 3 all the children from age three played on the same playground at the same time, including the Grade Rs, but the Grade Rs had an additional playground that they used for their own activities and also when the rest of the school was sleeping. Schools 1 and 2 had many trees, but none that were climbable. School 3 only had one smallish tree, but the children could climb it. A very large part of the playground at school 1 was under shade and semi-shade. At school 2 there were many semi-shade areas due to the large trees, but a large area was in full sun. At school 3 there was little shade, except for a small tree and a stoep area. The school building and the jungle gyms, however, provided some additional shade.

4.9 CONCLUSION

In this chapter I discussed how I benefited from using the data analysis strategies that I had chosen in the design process. I looked at the experiences during the data collection process and I presented the empirical data from the three different case studies. The resulting themes and sub-themes that emerged from the data were elaborated upon and validated with direct quotes from the interviews and extracts from

the other data sources. I also compared the three different case studies, discussing the similarities and differences of the three sites.

In Chapter 5, I compare the data documented in this chapter with the existing literature and theoretical framework. I do this in order to answer the research questions and to make a contribution to the emergent theoretical framework. The limitations of the study as well as recommendations resulting from the study are discussed.

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CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Enriched understandings of sensory and motor stimulation in the outdoor learning environment: a South African perspective

5.1 INTRODUCTION

In the previous chapters, I examined the existing literature on the topic, explained the research process that was followed and extracted themes from the data collected. In this chapter I compare the findings in the data with the literature and then address the research questions accordingly. It was very important in this last chapter to argue the main findings of the study in such a way that a conclusion could be made about the research topic (Joubert, 2016:162).

5.2 LITERATURE CONTROL APPLIED TO THE RESULTS OF THE STUDY

The literature control served to illustrate the relation between the findings of this study and established research in four separate tables. It validated my findings with existing research. In Table 5.1 similarities between the existing literature and the results of the study were illustrated. These similarities indicated that the literature correlated with the data of my research. There were also contradictions between my findings and the literature, and these are represented in Table 5.2. Table 5.3 indicates points about which my data is silent, but which are mentioned in the literature. The final table, Table 5.4, presents new insights produced by this study.

5.2.1 SIMILARITIES BETWEEN THE EXISTING LITERATURE AND THE RESULTS OF THE STUDY

Table 5.1 shows the themes and the sub-themes of the study in relation to the similarities found in existing literature and the data of my research. An interpretive discussion explains how the findings of this study reflect established studies of this kind.

Table 5.1: Comparison of results with existing knowledge: supporting evidence

Theme 1 Contradictory perspectives on outdoor learning environments			
Sub-themes	**Author and year**	**Existing knowledge**	**Interpretive discussion**
1.1 Teachers' understanding of an outdoor learning environment	Stoneham (1996:11)	"Teachers highlighted functional benefits that their learners gain from using the outdoors effectively as part of both the formal, informal and hidden curriculum, such as improvements in sensory perception, social skills, co-operative skills and work patterns, enhanced learning opportunities outdoors, a greater variety of patterns of play both in a physically demanding, adventurous sense and in the provision of quieter, restful opportunities, and improvements to special education in general."	The teachers thought that a combination of natural surroundings as well as traditional equipment such as swings, climbing structures etc. were necessary in the outdoor learning environment.
	Maynard, Waters & Clement (2013:221)	"Children's engagement in child-initiated learning and features of the outdoor environment" as contributing to a decrease in underachievement.	
	Pigott (2012:8)	There is a common notion though that the purpose of a playground is simply to get rid of unwanted or unused energy that children have so that they can return to the classroom where the learning will take place.	Teachers 1 and 2 feel that the playground is meant to let off steam for free play and getting rid of energy.
	Frost, Wortham and Reifel (2012:297)	This belief overlooks the complexity of outdoor play and child development. Play environments should be thought of as places that cultivate and inspire, and incorporate different types of play, collaboration among learners, contact between learners and nature and between children and resources.	
1.2 Challenges to the use of the outdoor learning environment	Chakravarthi in Ernst (2013:4)	Teachers' beliefs as to benefits of outdoor settings may limit the opportunities that teachers provide for children in the outdoors.	Teacher 1 says that it is difficult because they are not really in nature.
	Prince, Allin, Sandseter & Ärlemalm-Hagsér (2013:185)	"…a key factor driving time spent outdoors is proximity to nature."	
1.3 Balance between indoor and outdoor learning	Wellhousen (2002:33)	Many teachers working in early childhood settings want to make the outdoor playground an extension of the indoor classroom.	Teacher 3 uses her playground to complement what happens in the classroom.
1.4 Risk versus safety	Sandseter, Little & Wyver (2012:176)	"Norwegian practitioners evaluated risky play as positive for children.	The teachers view risk in terms of safety. Teachers view risks

Theme 1 Contradictory perspectives on outdoor learning environments			
Sub-themes	**Author and year**	**Existing knowledge**	**Interpretive discussion**
		Their main arguments for this were a belief that this kind of play had a positive effect on children's overall development and the idea that they learned to meet challenges and push their own limits. Particularly, the Norwegian practitioners argued that risky and challenging play was important for the development of motor competence and motor control, learning new skills, developing their own courage and self-confidence, and finding out about dangers through their own experiences:"	as challenges, but these challenges must be age appropriate.

Theme 2 Outdoor play is valuable			
Sub-themes	**Author and year**	**Existing knowledge**	**Interpretive discussion**
2.1 Opportunities in the outdoor learning environment	Gehris, Gooze & Whitaker (2014 :11)	"Moving outdoors promotes learning by engaging children's senses and promoting community interaction."	Teachers agreed that learning does take place outdoors.
	Prince, Allin, Sandseter & Ärlemalm-Hagsér (2013:185)	Slovene pre-school teachers and parents see outdoor activities as an important part of the everyday life of pre-school children and emphasise the need for children to spend more time in natural settings, although the potential of these is not optimised.	Teachers want the children to spend more time outdoors, but this is not always achieved.
2.2 Unstructured free play contributes to learning	Pigott (2012:15-16)	Outdoor free (or unstructured) play, in which children determine what activities to engage in, enhances children's physical, cognitive, social and emotional development. It not only affects their motor development in different ways than directed physical education, but it also enhances their well-being by encouraging self-reliance and sociability and stimulating creativity, inquisitiveness, and happiness.	Teachers all agreed that unstructured free play contributed to learning.
	Ernst (2013:4)	Early childhood educators may not associate natural outdoor settings with learning, nor may they see the alignment between developmentally appropriate practice in early childhood experiences and unstructured play experiences in nature.	Some teachers did not focus on learning in unstructured settings.

Theme 2 Outdoor play is valuable			
Sub-themes	**Author and year**	**Existing knowledge**	**Interpretive discussion**
2.3 Enquiry-based learning	Maynard, Waters & Clement (2013:212)	The Foundation Phase for Wales advocates an experiential, play-based approach to learning for children aged three to seven years that includes child-initiated activity within the outdoor environment.	The teachers agreed with the literature, and mostly provide for child-initiated activity during free play.
	Prince, Allin, Sandseter & Ärlemalm-Hagsér (2013:186)	"Outdoor and natural contexts allow children to be more self-directed in their activity and provide opportunities for children to negotiate and resolve arguments without adult arbitration."	Teacher 3 allows the children to sort out their own disagreements or problems in the outdoor learning environment with the help of "the friend of the day" that is a peer that helps the children negotiate situations where they need help.
2.4 Structured and unstructured experiences needed	Gehris, Gooze & Whitaker (2014:8)	"Further research is needed to identify the correct mixture of structured (adult-guided) and unstructured movement experiences and the type of natural features that would best support children's movement and learning."	Teacher 1 believes that unstructured free play contributes to learning. Structured and unstructured experiences are needed.

Theme 3 Creating the ideal learning environment			
Sub-themes	**Author and year**	**Existing knowledge**	**Interpretive discussion**
3.1 Natural versus traditional playgrounds	Mayesky (2006:617)	The word "environment" refers to two things, namely man-made things as well as natural things that children encounter in their surroundings.	Teachers agree that a combination of natural and traditional elements are needed on the outdoor learning environment.
	Gehris, Gooze & Whitaker (2014:8)	Teachers also emphasised the importance of including natural features in the design of outdoor play areas.	Teacher 1 says that the more natural you can go in the outdoor learning environment, the better.
	Gehris, Gooze & Whitaker (2014:8)	"Teachers in our study expressed how natural features – such as areas that attract butterflies, trees for climbing and mounds of sand for digging – engage children's senses and provide opportunities for hands-on learning."	Teachers try to give appropriate sensory stimulation, e.g. teacher 2 encourages her learners to play in the sand.
3.2 Importance of an enriched environment	Maree & Ford (1995:13)	Children who are fortunate enough to have enjoyed a wide variety of interesting and enjoyable early learning experiences and who have participated in a stimulating pre-primary school programme have a distinct advantage over children that	Teachers reported that an enriched environment affords opportunities for children to learn on their own, to provide enriched learning experiences and increase creativity among the learners.

Theme 3 Creating the ideal learning environment			
Sub-themes	**Author and year**	**Existing knowledge**	**Interpretive discussion**
		have grown up in a restricted environment where the extent, range and variety of their experiences has been limited.	
3.3 Transforming playgrounds into learning environments	Çorakçi (2010:2)	There is enormous potential to transform these heavily used outdoor spaces (playgrounds) into exciting learning, playing and socialising environments, to create attractive, child-friendly and sustainable school environments and to encourage increased activity in school settings.	Teachers all agreed that there is definitely potential to transform playgrounds into outdoor learning environments.
3.4 Variety, novelty, and challenge are needed	Sandseter, Little and Wyver (2012:177)	The emphasis on stimulating and challenging play environments for children is also strong among the Norwegian early childhood practitioners.	Teachers held that outdoor learning environments should include variety and novel and challenging encounters for children to gain experience in trying new things and exploring.

Theme 4 Increased deficiency in sensory and motor development among Grade R learners			
Sub-themes	**Author and year**	**Existing knowledge**	**Interpretive discussion**
4.1 The necessity of sensory development	Sebba in Smilkstein (2003:76)	"Developmental theories remind us that children learn experientially through active sensory engagement in their surroundings."	The teachers felt that sensory development had a significant influence on learning and noted that learning difficulties resulted from a lack of sensory development.
4.2 The necessity of motor development	Gehris, Gooze & Whitaker (2014:8)	"Teachers suggested that the self- confidence children develop from acquiring new physical skills carried over to classroom learning and provided children with the confidence to learn academic content."	Teachers feel that motor development is important for aspects such as writing skills and helping children to concentrate longer while sitting still and focusing on what is taught in the classroom.
4.3 The link between sensory, motor, perceptual and cognitive development and impact on school readiness	Perry (2010:iii)	Educators attributed significant importance to physical development in early childhood as a building block for the development of further cognitive skills and academic achievement.	All three teachers believed in the link between sensory, motor, perceptual and cognitive development and that it impacted on school readiness.

Theme 4 Increased deficiency in sensory and motor development among Grade R learners			
Sub-themes	**Author and year**	**Existing knowledge**	**Interpretive discussion**
	Stoneham (1996:11)	Stimulation of the vestibular, proprioceptive and tactile sensory systems promotes development of core posture, bilateral coordination of the body and eyes, praxis (ability to perform planned movement patterns) and achieves optimal arousal states for learning.	Teachers 2 and 3 stated that they used movement in the outdoor learning environment to prepare children for learning.

5.2.2 CONTRADICTIONS BETWEEN THE EXISTING LITERATURE AND THE RESULTS OF THE STUDY

There were contradictions between the literature and the study results. These conflicting ideas are represented in Table 5.2 below. I also discuss why I think these contradictions are present.

Table 5.2 Comparison of results with existing knowledge: contradictory evidence

Theme 1 Contradicting perspectives on outdoor learning environments				
Categories	**Author and year**	**Existing knowledge**	**How does what I found contradict what is known?**	**Interpretive discussion**
1.1 Teachers' understanding of an outdoor learning environment	Moore & Wong (1997:133)	The outdoor learning environment offers "a unique sense of exploration and discovery and a powerful impetus" for learning.	Teacher 2 feels that the playground is to blow off steam; for free play; getting rid of energy.	This might be the case because teacher two associates the outdoor learning environment with free play and feels that the children are too distracted outside for her to facilitate learning outdoors often.
	Greenman, 2003:75	It is commonly thought that the purpose of a playground is simply to get rid of children's unwanted or unused energy before they return to the classroom where the learning will take place.	Teacher 3 feels that the more she can be outdoors teaching, the better.	This could be because she uses the outdoor learning environment to complement the teaching that takes place in the classroom.
	Chakravarthi in Ernst (2013:4) Davies in Ernst (2013:4)	An early childhood educator tendency to associate outdoor settings with physical and social development, as opposed to a wider range of developmental benefits, and to view the role of natural elements in outdoor settings as having aesthetic rather than educational value.	The teachers agreed that children learn from being outdoors in nature	Teachers 1 and 2 facilitated learning on the outdoor playground to a limited extent. Teacher 3 had a good balance between indoor and outdoor learning.

Theme 1 Contradicting perspectives on outdoor learning environments				
Categories	**Author and year**	**Existing knowledge**	**How does what I found contradict what is known?**	**Interpretive discussion**
1.2 Challenges to using the outdoor learning environment	Stoneham (1996:11)	Teachers highlighted functional benefits that their pupils gain from using the outdoors effectively, such as improvements in sensory perception and enhanced learning opportunities outdoors.	Teacher 2 mentioned that some of her learners became hyperactive and very excitable if she used the outdoors too often because they were overstimulated.	Lack of sensory development seemed to be the reason why teacher 2 avoided using the outdoor learning environment instead of using it for sensory stimulation, because sensory deficiencies made it difficult for children to learn outdoors.
1.3 Balance between indoor and outdoor learning	Nursery School Association of South Africa (1972:18)	There should be no strict division between indoor and outdoor space, and it should be possible to use both spaces simultaneously.	Observation revealed that the position of the Grade R classroom on the second storey and the other age groups occupying the playground during Grade R class time.at school 1 made it difficult to use the classroom and playground simultaneously.	It seems that even though the teachers feel that there should be a balance between indoor and outdoor learning, outdoor learning is mostly used for free play and also not for long periods in the mornings, but rather in the afternoons.
	Verster (1992:182)	This is in harmony with the way that Montessori arranged her classrooms. She was the forerunner of the 'open classroom' movement.		
	Eaton in Dillon, Rickinson, Teamey, Morris, Choi, Sanders, Benefield (2006:107)	Outdoor learning experiences were more effective for developing cognitive skills than classroom-based learning	Teachers used the classrooms more for academic learning. Teacher 3 used the outdoor playground to complement what was taught inside, but all three teachers were based inside the classroom for most of their academic learning.	Teachers in South Africa are used to classroom-based learning. The teachers in this study felt that both indoor and outdoor learning were necessary, but their practice revealed the focus to be more on indoor learning.
1.4 Risk versus safety	Prince, Allin, Sandseter & Ärlemalm-Hagsér (2013:185)	Risk aversion can lead to the overprotection of children and can potentially limit their potential for learning through challenging and risky play activities.	Teacher 2 mentioned that they didn't want children to fall and break their arms. Teacher 3 mentioned that she would not let her children do something when there was a good chance that they were going to have an accident.	Teachers do not facilitate risk-taking much, as they admit that while it may be good for the child's development, they want to protect children from injuries.

Theme 2 Outdoor play is valuable				
Categories	**Author and year**	**Existing knowledge**	**How does what you found contradict what is known?**	**Interpretive discussion**
2.1 Opportunities in the outdoor learning environment	Eaton in Dillon, Rickinson, Teamey, Morris, Choi, Sanders & Benefield (2006:107)	Outdoor learning experiences are more effective for developing cognitive skills than classroom-based learning.	Observation of the daily programme of the school showed that the focus was on classroom- based learning and much more time was spent inside the classroom than outdoors.	Teachers do not facilitate as much outdoor learning as what they actually agree is beneficial for the learners.
	Ryder Richardson (2006:8)	The multi-dimensional and multi-sensory surrounding of the outdoors are inviting to young learners	Teacher 2 said that it was difficult to facilitate learning outdoors because her learners were not able to pay sufficient attention	Lack of sensory development is a challenge for not using the outdoors.
	Maynard, Waters, & Clement (2013:221)	They are allowed to be "louder, wilder, and more expressive" outside"	Teacher 3 reported that the principal of the school did not allow wild games such as mock fighting on the playground.	This is due to safety reasons. The teacher allows fighting games in her classroom because she feels that it is then a controlled environment.
		The Foundation Phase teachers described the apparent failure of the learners to achieve in the classroom lessened in the outdoor learning environment.	Teacher 2 feels that she cannot bring her children outside too often as they become too distracted for learning to take place	These are due to sensory issues, but also due to the environment being novel and creating too much excitement for them to pay attention to the teacher. I also think that the teacher tries to teach outdoors instead of facilitating learning.
2.2 Unstructured free play contributes to learning	Pigott (2012:15-16)	Outdoor free (unstructured) play, in which children determine what activities to engage in, enhances children's physical, cognitive, social, and emotional development. It not only affects their motor development in different ways than directed physical education, but it also enhances their well-being by encouraging self-reliance and sociability and stimulating creativity, inquisitiveness, and happiness.	The teachers do not really focus on or acknowledge the learning that takes place during free play time. They feel that this is a time where children can just "play".	Teacher 1 said that children needed a break from the structured activities because they got tired. She also said that they "got their energy out" on the playground.

Theme 2 Outdoor play is valuable				
Categories	**Author and year**	**Existing knowledge**	**How does what you found contradict what is known?**	**Interpretive discussion**
2.3 Enquiry-based learning	Falk in Ghafouri (2014: 68) Csikszentmihalyi in Ghafouri (2014: 68)	"When 'the learner exercises a large degree of choice and control over the what, when, and why of learning' and when the learner experiences flow 'act(ing) with total involvement' the emergent learning experiences will be beyond what a planned and scripted lesson can offer."	Teachers only used enquiry- based learning to a limited extent and to varying degrees, with teacher 3 using it the most and teacher 1 not being in favour of enquiry-based learning in the outdoor learning environment	Teachers might not use enquiry-based learning as often as they would like to as they might feel that they would not achieve the outcomes for the lesson or they do not feel knowledgeable enough to use this approach to learning.
2.4 Structured and unstructured experiences are needed	Frost, Wortham & Reifel (2012:165)	Objects that are unstructured, varied in play features, and unpretentious in design are best suited for young children	From the interviews and observations it seemed that the teachers provided mostly structured experiences indoors and unstructured experiences outdoors.	Although the teachers agree that structured and unstructured experiences are needed, few structured experiences are provided in the outdoor learning environment compared with the learning that takes place inside the classroom.
	Pigott (2012:15)	Young learners will engage with nature and the outdoor learning environment with amazement and interest if they are afforded the opportunity and directed wisely	The teachers do not interfere in free play time. They do not facilitate learning during these times except for some sensory tables where they give very limited guidance.	This could be the case because teachers feel that outdoor play should be unstructured and without adult interference.

Theme 3 Creating the ideal outdoor learning environment				
Categories	**Author and year**	**Existing knowledge**	**How does what you found contradict what is known?**	**Interpretive discussion**
3.1 Natural versus traditional playgrounds	Fjørtoft in Prince et al., 2013:184; Fikus & Luchs, 2013:208.	"Pre-school children develop better motor abilities when playing in nature compared with traditional playgrounds"	From the observations it was evident that the playgrounds were all structured in a more traditional manner.	Even if there were some elements of nature and natural elements such as trees or vegetable gardens in the outdoor learning environment, the children's engagement with these elements was very limited and controlled.

Theme 3 Creating the ideal outdoor learning environment				
Categories	**Author and year**	**Existing knowledge**	**How does what you found contradict what is known?**	**Interpretive discussion**
3.2 Importance of an enriched environment	Stoneham (1996:11)	Teachers highlighted that pupils using the outdoors effectively experienced improvements in sensory perception, social skills, co-operative skills and work patterns, enhanced learning opportunities outdoors, and improvements to special education in general.	Teacher 2 noted that some of her children got too distracted outdoors to learn and that she needed to limit sensory overload for these children.	The outdoors affords an enriched sensory and motor stimulating environment, but due to learning difficulties prevailing among children these days, it becomes increasingly difficult to use the outdoors for structured learning, and teachers prefer to use the indoor classroom where there is less stimulation.
3.3 Transforming playgrounds into learning environments	Beans & Brown (2014:128)	"Outdoor encounters should be premeditated with the purpose of giving young learners prospects to gain more understanding about themselves and their connection with the environment."	Teachers 1 and 2 did not know why the playground was designed in the manner that it was and they were not involved in the process.	Teachers 1 and 2 felt that free play was not to be interfered with by the teachers. Loose parts are provided, but not with specific outcomes planned for the use of these materials.
3.4 Variety, novelty, and challenge needed	Wellhousen (2002:33)	Novel experiences introduced too quickly or profusely can overstimulate and have a negative effect.	Teacher 3 felt that the learners should be experiencing new things all the time.	Teacher 3 might have said this because in her experience, Grade R learners get bored easily – this might be different if the learners were in a more natural setting.

Theme 4 Increased deficiency in sensory and motor development among Grade R learners				
Categories	Author and year	**Existing knowledge**	**How does what you found contradict what is known?**	**Interpretive discussion**
4.1 The necessity of sensory development	Faber and Van Staden (2005:43) Ayres in Refshauge et al., (2013:16)	The following senses are added to the commonly known five senses: • Chromatic • Thematic • Baric • Stereognostic • Kinaesthetic and the vestibular sense	Teacher 2 only mentioned the commonly known five senses. Teacher 2 vaguely referred to the vestibular sense and teacher 3 referred to the kinaesthetic sense.	If teachers are not knowledgeable about the additional senses above the traditional five commonly known, they might not facilitate stimulation of these senses.
4.2 The necessity of motor development	Gallahue; Frost, Wortham, and Reifel; Hughes in	Elementary motor abilities gained during the formative years include	The teachers only mentioned fine motor, gross motor,	The teachers did not make any mention of perceptual motor

	Pigott, 2012:7	"fine motor, gross motor and perceptual motor" abilities	and core muscle development in the interviews.	abilities. This could be because they viewed perceptual motor abilities in the broad category of perceptual development.
	Pigott (2012:14)	Both fine and gross motor abilities are stimulated when "playing in nature".	Teacher 2 does fine motor, gross motor and core exercises with her children in class.	This could be because teacher 2 wanted to do the exercises in a controlled environment.

5.2.3 COMPARISON OF RESULTS WITH EXISTING KNOWLEDGE: SILENCES IN DATA

When comparing the results of the study with the literature, certain silences were found in the data. These silences are linked to trends which are related to the themes of the study. The silences are listed in Table 5.3 with a discussion on why I assumed these silences to be present.

Table 5.3: Comparison of results with existing knowledge: silences in data

Trend	Author and year	Interpretive discussion
Including animals in the outdoor learning environment	Williams-Siegfredsen (2012:49)	Teachers did not mention that animals should form part of the outdoor learning environment. This could be due to space restraints, the cost of feeding these animals and possible health and license regulations for maintaining these animals.
Outdoor learning experiences are more effective for developing cognitive skills than classroom-based learning.	Eaton in Dillon et al. (2006:107)	Teachers did not specifically mention that outdoor learning experiences were more effective for learning than classroom-based learning; however, they did emphasise that a combination of the two was necessary.
Children in the natural play environment play much longer, showing an increased interest and concentration level because they are more engaged in their play. This in contrast does not exist in the traditional play environment.	Fikus and Luchs (2013:206)	Teachers made no mention of natural play environments increasing concentration and interest levels among the young learners during play episodes.

5.2.4 COMPARISON OF RESULTS WITH EXISTING KNOWLEDGE: NEW INSIGHTS

There were aspects that emerged as novel in this study. These aspects are listed and described in Table 5.4 below. The results are presented in categories which are related to the themes of this study. These new insights are also discussed in section 5.6 (see p. 140) as the possible contribution of this study.

Table 5.4: Comparison of results with existing knowledge: new insights

Categories	Description	Interpretive discussion
A South African perspective of sensory and motor stimulation on the outdoor playground for Grade R learners	No previous research in Pretoria was found regarding both the sensory and motor stimulation of the Grade R learner in the outdoor learning environment.	Although international research has been done on the value of outdoor learning environments, the novelty of this study is that the research was done from a South African educator's perspective.
Cost-effective enrichment of the outdoor learning environment	Teachers gave examples of how to enrich an outdoor learning environment for sensory and motor stimulation at very little cost.	Teachers in South Africa are very aware of the need to enrich playgrounds, but are equally aware of the general lack of funds that most South African schools are faced with. Even in these affluent schools, they try to use cost-effective ways to enrich the playground when funds are not available. These principles can help impoverished schools to enrich their outdoor learning environments, even though this study was done in more affluent nursery schools.
Rubric for the design and use of an outdoor learning environment for whole-child development	A rubric that was compiled from the literature, theoretical framework and themes that emerged from the data of this study.	This rubric provides a tool that educators can use to evaluate the design and use of an outdoor learning environment for sensory and motor development. This rubric can be found in Addendum 3.

5.3 ADDRESSING THE RESEARCH QUESTIONS FROM FINDINGS OF THE STUDY

The purpose of this study was to use the existing literature and the data collected in the study to create and integrate principles for the design and use of an outdoor learning environment. Design criteria were established based on the theoretical framework of this study and were corroborated by research papers in the literature review. The data, including the interviews, observation tools such as the site map, site inventory, the rubric on features of outdoor playground settings for sensory and motor stimulation and the field notes, helped me to develop a better understanding of the research topic from the educator's point of view. This data also made a contribution to the rubric for the design and use of an outdoor learning environment for whole-child development that I drew up from the theoretical framework and relevant literature. All the data was investigated in order to answer the research questions.

I followed the process of answering the research question as suggested by Joubert, (2016:158) by firstly addressing the secondary research questions, as these are instrumental in answering the primary research question. Each answer was founded in validated results from the data obtained from existing research so as to find potential novel understandings or to substantiate existing knowledge (Creswell, 2010:113). I then answered the primary research question and reviewed the emerging theoretical framework from the contribution the study made in this regard. Therefore the findings of the study had to relate to the aim of the study as well as the research questions.

5.3.1 SECONDARY RESEARCH QUESTION 1

What is sensory and motor development and how does it take place?

The answer to this question emerged from sub-theme 2.4 (see p. 101), sub-theme 4.1 (see p. 109) and sub-theme 4.2 (see p. 112), where teachers agreed that sensory development is definitely very important and must take place in the young child. Schmidt (2003) stated that this sensory development takes place when the senses are growing. The teachers affirmed this in the study by explaining that if opportunities are provided for children to experience information about the world around them through their senses, then sensory development will result. The teachers emphasised that these sensory experiences must be such that the senses are not over- or understimulated, which has an adverse effect on the sensory development that needs to take place. The rubric for features of outdoor playground settings for sensory and motor stimulation revealed that children experienced sensory and motor stimulation across most of the playground (Addendum 2), but it is the richness of this experience that is determined by the affordances provided.

The literature revealed that there are more senses than the five senses of touch, smell, sight, hearing and taste that are commonly known (Munsinger in De Witt & Booysen, 1995:71) and therefore also more areas of sensory development. These are the chromatic, thermic, baric, stereognostic, kinaesthetic, and the vestibular senses (Faber & Van Staden, 2005:43). Teachers varied in their knowledge of the additional senses. A better knowledge of the additional senses could help them better facilitate development in those sensory areas.

The teachers were in agreement that motor development is equally important for the young child. They explained that this development takes place when children's bodies are developing and maturing, enabling them to acquire more skills in every area – balance, ball skills, hand-eye co-ordination, midline crossing etc. The teachers mentioned that this development included gross and fine motor skills as well as core muscle strength.

Sensory and motor development therefore takes place when children are experiencing stimulation of the senses and motor responses. Teachers are of the opinion that sensory and motor development can take place during structured or unstructured experiences provided for the child and that both are important components of this development. Unstructured experiences usually occur during free play, while structured movement experiences will include an activity such as a set obstacle course or a specific movement programme on the playground. Unstructured experiences give the child an opportunity to learn new things on their own and also from their peers.

5.3.2 SECONDARY RESEARCH QUESTION 2

What are the sensory and motor development milestones of the Grade R learner?

The answer to this question emerged from sub-theme 4.1(see p. 109) and sub-theme 4.2 (see p. 112). Teachers were hesitant to elaborate on sensory developmental milestones, partly because some were not sure what was meant by the term, with only one of the three teachers expressing that she had specific developmental milestones she expected her Grade R learners to reach. The other two teachers did not elaborate on the milestones, but claimed that they would be able to see the lack of sensory development when they exposed the learners to sensory activities, where it would be apparent if a child was over- or undersensitive and consequently a sensory seeker or a sensory avoider.

In a previous study I conducted about sensory development (Smit, 2012), most of the teachers who were interviewed were of the opinion that if a rich array of sensory experiences were available to the young child, the child would engage in this sensory stimulation naturally. If the child does not engage naturally, the teacher can see that there is a deeper problem that needs intervention strategies. It seems that the teachers in this study echoed the same opinion about the assessment of sensory development.

The teachers were more confident when explaining what motor development milestones the Grade R learners needed to achieve. One teacher explained that the teachers at their school had averages of motor development milestones they knew they were expected to see, e.g. can the learner sit on a chair, can they sit on the carpet with their legs crossed and hands on their knees etc. This teacher specifically monitored muscle tone as well. The other teachers mentioned that they made use of assessments that cover gross and fine motor skills and typically include aspects such as hopping on one leg, skipping, jumping jacks, rolling, skipping with ropes, co-ordination and crawling. Van Staden and Faber (2004:3) note that the necessary physical progress for a young learner during their Grade R year is to cultivate a resilient and fit physique, achieve motor and perceptual abilities according to their age and grasp and regulate their body and be physically self-sufficient.

5.3.3 SECONDARY RESEARCH QUESTION 3

What constitutes the outdoor learning environment of the Grade R child?

The answer to this question emerged from the observation and across sub-theme 1.1 (see p. 88), sub-themes 2.1 (see p. 93), 2.2 (see p. 97), 2.3 (see p. 99) and 2,4 (see p. 101) and sub-themes 3.1 (see p. 103), 3.2 (see p. 104), 3.3 (see p. 105) and 3.4 (see p. 108). Nature seems to be a primary constituent of a sensory and motor stimulating outdoor environment, according to the data and the existing literature. The data revealed that teachers felt that children learned through nature and being outdoors and that nature should be incorporated into the outdoor learning environment anywhere possible.The literature indicates that “deeper engagement in exploring and discovering the natural environment around them” (Ghafouri,

2014:69) affords greater sensory and motor stimulation, strengthens perceptual development and ultimately enhances cognitive development.

The literature revealed that there should be a move away from the conventional playgrounds, because these type of play areas provided the minimum play affordances and the greatest ambling and stationary behaviour among the children, with the result that they did not engage in play (Prince et al., 2013:184). This discourages exploration and self-directed activity, resulting in a decrease of sensory and motor development. Teachers noted that if topography does not provide the affordances needed for sensory and motor stimulation, then it could be beneficial to have structures that promote these, therefore a natural outdoor learning environment could also incorporate man-made structures to enhance opportunities for stimulation.

Another aspect in the data as well as the literature is the need for novelty, variety and challenge in the outdoor learning environment for sensory and motor stimulation. Teachers feel that Grade R learners in particular need many new experiences outdoors. Teachers feel that there must be opportunities for the children to explore and discover on their own in the outdoor learning environment. Loose materials and apparatus are varied on a weekly basis to enhance opportunities for new experiences in addition to the other elements comprising the outdoor learning environment. The teachers' views echo Pigott (2012:102-104), who stated that a diverse selection of natural and man-made loose parts will add educational value to the outdoor learning environment.

From the site map, site inventory and field notes it seemed that open spaces contributed to children's desire to engage in running and vigorous activity, as the size of the open space of the playground was proportionate to the vigour applied in running that took place in each setting. Feez (2011:48) noted that children must be able to run freely and spontaneously. Outdoor learning environments should therefore not be too crowded by either equipment or too many children at any time to promote motor development.

5.3.4 SECONDARY RESEARCH QUESTION 4

How do educators employ the outdoor learning environment for sensory and motor development of the Grade R learner?

The answer to this question was found across sub-themes 1.1 (see p. 88), 1.2 (see p. 88), 1.3 (see p. 90), 1.4 (see p. 91) and sub-theme 2.1 (see p. 93) and 2.2 (see p. 97). The observation notes were also helpful as a source of data in answering this question. Firstly, the teachers in the study understood their playgrounds (see Fig. 3.3 p. 60, Fig. 3.6 p. 64, Fig. 3.9 p. 67 and Table 3.1 p. 61, Table 3.2 p. 64 and Table 3.3 p. 68) to be an outdoor learning environment, with one teacher adding that an outdoor learning environment is a planned and structured environment in contrast to free and unstructured play. Therefore her understanding is that their playground would be an outdoor learning environment when she plans a

specific lesson that takes place outside. According to Pigott (2012:111), an increased understanding of what outdoor learning environments are will enable teachers and designers to use the spaces more successfully.

Teacher 3 used the outdoor learning environment for additional specific purposes when children with difficulties need to use the outdoor learning environment to prepare them for learning in the classroom and also to help them cope with learning during class time by taking a break and spending a few minutes in the outdoor learning environment. Chakravarthi in Ernst, (2013:4) notes that the views educators hold of the outdoor learning environment may reduce the prospects the educator provides for children outdoors. What was conspicuous in this research was that the knowledge and experience that the teacher had also played a great role in the richness of experiences provided for the children outdoors.

The teachers in the study were in agreement that children need challenges for their development and that they must be encouraged to take risks in the outdoor learning environment, but that the teacher needs to be knowledgeable about what risks and challenges are age appropriate. These challenges that the teachers want to provide for the children are set off against safety measures. Sandseter, Little and Wyver (2012:176) reported that Norwegian educators contended that risky and challenging play was central for the progress of motor ability and motor skills, attaining new proficiencies, growing courage and self-confidence and learning about hazards through personal encounters: From the observation it seemed that the wooden climbing structures provided challenging play to some extent when there were no trees or uneven, rocky surfaces. Teachers therefore employed these wooden structures when natural features of varied topography were not available to children on the playground.

Teachers used the outdoor learning environment for the growth and development of all the motor skills of the child. They provided different items, such as balls, hoops, sandpit toys etc., for skill development each day. All the teachers made use of sensory tables in the interviews, although I only observed the use of these tables at two of the schools.

Opportunities for outdoor play can also be planned by the teacher and can depend on the theme of the week. Teachers used the outdoor learning environment in many aspects to complement the learning that takes place inside the classroom. The aspect of infusing learning into outdoor play was also found in the literature. Many teachers working in early childhood settings want to make the outdoor playground an extension of the indoor classroom (Wellhousen, 2002:23).

Teachers are aware of the difference between structured and unstructured play and employ both in the outdoor learning environment. Teachers made use of structured as well as unstructured activities for sensory and motor development outdoors. Teachers also understand that sensory and motor development result from free play. In other words, learning results from free play. Teachers feel that sensory stimulation

during unstructured free play contributes to learning and also specifically to self-directed learning. This is also the case for motor stimulation. The children gain experience through exploring and trying new things on their own. In a study by Gehris, Gooze and Whitaker (2014:8), the educators maintained that "natural features – such as areas that attract butterflies, trees for climbing and mounds of sand for digging" – involve the senses of the learners and afford occasions for "hands-on learning". Teachers do not interfere during free play, because this type of play affords its own kind of development. This fact was validated by my observations, as I noted that teachers were not directing any activities the children were involved in.

Teachers mentioned certain challenges to the use of the outdoors as a learning environment such as weather, overstimulation in the outdoor environment and lack of time. They also offered solutions to most of these challenges, with careful planning and being versatile being the most important.

5.3.5 SECONDARY RESEARCH QUESTION 5

How does sensory and motor stimulation impact on the Grade R learner's development and ability to learn?

The answer to this question emerged from sub-themes 4.1 (see p. 109), 4.2 (see p. 112) and 4.3 (see p. 114). The teachers in this study agreed that sensory and motor development has a significant influence on the child's ability to learn. They mentioned many learning difficulties resulting from a lack of sensory and motor development, which they experienced as having become more prevalent during the last few years.

Teachers noted that sensory development had a vast impact on children's learning and development. If sensory development has not taken place appropriately, the child will fall behind and even be lost in the classroom. Sensory avoiders and sensory seekers therefore experienced difficulties in the classroom situation. If all the areas of sensory development are not in place, the child's learning is going to be severely compromised, as these deficiencies will result in learning difficulties. Refshauge, Stigsdotter, Lamm and Thorleifsdottir (2013:1) support the view that a lack of sensory development may result in learning difficulties.

Teachers stated that motor development also has to take place, because that is how our human bodies work. If our motor skills do not develop like they should, it is going to compromise how we go through school and to work. If muscles are not developed, then tiredness will result and then learners can't focus, they can't listen to what the teacher is saying and in the end they will close down and no learning will take place. Teachers noted that motor development is important for aspects such as writing skills and to help children to concentrate longer while sitting still and focusing on what is being taught. Teachers also noted that problems resulting from a lack of motor development include aspects such as lack of concentration and compromised learning because children are too tired to focus. Ayers in Refshauge et al. (2013:1) says

that it is imperative that children therefore engage in physically challenging experiences in their environment as soon as possible.

Teachers believe that sensory, motor, perceptual and cognitive development all form part of the learning of the child and that they cannot be separated. Practical examples mentioned of these links were aspects such as low muscle tone, which influences the child's ability to concentrate. Another example was the inability to take part in activities due to sensory deficiencies, which impacts negatively on learning and other development. These aspects lay the foundation of the learners' academic performance for the rest of their lives, and if these do not develop accordingly, learning difficulties will result. This confirms Elliot's view (in Ernst, 2013:5) that developmental philosophies propose that young children learn through active physical and sensory interaction with their environment.

5.3.6 PRIMARY RESEARCH QUESTION

How can the outdoor learning environment be designed and used to enhance sensory and motor stimulation of the Grade R learner?

The secondary research questions form the basis for answering the primary research question. The answer to this question therefore flows from the answers to the secondary research questions, from sub-themes 3.1 (see p. 103), 3.2 (see p. 104), 3.3 (see p. 105) and 3.4 (see p. 108) and the observations that were done at each site which included the site maps (see Fig 3.3 p. 60, Fig. 3.6 p. 64 and Fig. 3.9 p. 67), site inventories (see Table 3.1 p. 61, Table 3.2 p. 64 and Table 3.3 p. 68), rubrics on features of the outdoor learning environment for sensory and motor stimulation (see Table 4.1 p. 80, Table 4.2 p. 81 and Table 4.3 p. 82) and field notes (Addendum 6).

Teachers felt that it was important for children to be in nature as much as possible, because they learn through nature and being outdoors. Ernst (2013:5) stated that "nature experiences have been associated with superior cognitive functioning". The teachers in this study, on the other hand, felt that in their experience the ideal outdoor learning environment for sensory and motor stimulation should contain a combination of natural and traditional elements.

Teachers in the study noted that the outdoor learning environment should be enriched because this gives children more opportunities to learn on their own through play and enriched learning experiences. Grade R children in particular need many new experiences; they should experience new things all the time. Therefore change, variety and challenges are needed in the outdoor learning environment for the learners to gain experience by trying new things and exploring. Everything that is incorporated into the outdoor learning environment must be such that it can be built on. Teachers can therefore add and build on what they already have available on the playground. Teachers feel that in the teacher's perspective, the environment must be a learning environment, but the child should experience the environment as fun and

inviting. The outdoor learning environment must also complement classroom teaching and match the theme that the teachers are covering.

The teachers pointed out that much planning and out-of-the-box thinking was needed when designing an outdoor learning environment. They pointed out that educators needed to work with what was available to them in terms of resources. Good planning could reduce the cost of transforming the playground into an outdoor learning environment. Neither a lack of funds nor the lack of a garden or equipment should be viewed as a factor limiting the transformation of the outdoor learning environment for sensory and motor stimulation. The potential for transformation does, however, depend on the teacher, and the teachers demonstrated various levels of effective use of the outdoor learning environments for sensory and motor stimulation.

Teachers mentioned all the elements they considered necessary in the playground to transform it into a learning environment. These elements should include many opportunities for free play, as free play results in development and learning in sensory and motor areas (as discussed in sub-question five, sub-theme 2.2 p. 97). An aspect not mentioned by the teachers and absent from the case studies investigated, with the exception of wild birds, was the inclusion of animals in the outdoor learning environment. In the literature, Williams-Siegfredson (2012:49) suggested that animals should be included in the outdoor learning environment – ranging from large to small animals, depending on the available space.

From the literature and observations it is evident that it is not sufficient for there to be a rich array of opportunities in children's surroundings; the children must have access to engage in these prospects (Spencer & Blades, 2006:142). Therefore an outdoor learning environment cannot simply include a vegetable garden, for example, but should include a vegetable garden where the children are involved in planting, tending and harvesting the vegetables. Children must be allowed to enter the green areas of the playground, to climb the trees, to pick the flowers and in short to learn from these natural elements by their own experiences. It is important, according to Feez (2011:48) and Ghafouri (2014:58) that children have the opportunities to be involved in self-initiated enquiries, activities or play. It is also important to take note that an outdoor learning environment should include a teacher to assist and guide the child to evaluate risk for themselves (Roopnarine & Johnson, 2013:337; Hall, Horgan, Ridgway, Murphy, Cunneen, & Cunnigham, 2010:45) and to facilitate the learning process on different levels (Slabbert et al., 2009:118). In the rubric for the design and use of an outdoor learning environment for whole-child development (see Addendum 3), all the recommendations and guidelines found in the literature and data are included to form a tool for whereby outdoor learning environments can be designed and used.

5.4 EMERGENT THEORETICAL FRAMEWORK

5.4.1 COMPONENTS THAT ADDED VALUE TO THE STUDY

The components and information of the theoretical framework that had value for my study was firstly Table 2.2, which consists of a list of principles that are mostly concrete and measureable when looking at the design and use of an outdoor learning environment. The table consists of design aspects as well as aspects of the use of the outdoor learning environment. A teacher can add these elements systematically to the outdoor learning environment or can use the table as a guideline to see if the outdoor learning environment has these principles in place.

Secondly, Figure 2.2 (see p. 52) contributed to my understanding of the principles in Table 2.2 (see p. 50) and the emergent themes in the data. However, this figure is not as straightforward and measurable as Table 2.2 and deals with the principle behind the facilitation of learning on the outdoor playground. There must be a level of involvement from the child and the facilitator of learning (teacher). This formed part of how the outdoor learning environment should be used for authentic learning to take place. From this model I understand that a child cannot only engage in free play all the time, but that the teacher needs to plan the learning in such a way that the child is actively engaged in the learning process, that he is searching for meaning in what he is doing and that learning is maintained so as to reach a higher level of authentic learning. The teacher has a fundamental role in this process, as she must observe whether the child is engaged in authentic learning. Thus the model of Slabbert et al. (2009:102) in Figure 2.2 and Table 2.2 suggests that the learning environment should include a teacher.

5.4.2 RELATIONSHIP BETWEEN THE THEORETICAL FRAMEWORK AND THE DATA

A definite link between the data and the theoretical framework was evident in this study. Firstly, this study confirms the theories in the table of principles, such as beautiful gardens, water play and water that can be transported, digging pits with sand and earth, vegetable gardens, distinguishing different plants and scents, opportunities for children to learn how to assess risk and accept challenges, child-size equipment and tools such as buckets and spades and bicycles. The physical activities in the table are much the same as what emerged from the data, and in sub-theme 4.2 (see p. 112) it was evident that teachers thought motor stimulation to be important. Many of the principles in the table promote sensory stimulation, an aspect that teachers found very important (sub-theme 4.1 p. 109).

Secondly, what stood out for me – due to the constructivist lens of Slabberts' model of facilitation of authentic learning – was that children learn through what they actively engage in in their surroundings and links with enquiry-based learning in sub-theme 2.3 (see p. 99). This aspect came to the fore in the literature and in the study data, as teachers also felt that an enriched environment was important (sub-theme 3.2

p. 104) and that playgrounds could be transformed into outdoor learning environments (sub-theme 3.3 p. 105).

5.4.3 INSIGHTS GAINED FROM THE THEORETICAL FRAMEWORK

The theoretical framework helped me to come to new insights and to understand the data better in that firstly, a preliminary contribution was made to the theoretical framework by formulating concepts expressed in the works of Montessori (Montessori, 1988), Malaguzzi (Cadwell, 2003) the Scandinavian Forest School Movement (Knight, 2009) into a table of eight principles for the design and use of an outdoor learning environment. This table (see Table 2.2 p. 50) and the model of Slabbert for facilitation learning formed the basis for the rubric formulated for the design and use of an outdoor learning environment for whole-child development as found in Addendum 3. This is also discussed in Table 5.4 (see p. 129), which lists new insights found in the data.

The eight universal principles of the design and use of the outdoor playground were not fully reflected in the schools studied; for instance, animals were not included in the outdoor learning environment.

Secondly, the constructivist lens of facilitation of the model of and for facilitation of learning as found in Slabbert et al. (2009:102) was used to view the literature and findings of the study.

An added contribution of this study might be the data gathering tools employed in the study. This study resulted in: 1. a map containing schematic detail of each site (see Figure 3.3 p. 60); 2. an inventory documenting site details and the relevance for sensory and motor stimulation (see Table 3.1 p. 61); 3. a rubric for recording the site features of an outdoor learning environment for sensory and motor stimulation (see Addendum 2); 4. a rubric for the design and use of an outdoor learning environment for whole-child development (see Addendum 3).

In conclusion, this study adds to the theory and practice of the design and use of an outdoor learning environment for the five- to six-year-old learners of my case study. The recommendations are given as guidelines in a rubric for the design and use of an outdoor learning environment for whole-child development (see Addendum 3). This rubric is the contribution to the theoretical framework and builds on Table 2.2 (see p. 50) and Figure 2.2 (see p. 52) of the theoretical framework. Therefore I propose that a valuable outdoor learning environment for perceptual development be designed as well as facilitated for the appropriate sensory and motor stimulation to take place.

5.5 LIMITATIONS OF THE STUDY

Taking into consideration that qualitative research has both strengths and weaknesses (Creswell et al., 2010:60; Burton & Bartlett, 2009:64; Bogdan & Biklen, 2003:60), some challenges that limit the study were

noted. I dealt with these limitations by addressing the challenges as best as possible within the scope of this study.

Firstly, I acknowledge that aspects additional to the design of the outdoor learning environment might impact on the manner in which learners behave in these settings during playtime (Pigott, 2012:97). The study did not focus on gender, and I acknowledge that aspects such as gender, culture and race play a big role in the type of play and movement that children engage in, and that this must be accommodated in the design. Further empirical work is needed to determine the influence of gender, culture and race and to determine the extent to which these will influence the design and use of the outdoor learning environment for sensory and motor development and to provide further evidence.

Secondly, case study research is sometimes restricted by time and activity (Creswell et al., 2010:294; Joubert, 2016:136-138). In this study only three schools located in Pretoria were included in the study, and they were observed during set outdoor free-play breaks. The study only focussed on observing the activity in the outdoor learning environment during free play. Therefore the study observed only what facilitation of learning took place between the teachers and the learners outdoors, when the teachers did not want to interfere. It appeared in the interviews conducted with the Grade R teachers that they did facilitate learning during their class time outdoors on occasion. Validity was checked by returning to the participants and asking them whether the conclusions drawn from their inputs matched their own views.

Thirdly, I formulated an in-depth explanation of the use of the playgrounds for sensory stimulation and development of the participating pre-primary schools. This improves transferability to other cases. Explaining how the research was conducted, its confidentiality and its purpose also helped. In order to be willing to co-operate fully, participants needed to feel safe while the research was being conducted. "One of the greatest strengths of qualitative research is the richness and depth of explorations and descriptions it yields" (Creswell et al., 2010:60) and "the in-depth analysis and understanding gained" (Burton & Bartlett, 2009:64).

Lastly, perceptual development is a vast area of research and was not covered fully in this limited study. Further empirical work at other sites and in other contexts is needed to determine the extent of the benefits of outdoor play for perceptual development and to provide further evidence.

Notwithstanding the restrictions mentioned above, this research could prompt attempts to encourage the provision and use of natural outdoor learning environments for young learners and also direct future studies involving "natural outdoor settings in early childhood education" (Ernst, 2013:14,15.)

5.5.1 TRANSFERABILITY

The study cannot be generalised, but transferability to cases similar to those in the research study may be possible. A metaphor often used in the social sciences is that a well-selected case constitutes the dewdrop in which the world is reflected (Creswell et al., 2010:76). I made use of case studies because this research did not necessarily have to be applicable to South Africa as a whole. It is case-study bound, and there is no clear indication that the results of the study would be the same for all pre-primary schools.

Formulating an in-depth explanation of the use of the playgrounds for sensory stimulation and development of the participating pre-primary schools improved transferability to other cases, as explained in section 5.5.

5.6 THE POSSIBLE CONTRIBUTION OF MY STUDY

This research supplements previous studies on the use of outdoor learning environments for sensory and motor development from a South African educator's perspective and research on sensory and motor development for school readiness. It also investigates the aspects of children's educational experiences in nature and the discourse on the value of the outdoors for cognitive development. Moreover, this study may prompt studies about the use of the rubric proposed in Appendices 2 and 3 to rate the design and use of outdoor learning environments in Gauteng, and possibly the rest of the country as well. It therefore suggests a framework that can be used as an assessment tool as well as for further research in this country and abroad.

5.7 RECOMMENDATIONS

The following recommendations for further research, training and practice are made based on the literature review in concert with the data analysis.

Recommendations for further studies:

❖ **Recommendation 1**

The Grade R class needs to be observed for the full day for an entire week to really gain a true perspective of the facilitation of learning that takes place outdoors. The short observation during free play for a small part of the day is not a complete reflection of the day's activities, and the researcher relied on the statements of the Grade R teachers to give an account of the rest of the day.

❖ **Recommendation 2**

A further study should focus specifically on how to make a playground a natural environment when the playground is not really situated in nature. I have only addressed it to a limited extent in this study. This is based on the comment that one of the teachers in the interviews made: *"Yes. I think you can learn from nature. Obviously it is very difficult. We're not really in nature here." Teacher 2 – p14.* One of the key

aspects in this study was exploring the significance that the natural environment plays in the development of the young child (Fikus & Luchs, 2013: 208-209). Further research should move a step beyond this, focusing on nature-orientated playgrounds in particular (Fikus & Luchs, 2013:208-209).

❖ **Recommendation 3**

The combination of indoor and outdoor learning needs to be taken into account in more detail and for the full duration of the school day.

❖ **Recommendation 4**

Further research is needed to study how the duration of outdoor free play among preschool outdoor play environments impacts on activities. This could lead to interesting findings that would positively impact on whole-child development. More research is also needed to study how adult involvement affects children's behaviour, learning and development during outdoor free play (Pigott, 2012:115).

❖ **Recommendation 5**

The study only focuses on sensory and motor development and did not include socio-emotional development through spontaneous exploration; therefore it did not cover holistic learning to the full extent. Holistic learning is presented in some of the rubrics, although it was not the primary focus of the study.

Recommendations for training and practice

❖ **Recommendation 1**

Herrington, Lesmeister, Nicholls, & Stefiuk ((n.d.). *7 C's.* CHILD: Consortium for Health, Intervention, Learning and Development) pointed out that their "study should be used in concert with existing codes, safety regulations, and design guidelines."

I did not include fire in any of the recommendations, as it is illegal to have an open fire at school in South Africa, although it is used in countries such as Denmark as part of their outdoor education.

❖ **Recommendation 2**

It is important to remember that it is necessary to use methods in the design process that take into consideration the location of the particular playground (Jansson in Refshauge et al., 2013:2) and not to assume that one playground design could fit all locations.

5.8 CONCLUDING REMARKS

In this study I investigated the design and use of an outdoor learning environment for sensory and motor development by making use of a qualitative approach. This approach was valuable to this study because it enabled me to get face-to-face, in-depth information from the participants on how perceptual development

takes place on the playground. The purpose was to identify favourable environments and ways to modify existing learning environments optimally from the perspectives of educators noted as important in the introduction to the study (Rushton et al., 2010:354).

The data collection instruments were also valuable and enabled me to draw up a site map, site inventory, rubric of the features of outdoor playground settings for sensory and motor stimulation and a rubric of the design and use of an outdoor learning environment for whole-child development for each site. These, together with the interviews and observation notes, gave rise to themes and sub-themes that enabled me to compare the data with the existing literature that was discussed in this last chapter. From this comparison, I was able to answer the research questions and add to the theoretical framework of the study as my contribution to this research topic.

Further research could build on and extend this research by exploring how the classroom and playground could become interactive, with reference to what is experienced in the outdoor learning environment and reflected, conceptualised and consolidated in the classroom. The classroom can build on the prior knowledge gained by the child's experiences in the outdoor learning environment. While more study is necessary, it was possible to establish a set of design principles or concepts that foster better teaching and learning environments.

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ADDENDA

Addendum 1:
Summary of relationship between natural environment and play (Woolley & Lowe, 2012:58)

Addendum 2:
Rubrics for features of outdoor playground settings for sensory and motor stimulation

Addendum 3:
Rubrics for the design and use of an outdoor learning environment

Addendum 4:
Table of gross motor and fine motor skills (De Witt & Booysen, 1995:90, 91)

Addendum 5:
Table of theories on periods of cognitive development of the young child

Addendum 6:
Field notes of all three case studies

ADDENDA (ON CD)

CD Addendum 1:
Consent letters to principals, teachers, parents and learners

CD Addendum 2:
Semi-structured interview questions and interview transcripts

CD Addendum 3:
Photos and video recordings

CD Addendum 4:
Table of perceptual skills

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Addendum 1:

Summary of relationship between natural environment and play (Woolley & Lowe, 2012:58)

Table A summary of the relationship between the natural environment and play (Woolley & Lowe, 2012:58).

Natural element	**Play opportunities or play value**
Landform	Excellent for physical play: changes in levels for climbing, rolling, jumping and sliding. It can also be adapted to provide a sense of enclosure and open, high and low spatial experiences.
Vegetation	Use of trees and shrubs within an environment can add aesthetic, creative and educational value. Can be used for dens or as an educational tool when teaching children about the environment and seasonal changes.
Materials	Wood, water, sand, stones and vegetation can offer educational and creative stimulation. Boulders and rocks provide for physical, imaginative dramatic, social and fantasy play.
Moving/loose parts	Closely linked with the provision of materials, but beyond the stimulation of a tactile environment, moving/loose parts can enhance creative and imaginative play and allow a child the opportunity to interact with and make sense of their environment.

Sources: Lady Allen of Hurtwood (1968); Maudsley (2007); Moore et al. (1992); Nicholson (1970); Woolley (2008) in Woolley & Lowe (2012:58)

Addendum 2:

Rubrics for features of outdoor playground settings for sensory and motor stimulation

SCHOOL1

SCHOOL2

SCHOOL3

School 1

School 2

School 3

School 1

School 2

School 3

Addendum 3:

Rubrics for the design and use of an outdoor learning environment

Template

School 1

School 2

School 3

Template

Addendum 4:

Table of gross motor and fine motor skills
(De Witt & Booysen, 1995:90, 91)

Addendum 5:

Table of theories on periods of cognitive development of the young child

Addendum 6:

Field notes of all three case studies

Table 4.1 Features of outdoor playground settings for sensory and motor stimulation – School 1

PLAYGROUND AREA	FEATURES OF AREA	SENSORY STIMULATION	MOTOR STIMULATION	COMMENTS
Play House 	Brick built playhouse with tin roof and concrete floor. It has child sized furniture inside. The playhouse is in a shaded area but the sun shines through in front of the entrance making the playhouse light inside.	- Visually stimulating with painted entrance to playhouse and view of activity on rest of playground through windows - Sense of inside and outside - Feeling texture of wire furniture, wooden chairs, concrete floor, painted enamel wall. - Feeling of texture of loose parts brought into playhouse such as sticks and leaves.	- Sit on chairs and on floor - Kneel on furniture, and floor - Sit on hunches - Fine motor skills, hold the loose parts such as sticks and leaves.	Children brought loose parts such as leaves and twigs inside the playhouse from the Jacaranda trees etc. Popular with both the boys and girls.
Grass area 	Almost completely semi-shade. Open grass area surrounded by a pathway.	- Visual stimulation of green grass, outdoor activity beyond school fence. - Texture of grass when collecting loose parts between the blades - Hear the wind in the trees and the outside traffic and activity	- Fine motor stimulation when picking up loose parts in grass	Grass had been replanted and was camped off at the time of observation. Picked up loosed parts in the grass from the pathways as far as they could reach without entering the grass area.
Merry-go-round 	Area surrounded by a border of colorfully painted tyres. Shade from trees and from canopy with shade net.	- Sense of movement - Feeling of cold steel, rubber surface of ground cover with hands and feet - Visual stimulation of colorfully painted tyres, view of the spinning playground when moving on the merry-go-round.	- Run on rubber surface - Sit on merry-go-round, tyres, rubber surface - Kneel - Stand on merry-go-round, rubber surface - Push the merry-go-round - Pull the merry-go-round - Hang - Crawl - Jump over tyres to enter area	The merry-go-round was used by two or three children at a time. There wasn't prolonged play in this area, but it was more a transition area to other areas

Pathways  	Semi-shade and sun. Two pathways are distinguished First pathway is rubberized around grass area and leading to and linking playground with concrete paved painted pathway leading to gardens and buildings.	- Feeling of loose parts and rubber and paved surface of the pathways. - Visual stimulation of loose parts of berries / twigs/ leaves, outdoor activity beyond fence, vegetation of rose bushes, trees, flowering jasmine, rosemary bush, colorful pot plant flowers. - Smell the budding jasmine and rosemary bush when brushing past it on the pathway. (Roses were not in bloom yet.	- Walk - Stand - Kneel - Squat - Sit on hunches - Bend - Fine motor pick up loose parts with pincer grip	The pathways were not used much on day one but was very popular on day two. Picked up loosed parts in the grass from the pathways as far as they could reach without entering the grass area.
Tyre swings 	One set of rubber tyre swings to sit in. Area has one tyre border on two sides. Semi-shade.	- Feel texture of bark of tree, loose parts consisting of leaves and twigs, steel chain, rubber of tyres, wooden poles of swing, rubber of ground surface, wind when swinging. - Visual stimulation of colorful tyres and rainbow painted on white wall behind swings. - Hear traffic, birds, and wind in trees.	- Push swing - Kneel on rubber surface - Crawl - Run and catch a friend - Standing on swing and on rubber surface - Lie on rubber surface - Roll over when lying down - Swing - Lean against tree	Quite popular one day one but less popular on day two with only about two children interacting with the area.
Small steel hanging frame.	Sun. The frame can be moved easily to different locations	- Feeling of steel of structure, rubber ground cover. - Visual stimulation of different painted colors od structure	- Hang - Stand on rubber surface	Bigger children did not use this structure.

				
Roller bar 	Shade.	- Feeling of motion, steel roller under feet, rubber ground surface, texture of loose parts sticks and leaves - Visual stimulation of colorful tyres and rainbow painted on white wall behind swings. - Hear sound of the roller bar when running on it.	- Run on roller - Kneel on roller, rubber surface - Sit on roller, rubber surface, tyres - Lie on rubber surface - Roll over when lying down - Hang on pole of roller bar - Walk on knees - Sit on hunches - Roll roller with hands	Used roller bar to chafe through sticks to “do marshmallows“. Area quite popular on day one but with no activity taking place here on day two.
Big wooden climbing structure – (Jungle Gym) 	Shade and semi-shade.	- Sense of height - Feeling of texture of wooden structure, steel chains of ladder and drum, rubber ground surface under feet, rubber of tyre ladder, rope of knotted netting. - Feel semi-shade, bark of trees - Visual stimulation of high trees, colourful rainbow on white wall, outside life over wall when standing on structure. - Hear birds, wind in trees, life outside school such as traffic, pedestrians etc. - Visual stimulation, see rain water mix with sand in the steel drum groove - Feel texture and shape of loose parts such as leaves, twigs, berries	- Climb up and down chain ladder, ladder tyres. - Slide down on tummy - Balance on pole stumps and balance beam - Sit on platforms, rubber surface - Lie on structure, under structure on rubber surface - Stand on structure platforms, under structure platforms - Hang - Run - Kneel - Walk over chain swinging bridge, on rubber surface, under structure, next to structure	Quite popular area on structure and under and around structure. Manipulation of loose parts e.g. twig was pushed into berry and used to mix water and sand in a groove

				
Shaded Hanging swings, monkey bars, and balance beam 	Shade.	- Sense of motion - Feel with hands the texture of plastic rope, steel, wooden and rubber handles, loose parts such as leaves - Feel with feet the texture of rubber ground surface and wooden balance beam	- Hang on and from swings / wooden ladder of monkey bars - Swing - Balance - Walk on balance beam and rubber surface - Stand on balance beam and rubber surface - Run - Spin - Kneel - Squat next to structure - Crawl under wooden ladder of monkey bars - Climb wooden ladder of monkey bars - Hold and pick up loose parts such as leaves	No child on monkey bars on day one or two except for slight use of the wooden ladder leading to the monkey bars. Swings were quite popular on day two with good use of two types of swings.
Shaded Sandpit 	Shade and semi-shade.	- Feel the texture of sand, plastic sandpit toys, twigs and leaves, berries, rubber surrounding ground surface, sand on rubber surface - Hear the birds, traffic, children talking and laughing	- Sit in sand, on rubber edge, on tyre surrounding sandpit - Kneel in sand, on rubber surface - Balance on tyres - Climb over tyres - Dig with hands, fine motor stimulation - Dig with shovels, gross motor stimulation - Flick sand with fingers - Scoop sand up in cupped hands - Squat - Sit on hunches	Not very popular on day one but very popular on day two. Playing with sand around sandpit

			- Lying down	
Shaded Trampoline 	Shade from trees and shade net canopy. Trampoline in a steel fence boxed area.	- Feeling of motion jumping up and down - Feeling of rubber cushion mats covering springs surrounding trampoline. - Feeling of textures of loose parts such as leaves and twigs, texture of trampoline mat, steel fence box. - Visual stimulation can see into the car park, can see passing pedestrians and movement. - Hear traffic, sound of trampoline when jumping, sound of mats flipping while jumping.	- Lie down - Sit on trampoline and rubber mats - Jump - Kneel - Crawl	Quite a popular area.
Small steel structure with slide (Jungle Gym) 	Shade.	- Feeling of loose parts plastic sandpit toys, twigs, berries, leaves, steel of structure and slide, rubber of ground surface	- Swing - Stand - Sit on slide and rubber surface - Walk around structure - Sit on hunches - Fine motor manipulation of loose parts such as twigs and berries and leaves	No older children played here on day one. Much activity of older children here on day two.
Medium steel structure with slide (Jungle Gym) 	Semi-shade.	- Feel steel of structure, rubber swing, rope of knotted netting, rubber ground surface, loose parts such as leaves and seeds from tree, plastic sandpit toys, plastic ball - Felling of height - Feeling of sliding	- Climb - Sit - Swing sitting sand standing - Stand - Slide - Hang from - Fine motor pick berries from tree and collecting of loose parts - Squat - Sit on hunches - Catch ball rolled down slide - Reach for high branches / stretching - Lie on back, tummy and side. - Kneel	Moderately popular on day one. Very popular on day two. Could be popular due to the teacher sitting close to this area. They arranged the loose parts (berries) into formations and shapes where the teacher was sitting.

				
Shaded Pole with tyres and chains 	Shade.	- Visual stimulation of colorfully painted tyres - Feeling of textures of steel chains, rubber tyres, wooden pole, rubber ground surface.	- Pull on tyres	Not very popular. Only one child pulled on some of the tyres when passing by.
Sensory table area 		- Feeling sunshine, steel table, wooden table, concrete floor	- Sit on table - Stand next to table - Lie on table	There were two tables for sensory play but they were covered the days that I observed. One is in the shade and the other is in the sun. No activity took place here except 1 or two children resting on it. No activity in these areas on day two.

				
Long slide steel structure with climbing net 	Shade.	- Feeling of motion - Hear the birds in the trees above slide, the sound of sliding down on the steel slide - Feel steel of structure, rubber of ground cover, plastic of knotted climbing net	- Climb up slide and on and through structure - Slide down - Stand on slide, rubber surface - Bend over slide - Walk around apparatus - Pick loose parts up with pincer grip (fine motor) - Hang from structure - Sit on slide and structure	Not very popular among the bigger children. Only one child interacted with this structure on day one. More popular on day two. A child also let loose parts roll down slide. No children climbed on the climbing net on day one or two, but only touched it passing by.
Shaded gathering area 	Semi-shade.	- Feeling of different texture of concrete tiled surface - Feeling of semi-shade	- Sit - Kneel - Stand - Run - Crawl - Pick up loose parts with pincer grip	Children looked for and collected loose parts such as twigs or berries in the slots between the tiles. This area is also used in the afternoons for art activities or play dough, or blocks etc. I did not observe this however in the morning sessions that I observed.

				
Vegetable garden and flower beds   				No children were found in this area during these two observation days although this area offers much sensory and motor stimulation and apparently the children use the garden from time to time.

A-frame steel structure with climbing net on grass 		- Feel steel structure and plastic of netting, grass under feet	- Climb through and over - Squat underneath and next to - Stand next to - Fine motor use pincer grip to pick up loose parts under and next to structure	This apparatus was not camped off as was the rest of the grass
Paved area and plastic mat for riding bicycles and movement activities 				I did not observe any children playing in this area the two days that I observed. I only saw them doing planned movement activities with an instructor. Apparently this area is used in the afternoons for riding bicycles and also for formal movement classes in the mornings.
Underroof area 				Apparently this area is also used in the afternoons for play and riding bicycles. In the mornings it is used for the formal movement periods.

Table 4.3 Features of outdoor playground settings for sensory and motor stimulation - School 2

PLAYGROUND AREAS	FEATURES OF AREA	SENSORY STIMULATION	MOTOR STIMULATION	COMMENTS
Open Space 1. Kiddi Gym Day 1 	Large open grass area. Mostly sun and very little semi-shade.	- Feeling warmth of sun on plastic of kiddi gym apparatus\ - Feeling of plastic itself of kiddi gym - Feeling grass under their feet - Feeling sunshine on their skin - Feeling the wind blowing - Hear each other's voices / laughter / shouting /traffic / birds / airplane - Seeing the different colors of the kiddi gym / birds	- Squatting - Climbing over / under / through - Crawling under / through - Jumping off / over - Sliding off - Sitting on - Walking around - Carry / place / arrange / pick up - Standing on - Balancing - Running - Kneeling - Sitting on hunches - Lying down - Rolling - Rough and tumble games	Very popular area with most of the activity taking place here on day one. Children were engaged in this area for the full duration of the play break. The kiddi Gym was available to them as loose parts on this day. It consists of different foam shapes and a tunnel etc. The children pack the kiddi gym out at the beginning of break time in their own preferred style. They pack the apparatus back in the storeroom again when break time is over. They help each other carry the big pieces. This area has full sun.
2. Hoops, balls and shooting stars Day 2  	Large open grass area. Mostly sun and very little semi-shade.	- Feeling plastic of hoops and balls - Feeling tin foil of shooting stars - Feel heavier and lighter stars	- Grasping hoola hoops - Hoola-ing - Kicking - Running - Throwing balls / hoops / stars - Picking up balls / hoops / stars - Sitting - Catching - Bouncing - Hitting the ball - Carrying balls / hoops - Skipping	Climbing other structures to through the shooting stars from. The children take the loose parts to other parts of the playground.

3. Red loose standing steel climbing structures (3)   	Two frames are in full sun, the other frame is in semi-shade. The frames can be moved to different locations.	- Feeling of steel - Seeing the red of the painted structure	- Climb on and over - Sitting on - Jumping on and from - Hanging from	There are three of these loose standing structures, two in full sun and one in semi-shade. The structures attracted passing by interest and the one in the middle of the playground attracted the most visits. These structures were also used for rested places.

Sensopathic play area 1. Bubble table 	There are two sensory table areas. The smaller tables are used in the sun and the bigger sensory trays are in semi-shade. The bigger sensory trays in the semi-shade are not used often because fine leaves fall into the trays. These bigger trays can accommodate more children, but are currently mostly used to wash equipment.	- Blowing bubbles - Feeling of smearing soapy cream on table and making foamy stripes - Feeling of soapy water on hands while playing in the water - Feeling foam	- Standing - Blowing (fine motor) - Holding bubble stick - Washing table with hands - Smearing with hands and fingers - Scooping water - Holding water in cupped hands - Blowing bubbles through cupped hands	Interest for full duration of the play time. Popular activity. Full sun area. Used sponges
2. Goop table  		- Lots of sensory talk among each other of how they are experiencing it e.g. ice cream that is melting in the sun, hard and then water - Feeling a solid becoming a liquid when scooping it up - Smelling it - Look at the color - Feeling the consistency of the mixture change from hard to liquid.	- Fine motor scooping it up - Scoping it together with fingers / hands - Mixing glitter in - Pouring from one hand to the other - Wiping it off their hands and off the table - Smearing it on the table and on their hands - Picking it up with fingers - Pinching it between fingers - Rolling balls between hands - Passing the handmade balls from one hand to the other - Squashing balls - Letting the goop drip	Full sun area. It was a less popular activity that the bubbles. Some children totally avoided this activity. The teachers had to ask some of the children if they wanted to play in the goop and the answer was no.

Other sensopathic areas 				
Block area 	Concrete floor covered by two loose carpets that the blocks are built on.	- Feel wooden blocks - Feel the weight of the different sizes blocks	- Building / stacking (fine motor) - Standing - Walking - Sitting - Squatting - Kneeling - Crawling	This is an underroof shade area. Only engaged in the block area on day two. About five to six kids played here for a part of the play break.
Swing area 	Two sets of rubber tyre sit swings. One hand swing. Semi-shade area.	- Motion of the swing oscillations - Textures of the steel chains and the rubber tyres	- Jump off swings - Hanging on with arms / legs - Sitting - Swinging - Standing in line - Sit-ups - Body swing around by arms - Climb over tyres to enter swing area	The swings were part in sun and part in shade. Boys used the term exercise while counting their sit-ups. Swings were less popular on day two. Moderate use of swings on day one and two.

Flower garden 	Children planted their own flowers in the plastic containers on the wall shown in the photo. The rest of the flower bed was filled with colorful flowers and lavender.			
Bicycle track area  	Paved brick area, concrete area. Track / path makes several loops. Connects most of the playground. Mostly sun, but also some semi-shade areas.	- Feeling of different textures concrete / paved bricks - Motion - Feeling of rubber handles /wooden seat / steel frame of the different tricycles. - One child stopped and listened to a passing airplane while riding the tricycle.	- Riding tricycles / cycling (gross motor) - Standing - Sitting on concrete and on tyres bordering track - Running on and over track - Walking - Pushing each other on tricycle - Jump over tyres to get to bicycle track - Run very fast / high intensity movement	Popular on day one and two. Activity increased as play time elapsed. Sometimes stood in groups chatting on track. Solitary play and also in pairs pushing each other or in bigger groups running.

				
Sitting / resting areas   	Two child sized moveable plastic picnic table and bench sets. One adult size concrete bench in shade. Concrete table and bench set in sun.	- Feeling cold concrete of the concrete benches in the shade and warmth of the concrete benches in the sun - Feeling concrete versus wooden benches.	- Sitting - Standing	Children only sat on benches during day two

				
Big play structure / Jungle gym in sand 	Wooden structure surrounded by sand and with a border made of tyres. Semi-shade from a tree in the sandpit and shade that the structure itself makes, the rest of the area is full sun	- Sense of height - Sensation of warm sand in sun and cool sand in shade - Feeling the texture of the ropes / wooden poles / sand / loose parts such as leaves / rubber tyres	- Sit on tyres - Jump over tyres - Climb up and down ropes - Hang on ropes - Sit on jungle gym - Walk over bridge - Lying down - Balance on tyres - Crawl in sand - Roll in sand - Sit in sand - Lie in sand - Burying stars	This area is in semi-shade. Attracted by passer activity. Not highly popular and short durations of play.
Under cover sandpit 	Sandpit situated in the corner of site. It has a tile roof and therefore in full shade but with good natural light as sides are open with very low brick wall border.	- Engaged in sensory play - Feeling of sand with hands and feet - Feeling of the cool shade when entering the sandpit from the warm sunny playground - Feeling falling sand between fingers - Loose parts sand toys e.g. spade and bucket etc. - Weight of sand - Filling things with sand	- Sitting in sand or on brick ledge of sandpit - Fine motor 'cooking ' - Crawling - Squatting - Kneeling - Walking - Jumping into sandpit over wall	This area is in shade under a roof. As it became hotter the children sought out the cooler play spaces. The same amount of children played in the sandpit on day one and day two, it seemed that the children were mostly also the same children that played there the previous day.
Play House	Brick playhouse with tile roof, concrete floor, double wooden swing door, and two wooden window shutters. Child sized furnishings. Brick paving around playhouse and pots with plants. Concrete	- Smell the lavender in the pot next to the play house door - Feel the prickly fern in the other pot outside the window of the play house - Feel the cool of being inside the play house after coming in from the sunny playground	- Stand - Walk - Sit - Fine motor play with loose parts - Run into	The pay house provides a shady area inside and behind the playhouse. The play house had very little attraction on the first day but it was very popular on the second day with much activity in and around the play house. On day one it seemed lacking of enough loose parts

	picnic table and bench set outside playhouse with some grass and a little garden.			except the bigger furniture pieces and keyboard. Day two children brought some loose parts in themselves. The boys played running games around the playhouse area and ran into the playhouse often.
Big wooden tree house climbing structure / Jungle gym 	Situated next to the classroom under a very big Jacaranda tree providing semi-shade. Surface of grass and soil.	- Feeling of height - Feeling of motion on slide - Feel wood of structure / steel of chain ladder and sliding pole / plastic of slide	- Sliding down slide / pole - Bend - Walking - Sitting and swinging legs - Swing on ladder - Climb chain hanging ladder and wooden ladder	This area is in semi-shade under a big tree. It was not very popular the first day but enjoyed more visits the second day. Day two the children took the balls up into the tree house and down the slide and pole although they were later reminded that they are not allowed to do that.
Stoep area 1. Blackboard area 	The stoep is covered by a roof. Children gather here at snack time to collect their food or line up before class time or interact with the teachers and assistants in this area. The black board area is also on the stoep but forms a separate activity area.	- Feeling of chalk between fingers and on board - Hearing the sound of chalk drawing on board - Making drum sounds with the empty chalk container and a ruler. - Feeling the wet cloth when wiping the board clean. - Seeing the wet board when wiped versus the dry board when dried	- Wiping the board clean with a wet cloth - Fine motor drawing and grasping of chalk - Hitting the empty container to make a drum sound - Standing - Sitting - Sitting on hunches - Kneeling	This area is shade. This area also become more popular as playtime evolved. There was activity on day one and day two.

2. Teacher area 			- Run - Stand - Sit	This is a shade area under roof. The teacher mostly is stationed here so children come to her if they seek her attention about matters.
3. Paving in front of stoep 		- Feeling of paved bricks - Seeing the wind in the leaves - Hearing the bird sin the tree - Feeling the semi shade versus the sunny areas. - Touch the nest that that fallen out of the tree - See water running down the paved slope when apparatus is being washed	- Running - Riding bikes - Walking - Sitting - Standing - Holding	This area is semi-shade under a big tree.
Smaller wooden climbing structure – monkey bars and balance beam 	Grass surface. Surrounded by tyres to form the border and is also used as sitting places during snack time or when children rest from play.	- Feeling the wooden structure - Feeling the rope of the knotted net - Feeling the tyres that surround the structure	- Sit on tyres and on structure - Jump over tyres and down structure - Hang from monkey bars and rest of the structure with arms and legs - Balancing / walking / kneeling / sitting on balance beam - Climb up wooden ladders - Grasp knotted net with hands and fingers	This area is in semi-shade under a big tree. This area was largely empty on day one but was very popular during pack up time of the loose parts in the shed because the shed borders this structure. Day two the structure was visited throughout the play break and more popular than day one. The children wanted to show off cool tricks on it. (on swings as well)

Table 4.5 Features of outdoor playground settings for sensory and motor stimulation – School 3

AREA / SETTING: Playground 1	**FEATURES**	**SENSORY STIMULATION**	**MOTOR STIMULATION**	**COMMENTS**
Swing area 	One tyre seat swing set and one wooden flat seat swing set both on wooden pole frame. Area has tyre border on two sides, low wall border on other side. There is a balance stump at the end of a row of border tyres. Full sun area.	- Feel texture of steel chain, rubber of tyres, wooden seats, and wooden poles of swing structure, grass surface, motion and wind when swinging, sun shining on face. - Visual stimulation of green grass, seeing children running on playground - Hear birds, wind in trees, children singing and laughing, airplane.	- Crawl - Standing on swing and on grass - Swing - Balance / walk on tyres and low wall - Climb over tyres - Sit	Popular on both observation days.
Smaller wooden structure area 	Smaller wooden structure with slide (Jungle Gym Tree House) with tree growing next to it and laid concrete circles. Semi-shade and sun.	- Feel texture of bark of tree and smooth trunk were bark is worn off, coarse concrete circle pavers, loose parts consisting of leaves and twigs, wood of structure and plastic of slide, rubber of tyres, grass. - Visual stimulation, can see outside activity of neighbors over fence. - Feel a sense of height and can touch branches and leaves of tree - Hear the birds and children playing.	- Jump from structure and tree, jump on concrete circles with one leg, two legs. - Hang from structure and tree - Climb up and down structure and tree - Slide - Sit on tree trunk and structure - Walk - Balance - Squat / sit on hunches - Pick up loose parts with pincer grip (fine motor) - Run - Stand on two legs, one leg.	The wooden structure is next to a tree and the concrete circles are laid in the ground next to the tree. The children play on the ground beneath the structure. Tree trunk forms a balance beam. Children play hop scotch on the circles.
Big wooden climbing structure in sandpit – (Jungle Gym) 	Sun and shade made by structure itself over part of sandpit.	- Feel sense of height - Feel texture of sand, wooden structure, steel chains of ladder, rubber of tyre ladder, plastic of rope and sandpit toys. - Feel shade under structure and cold sand versus sunshine and warm sand. - Visual stimulation of colorful sandpit toys - Hear birds, wind,	- Climb up chain ladder, ladder tyres, rope. - Sit on platforms, in sand, on wall. - Lie on structure, under structure - Stand on structure platforms, under structure platforms - Hang - Walk over chain swinging bridge, on sand and surrounding wall - Kneel - Squat / hunch - Crawl - Dig with hands, fine motor stimulation	Quite popular area on structure and under and around structure. As the day gets hotter, the shade in the sandpit becomes more and more popular. Loose parts are sandpit toys and leaves and blocks and other loose parts also make their way into the sandpit from time to time.

			- Dig with shovels, gross motor stimulation - Flick sand with fingers - Scoop sand up in cupped hands - Fine motor pincer grip of loose parts in sandpit such as leaves - Pour sand, sweep sand up from astro grass.	
Steel A-frame, monkey bars and climbing structure 	Sun and shade.	- Feel warm and cold steel, grass, warmth of sun, cool of shade. - Hear birds, children's voices.	- Hang on frame with arms and legs - Balance - Stand on structure and on grass surface - Sit - Climb - Kneel	Very popular. Children show off their tricks and skills and ask each other 'Can you do this?'
Open grass area and low wall 	Sun. Very little shade forms by Big Jungle Gym in sand. Area slightly sloped to the one side.	- Hear children's voices - Feel grass under feet, plastered painted wall, sun shining on their face - See green grass, children performing on the wall.	- Stand on wall and grass - Skip - Balance on wall and on tyre border. - Walk - Run - Sit on hunches and on wall - Kneel - Climb on wall - Jump off wall - Dance on wall and grass - Fine motor movements (small hand motions) when saying rhymes and performing songs - Bend	Group activities take place here, with games and rhyme and song performances on the wall.
Bicycle track	Mostly paved brick but a part of it is astro grass and the back part is concrete. The bicycle track goes right around the perimeter of the playground. The playground is slightly slanted forming either an uphill or a downhill depending on which side you	- Fell the paved bricks, concrete, astro-grass under feet. - Feel the wind of fast movement and motion of bicycle. - Feel the plastic of the cars, rubber of bike handles, steel of bike frames, - Feel warmth of sun in sunny areas and cool of shade in shaded areas and the difference when moving from the one to	- Hop - Squat / hunch - Sit on cars, bicycles, paving, astro-grass and concrete. - Push bicycles and each other on cars - Walk - Triple - Stand - Run	Very popular area.

 	cycle from. Some areas sun and other areas shade.	the other. - Hear the sound of the bicycles riding on the different surfaces of paved brick, astro grass and concrete.	- Dance - Ride bicycles and cars - Different movements with kick bikes and pedal bikes etc. - Pick up, carry and build with loose parts such as blocks	
Bicycle storage areas 	Platform area has shade and corner ground level area has sun and shade. Platform area has astro grass, corner ground level storage has a paved brick surface. There are eight different types of bicycles and tricycles and cars.	- Feel shade, astro grass, and surfaces and textures of different types of bicycles and cars such as plastic, steel and rubber. - Sense of elevation - Visual stimulation of colorfully painted wall. - Hear birds, children's voices.	- Sit - Lie - Kneel - Crawl - Dance - Jump on and off platform - Stand - Climb up and down - Ride Bicycles and cars - Different movements with kick bikes and pedal bikes etc. - Pick bicycles up - Grip and push one wheel bikes - Clap hands (hand games)	Platform area popular with much activity, ground level not very popular with little activity.

				
Three medium steel structures  	Sun.	- Hear birds, sound of bicycles riding past, children's voices, steel steering wheel of structure churning. - Feel steel of structure, rubber of tyres and swinging motion when hanging and swinging from structure, grass under feet, sun shining on face. - See different colours of structure	- Climb - Sit - Swing - Stand - Hang from - Jump - Balance - Walk	Moderately popular and also used for fantasy play.

Bench areas  	One bench is in the sun and another bench is in semi-shade.	- Feel the plastic of the benches, sun on faces, concrete under feet. - Hear the birds, children's voices, bicycles riding past.	- Sit - Stand	The shade bench was used often and also more towards the middle and end of playtime.
Open astro grass area including two sensory tray tables  	There are two sensory table areas. The smaller table is used in the sun next to the sandpit and the bigger sensory tray is in the sun in the morning and shade in the afternoon. The astro grass area covers a level change which includes an incline and a set of stairs.	- Feeling sunshine, plastic tray tables, astro grass, plastic apparatus, and texture of rice and water balls and feeling of wet and dry, feeling different weights. - Visual stimulation of colorfully painted walls, different visual qualities of the loose parts in the tray tables such as colors and volumes	- Stand - Run - Squat / hunch - Kneel - Sweep - Pick up loose parts with pincer grip from trays and from astro grass - Fine motor pouring contents of sensory tray tables from one object to another. - Rolling water balls between hands	There were two tables out for sensory play although I took note that they have three tables. Both were placed in the sun. The attraction of these tables was the novelty of the new experience. The water balls were extremely popular and the rice was moderately popular. Children did not really like the texture of rice. Lots of sensory talk heard at these tables such as: "They're very water". In summer there is much more water play going on. There is constant traffic over the astro grass as it is a central area and also where

				the teachers position themselves thus attracting children to them who have questions or queries etc.
Steel swing structure 	The steel swing is painted in green, yellow, red and blue. It is situated on the grass in the sun.	- Feeling of motion, steel of swing, sun on face and grass under feet. - Hear the birds, children's voices, the creaking of the steel swing. - See different colours of structure	- Climb up and down - Stand on swing and grass. - Hang - Sit - Swing - Squat / hunch - Pincer griped used to pick grass blades.	Sun. Moderately popular.
Underroof area with picnic tables and loose parts / block area 	There are picnic tables and loose parts / block area. Shade- underroof.	- Feeling of astro grass, plastic of picnic benches, sandpit toys, McDonald toys, wood of wooden blocks. - Feel the coolness of the shade when they come in from the sunny areas into the shady area. - Visual stimulation of colorfully painted walls and colorful loose parts.	- Sit - Kneel - Stand - Run - Jump - Bend - Hold	The benches are mostly used at snack or lunch time. This area is also used for outdoor play when it is raining. The children play with loose parts such as blocks that they also carry onto the other parts of the playground.

AREA / SETTING: Playground 2	**FEATURES**	**SENSORY STIMULATION**	**MOTOR STIMULATION**	**COMMENTS**
Sandpit 	Sun and shade.	- Feel cold sand versus warm sand, feel texture of water, wooden poles of climbing structure, sand, water and sand mixed, plastic of sandpit toys, glass of hidden treasure.	- Carry - Squat / sit on hunches - Stand - Kneel - Dig - Sit on edge of sandpit - Dig with hands or with sandpit toys in sand. - Manipulate sand with hands - Mix sand and water - Pour water into sand - Drop and pick up loose parts such as plastic animals etc.	Very popular area. Much sensory talk taking place for e.g.: “This is an experiment, get your hands wet, we’re making mud. Why did you put water in there, now you have to get more dry sand, pour this out?”
Wooden climbing structure (jungle Gym) 	Wooden climbing structure consists of a tyre ladder, a fireman’s pole to slide down, wooden stairs, a hanging bridge, and two look-out towers. The structure is built over the sandpit..			Not used on the days that I observed due to excitement of water play in the sandpit but usually quite popular.
Paved area dirt section and painted wall area	Semi shade, shade and sun.	- Visual stimulation of the colorful goal-net painted wall, big green overhanging tree. - Feel coarse texture of paving under feet and when writing on it with chalk. - Feel texture and weight and form of loose parts such as leaves, balls, chalk, and rackets. - Hear birds, wind blowing through leaves, sound of bouncing balls, sound of bat hitting ball.	- Pincer grip used to write with chalk on paving. - Jump - Kick - Throw big and small balls - Hit a ball - Run - Walk - Stand - Sit	Very popular area. This area included a ball hoop mounted against the wall but it was not used on the days that I observed. The teacher indicated that it is quite popular though. The area also included a loose small trampoline which the teacher asks them to jump on if they become restless in class. I did not see it

 				being used during free play though. They write with chalk on the paving.
Grass area 	Some areas sun and some areas shade.	- Feel texture of grass, loose parts such as leaves, pods, glass stones and sand pit toys. - Hear children's voices, traffic from street, doorbell, birds, and wind chime. - Visual stimulation of green grass and colorful vegetable garden that is in the corner of the grass area.	- Kick - Run - Throw - Dribble - Walk - Stand - Carry buckets of sand or water - Open and close tap	Grass area is used to access other areas. Children have acess to a tap on the grass area which they use to get water from fro water play and play in the sandpit.

Tyre swing set area 	Semi-shade. Consists of two sitting tyre swings.			Not used on the days of observation. Teacher noted that swings are used but that the flat wooden seat swings on the main playground are more popular that the tyre swings.
Vegetable garden 	4m 2m garden with 8 painted tyres in to allocate sections to the garden and to prevent children from walking on the plants.	- Visually stimulating due to colorfully painted tyres that are seen from any point on the playground.		Not used on the day that I observed. There were some vegetables growing in the garden though such as carrots and beans. The teacher noted that they plant beans and sunflowers as soon as the weather is warmer in spring and summer. Then the children water the garden themselves.
Flower bed 	Flower bed included a rose bush, and two other kinds of flowers. It also contained a medium sized rock that children could sit on but too big to move.	- Visual stimulation of the flowers, people walking to the entrance. - Smell of the flowers - Texture of the plants and the rocks in the garden and the soil.	-	The children did not engage with this area on the days of observation but the teacher indicated that they do enter the area and pick up stones or sit on the rock.

Table of rubric for the design and use of an outdoor learning environment for whole child development

	Whole Child Development	The design and use of the outdoor learning environment provides for these points on a scale of 0-5 0 being least and 5 being most					
		0	1	2	3	4	5
Aim (Goal) The goals of an outdoor play environment are to stimulate:	Physical activity						
	Self-knowledge and self confidence						
	Learning how to assess risk and take challenges						
	Creativity						
	Aesthetic wellbeing						
	Curiosity						
	Learning through variety of play						
	Social interactions with other children						
	Interactions with and attraction to nature						
	Wide variety of prolonged outdoor activity levels and activity types						
	Rich and varied sensorial experiences teaching body, spatial, temporal and directional awareness						
	(Able to influence the evolution of space)reference problem and understand how their actions can change their surroundings						

Purpose (Objective) To meet these goals, designers and educators should create play environments that provide:	Rich, complex space, experimental landscapes for learning,						
	Appropriate child to space density						
	Child's scale features and spaces						
	Real equipment and tools proportionate to the size of the child (age appropriate)						
	An integrated layout promoting easy flow between activities / multiple behavior settings						
	A variety of textures of both natural and manmade materials and surfaces						
	Natural and manmade loose parts						
	Sun and shade						
	Moveable features to encourage flexibility / Elements to manipulate						
	A variety of settings and sub-behavior settings / setting within settings / Diversity of places and habitats problem met reference						
	Big settings for physical activity						
	Enclosed spaces for imaginary activity						
	Spaces for loud and active behavior / they must be able to run freely						
	Spaces for quiet and restful behavior						
	Sensorial swings						
	Living things						
	Sensitive to climate						
	Risk and challenge with facilitator to support and guide the child in how to assess risk for themselves.						
	Child initiated, teacher supported play activities						

	Must include a facilitator of learning / pedagogue						
	Opportunity to freely chosen activity directed towards a goal / self-initiated inquiries, activities or play						
	Interaction with trees, bushes, and hedgerows, and a variety of non-toxic vegetation, including fruit bearing bushes, beautiful gardens.						
	Interaction with water, earth, sand. Transport water from one area to another						
	Novelty, diversity, dynamic and complex						
	Wind blowing, music chimes						
	Trees that filter light, provide climbing opportunities and that change during seasons and provide loose parts (leaves, bark etc.)						
	Grass, rocks						
	Sensory stimulation						
	Art outside Sensopathic play area/s						
	Water plants, searching, gathering, distinguishing plants with different scents, pick fruit, containers with children's own plants, a garden that is dear to them.						
	Use of bicycles, tricycles, go-carts and wheeled toys						
	Climbing opportunities						
	Wash-up area after messy activities before returning indoors						
	Provide materials for children to manipulate with their hands and fingers						

Create these Surroundings (Recommended Settings) The following behavior setting types can be used to meet the design objectives:	Open green space, grass						
	Different pathways of which some allow for the use of wheeled toys						
	Dramatic play settings						
	Water play area						
	Sand play area or digging pit						
	Earth play area or digging pit						
	Play structure areas						
	Animal / Wildlife area						
	Sensory garden						
	Vegetable, herb and fruit garden						
	Edge Habitat						
	Gathering spaces						
	Space for activities such as art						
	Climbable trees or structures						
	Swing area – both seated and by the arms						
	Varied topography such as mounds of grassed earth, slopes, and hills with climbers, different gradients, and stairs.						
	Woodwork area						
	Resting areas with seating						
	Outdoor basin and wash-up area						

Sources: Williams-Siegfredsen, 2012; Bennet, 2001; Feez, 2011; Pigott, 2012; Wellhousen, 2002; Wortham & Frost, 1990; Herrington, Lesmeister, Nicholls, & Stefiuk, n.d.; Esbensen, 1987 in Wortham & Frost, 1990; Titman, 1994 in Çorakçi, 2010; Frost, 1992 in Wellhousen, 2002 and Van Heerden, 2012

Table 4.2 School 1:Rubric for the design and use of an outdoor learning environment for whole child development

	Whole Child Development	Promotes whole child development on a scale of 0-5 0 being least and 5 being most					
		0	1	2	3	4	5
Aim (Goal) The goals of an outdoor play environment are to stimulate:	Physical activity					☺	
	Self-knowledge and self confidence				☺		
	Learning how to assess risk and take challenges			☺			
	Creativity				☺		
	Aesthetic wellbeing					☺	
	Curiosity			☺			
	Learning through variety of play				☺		
	Social interactions with other children					☺	
	Interactions with and attraction to nature				☺		
	Wide variety of prolonged outdoor activity levels and activity types				☺		
	Rich and varied sensorial experiences teaching body, spatial, temporal and directional awareness					☺	
	(Able to influence the evolution of space)reference problem and understand how their actions can change their surroundings				☺		

Purpose (Objective) To meet these goals, designers and educators should create play environments that provide:	Rich, complex space, experimental landscapes for learning,				☺		
	Appropriate child to space density				☺		
	Child's scale features and spaces					☺	
	Real equipment and tools proportionate to the size of the child (age appropriate)					☺	
	An integrated layout promoting easy flow between activities / multiple behavior settings					☺	
	A variety of textures of both natural and manmade materials and surfaces					☺	
	Natural and manmade loose parts				☺		
	Sun and shade						☺
	Moveable features to encourage flexibility / Elements to manipulate					☺	
	A variety of settings and sub-behavior settings / setting within settings / Diversity of places and habitats problem met reference				☺		
	Big settings for physical activity						☺
	Enclosed spaces for imaginary activity					☺	
	Spaces for loud and active behavior / they must be able to run freely				☺		
	Spaces for quiet and restful behavior					☺	
	Sensorial swings						☺
	Living things		☺				
	Sensitive to climate					☺	
	Risk and challenge with facilitator to support and guide the child in how to assess risk for themselves.				☺		
	Child initiated, teacher supported play activities					☺	

	Must include a facilitator of learning / pedagogue				☺		
	Opportunity to freely chosen activity directed towards a goal / self-initiated inquiries, activities or play				☺		
	Interaction with trees, bushes, and hedgerows, and a variety of non-toxic vegetation, including fruit bearing bushes, beautiful gardens.					☺	
	Interaction with water, earth, sand. Transport water from one area to another				☺		
	Novelty, diversity, dynamic and complex				☺		
	Wind blowing, music chimes		☺				
	Trees that filter light, provide climbing opportunities and that change during seasons and provide loose parts (leaves, bark etc.)					☺	
	Grass, rocks				☺		
	Sensory stimulation					☺	
	Art outside				☺		
	Water plants, searching, gathering, distinguishing plants with different scents, pick fruit, containers with children's own plants, a garden that is dear to them.					☺	
	Use of bicycles, tricycles, go-carts and wheeled toys					☺	
	Climbing opportunities						☺
	Wash-up area after messy activities before returning indoors					☺	
	Provide materials for children to manipulate with their hands and fingers					☺	

Create these Surroundings (Recommended Settings) The following behavior setting types can be used to meet the design objectives:	Open green space, grass				☺		
	Different pathways of which some allow for the use of wheeled toys					☺	
	Dramatic play settings					☺	
	Water play area				☺		
	Sand play area or digging pit					☺	
	Earth play area or digging pit	☺					
	Play structure areas						☺
	Animal / Wildlife area		☺				
	Sensory garden					☺	
	Vegetable, herb and fruit garden					☺	
	Edge Habitat				☺		
	Gathering spaces					☺	
	Space for activities such as art					☺	
	Climbable trees or structures					☺	
	Sensopathic areas					☺	
	Swing area – both seated and by the arms						☺
	Varied topography such as mounds of grassed earth, slopes, and hills with climbers, different gradients, and stairs.		☺				
	Woodwork area	☺					
	Resting areas with seating				☺		
	Outdoor basin and wash-up area					☺	

Table 4.4 School 2:Rubric for the design and use of an outdoor learning environment for whole child development

	Whole Child Development	Promotes whole child development on a scale of 0-5 0 being least and 5 being most					
		0	1	2	3	4	5
Aim (Goal) The goals of an outdoor play environment are to stimulate:	Physical activity					☺	
	Self-knowledge and self confidence				☺		
	Learning how to assess risk and take challenges				☺		
	Creativity				☺		
	Aesthetic wellbeing					☺	
	Curiosity				☺		
	Learning through variety of play					☺	
	Social interactions with other children					☺	
	Interactions with and attraction to nature				☺		
	Wide variety of prolonged outdoor activity levels and activity types					☺	
	Rich and varied sensorial experiences teaching body, spatial, temporal and directional awareness					☺	
	(Able to influence the evolution of space)reference problem and understand how their actions can change their surroundings					☺	

Purpose (Objective) To meet these goals, designers and educators should create play environments that provide:	Rich, complex space, experimental landscapes for learning,					☺	
	Appropriate child to space density						☺
	Child's scale features and spaces					☺	
	Real equipment and tools proportionate to the size of the child (age appropriate)					☺	
	An integrated layout promoting easy flow between activities / multiple behavior settings					☺	
	A variety of textures of both natural and manmade materials and surfaces					☺	
	Natural and manmade loose parts					☺	
	Sun and shade					☺	
	Moveable features to encourage flexibility / Elements to manipulate					☺	
	A variety of settings and sub-behavior settings / setting within settings / Diversity of places and habitats problem met reference				☺		
	Big settings for physical activity						☺
	Enclosed spaces for imaginary activity					☺	
	Spaces for loud and active behavior / they must be able to run freely						☺
	Spaces for quiet and restful behavior					☺	
	Sensorial swings					☺	
	Living things		☺				
	Sensitive to climate					☺	
	Risk and challenge with facilitator to support and guide the child in how to assess risk for themselves.				☺		
	Child initiated, teacher supported play activities					☺	

	Must include a facilitator of learning / pedagogue				☺		
	Opportunity to freely chosen activity directed towards a goal / self-initiated inquiries, activities or play				☺		
	Interaction with trees, bushes, and hedgerows, and a variety of non-toxic vegetation, including fruit bearing bushes, beautiful gardens.					☺	
	Interaction with water, earth, sand. Transport water from one area to another				☺		
	Novelty, diversity, dynamic and complex				☺		
	Wind blowing, music chimes	☺					
	Trees that filter light, provide climbing opportunities and that change during seasons and provide loose parts (leaves, bark etc.)					☺	
	Grass, rocks				☺		
	Sensory stimulation					☺	
	Art outside				☺		
	Water plants, searching, gathering, distinguishing plants with different scents, pick fruit, containers with children's own plants, a garden that is dear to them.				☺		
	Use of bicycles, tricycles, go-carts and wheeled toys					☺	
	Climbing opportunities					☺	
	Wash-up area after messy activities before returning indoors					☺	
	Provide materials for children to manipulate with their hands and fingers					☺	

Create these Surroundings (Recommended Settings) The following behavior setting types can be used to meet the design objectives:	Open green space, grass						☺
	Different pathways of which some allow for the use of wheeled toys					☺	
	Dramatic play settings					☺	
	Water play area				☺		
	Sand play area or digging pit						☺
	Earth play area or digging pit		☺				
	Play structure areas						☺
	Animal / Wildlife area		☺				
	Sensory garden					☺	
	Vegetable, herb and fruit garden	☺					
	Edge Habitat				☺		
	Gathering spaces					☺	
	Space for activities such as art				☺		
	Climbable trees or structures					☺	
	Sensopathic areas					☺	
	Swing area – both seated and by the arms					☺	
	Varied topography such as mounds of grassed earth, slopes, and hills with climbers, different gradients, and stairs.		☺				
	Woodwork area	☺					
	Resting areas with seating					☺	
	Outdoor basin and wash-up area					☺	

Table 4.6 School 3 -Rubric for the design and use of an outdoor learning environment for whole child development

	Whole Child Development	Promotes whole child development on a scale of 0-5 0 being least and 5 being most					
		0	1	2	3	4	5
Aim (Goal) The goals of an outdoor play environment are to stimulate:	Physical activity					☺	
	Self-knowledge and self confidence				☺		
	Learning how to assess risk and take challenges				☺		
	Creativity				☺		
	Aesthetic wellbeing					☺	
	Curiosity				☺		
	Learning through variety of play					☺	
	Social interactions with other children					☺	
	Interactions with and attraction to nature				☺		
	Wide variety of prolonged outdoor activity levels and activity types				☺		
	Rich and varied sensorial experiences teaching body, spatial, temporal and directional awareness				☺		
	(Able to influence the evolution of space)reference problem and understand how their actions can change their surroundings					☺	

Purpose (Objective) To meet these goals, designers and educators should create play environments that provide:	Rich, complex space, experimental landscapes for learning,				☺		
	Appropriate child to space density					☺	
	Child's scale features and spaces					☺	
	Real equipment and tools proportionate to the size of the child (age appropriate)					☺	
	An integrated layout promoting easy flow between activities / multiple behavior settings					☺	
	A variety of textures of both natural and manmade materials and surfaces					☺	
	Natural and manmade loose parts				☺		
	Sun and shade					☺	
	Moveable features to encourage flexibility / Elements to manipulate					☺	
	A variety of settings and sub-behavior settings / setting within settings / Diversity of places and habitats problem met reference				☺		
	Big settings for physical activity						☺
	Enclosed spaces for imaginary activity				☺		
	Spaces for loud and active behavior / they must be able to run freely					☺	
	Spaces for quiet and restful behavior					☺	
	Sensorial swings				☺		
	Living things		☺				
	Sensitive to climate				☺		
	Risk and challenge with facilitator to support and guide the child in how to assess risk for themselves.				☺		
	Child initiated, teacher supported play activities					☺	

	Must include a facilitator of learning / pedagogue				☺		
	Opportunity to freely chosen activity directed towards a goal / self-initiated inquiries, activities or play				☺		
	Interaction with trees, bushes, and hedgerows, and a variety of non-toxic vegetation, including fruit bearing bushes, beautiful gardens.					☺	
	Interaction with water, earth, sand. Transport water from one area to another					☺	
	Novelty, diversity, dynamic and complex				☺		
	Wind blowing, music chimes	☺					
	Trees that filter light, provide climbing opportunities and that change during seasons and provide loose parts (leaves, bark etc.)			☺			
	Grass, rocks				☺		
	Sensory stimulation					☺	
	Art outside				☺		
	Water plants, searching, gathering, distinguishing plants with different scents, pick fruit, containers with children's own plants, a garden that is dear to them.				☺		
	Use of bicycles, tricycles, go-carts and wheeled toys					☺	
	Climbing opportunities					☺	
	Wash-up area after messy activities before returning indoors			☺			
	Provide materials for children to manipulate with their hands and fingers					☺	

Create these Surroundings (Recommended Settings) The following behavior setting types can be used to meet the design objectives:	Open green space, grass					☺	
	Different pathways of which some allow for the use of wheeled toys				☺		
	Dramatic play settings				☺		
	Water play area					☺	
	Sand play area or digging pit					☺	
	Earth play area or digging pit				☺		
	Play structure areas					☺	
	Animal / Wildlife area		☺				
	Sensory garden					☺	
	Vegetable, herb and fruit garden					☺	
	Edge Habitat				☺		
	Gathering spaces				☺		
	Space for activities such as art				☺		
	Climbable trees or structures					☺	
	Sensopathic areas					☺	
	Swing area – both seated and by the arms				☺		
	Varied topography such as mounds of grassed earth, slopes, and hills with climbers, different gradients, and stairs.				☺		
	Woodwork area	☺					
	Resting areas with seating					☺	
	Outdoor basin and wash-up area			☺			

Table of gross motor and fine motor skills as found in De Witt and Booysen (1995:90.91).

Age	Gross motor skills	Fine motor skills
3 years	Jumps with both feet together from one step. Stands on one leg for about 6 seconds Comes erect from a kneeling position without using his hands Can cross both his arms and legs when sitting Can tiptoe Walks up the stairs one foot at a time Can walk on a straight line 2cm wide can walk short distances on a beam 10cm wide Throws a ball without losing his balance Gallops, jumps and walks in time to music	Draws a horizontal line from an example Builds a tower with ten blocks, begins to build patterns and bridges Handles a pair of scissors and tries to cut with them Draws a circle (in a primitive fashion) Can copy a cross Can hold thick pencils or crayons with his thumb and forefinger Scribbles and can fold paper Washes own hands and face Can dress a doll Can fasten big buttons Sets the table, makes the bed and puts away clothes which are lying around.
4 years	Can run fast Can ride a tricycle Marches in time with music Walks along a white line one meter long Can hop, skip and jump on one leg Jumps from two steps Legs are now controlled away from each other or from the rest of the body Very active Runs up and down stairs Enjoys balancing activities Climbs trees, nets, ladders and jungle gyms Can carry a container filled with liquid without spilling Throws a ball from shoulder height Can walk on a 2.5 cm wide circular line	Folds a square piece of paper in half from an example Can thread twelve beads Can cut a piece of paper in half Can fold a piece of paper in quarters Can copy a drawing of a ladder Draws a recognizable man Paints freely Enjoys big blocks, boxes and planks and can build more complex constructions Models with dough and clay Uses a hammer and saw
5 years	Can kick a ball while running Catches a ball fairly well	Can copy a cross Can copy a circle (a good shape)

	Nimble and energetic, enjoys quick-moving toys and games Can touch toes with legs straight Has more control of physical activities Begins to master different skills with ease Can dress and undress himself Control of large muscles better than fine muscles Enjoys climbing up fences Uses alternative feet when climbing steps	Copies a square Can now handle a pencil Fine muscle co-ordination becomes more refined Draws people, houses, airplanes and vehicles that are recognizable Cuts out big pictures with ease Uses hands more than arms in the action of catching
6 years	Can jump with both feet over a rope 6cm high Very adventurous Tumbles, skips, runs and is dexterous on the jungle gym Can climb unaided onto a bus Can run upstairs	Copies a window Draws a house Can tear a piece of paper neatly along the edge
7 years	Active and energetic All physical activities are popular Walk along a narrow plank, balances on poles, uses rackets and balls skillfully Dances with pleasure	Fine motor co-ordination is well developed Begins to learn the new skills of writing

Table on theories of periods of cognitive development of the young child.

Theorist	Theory on development	At ages:
Fröbel	Phases in progression (Verster, 1992:142)	0-1 year *(being a baby)* 1-3 years *(early infancy)* 3-7 years *(infancy)* 7 + years *(youth and adulthood)*
Vygotsky	Critical periods during which rapid changes takes place in the child. (Charlesworth, 2008)	0-1 year 3 years 7 years
Epstein	Different stages of accelerated brain growth (De Witt & Booysen, 1995:81)	0-2 years 2-4 years 6-8 years
Piaget	Four periods of human cognitive development (De Witt & Booysen, 1995:13)	0-2 years *(Sensori-motor period)* 2-7 years *(Pre-operational period)* 7-11 years *(Concrete operational period)* 11 + years *(Formal operational period)*

General observation notes of the case studies

1. General observation notes of school 1

The following are observation notes as I made them at each Pre-school during the observation of the children playing outside. These observations notes were made for the purpose of enriching the data collected.

- Notes on children interacting with the environment:

Children enjoyed looking for natural loose parts. The playground does not lend itself to unrestrained running as it is quite densely populated with play equipment and children were not really observed running freely.

- Notes on teacher child interaction:

Mostly supervision. Staff on different points watching kids. Very little interaction except if children come to them. Risky play not allowed by staff. The staff cut down the low branches that the children picked the berries from because they saw it as a falling hazard for the children taking away this somewhat risky activity that contributed much to both motor and sensory stimulation.

- Notes on the playground itself.

The playground is quite densely populated with equipment. It is also mostly in shaded areas of big trees and shade nets. The playground surface is mostly rubberized.

2. General observation notes of school 2

The following are observation notes as I made them at each pre-school during the observation of the children playing outside. These observations notes were made for the purpose of enriching the data collected.

- Notes on children interacting with the environment:

The playground is quite open and it was quite easy to see where new activity was forming and where prolonged activity was taking place

- Notes on teacher child interaction:

The rules that the teachers have about play inhibit risky play although the structures encourage it to a certain extent.

- Notes on the playground itself.

The playground has ample space to run freely and children engaged in vigorous running games. They seemed to enjoy the freedom to run across the playground from one end to the other.

3. General observation notes of school 3

Following are the observation notes as I made them at school 3 during the observation of the children playing outside. These observations notes were made for the purpose of enriching the data collected.

- Notes on children interacting with the environment:

All areas of the main playground was used throughout play time. The Grade R playground had some areas that were not utilized on the days that I observed, but the teacher commented that these areas are used. Risky play is not really encouraged. The richness of the playground is in the novelty and variety of loose parts that are exchanged every week. (There is an attic storeroom filled with different apparatus.) The open space gives ample opportunity for unrestrained running and riding bicycles, although the running was not as vigorous as at school 2 (possibly because the outdoor playground is smaller). The loose parts that fall from the sensory table as well as the sand from the sand pit create a wonderful opportunity when at tidy-up time the children sweep it up and return it to the sandpit or sensory tables. On the main playground, several classes play together

including the Grade R children, but on the Grade R playground only the Grade R children play.

- Notes on teacher child interaction:

Mostly supervision. Staff on watching kids from a two central points. Very little interaction except if children come to them, more just free play.

- Notes on the playground itself.
  Only one (3 piece) tree on playground but area where school is situated is a green leafy area and the surrounding vegetation in the surrounding yards create a green surrounding for the playground with many trees, ivy's and bushes.