CHAPTER 3. LEARNING THEORIES: THE YOUNG CHILD AND ROAD SAFETY EDUCATION

3.1 Introduction

In Chapter 3, I expand the literature review with the focus on possible theories related to the young child, possible learning theories and RSE. This study focuses on children in the Intermediate Phase who are between the ages of 9 and 14 years. In this age range children in South Africa have been introduced to RSE in the formal setting of the school since Grade 1. These theories will provide an understanding of how children acquire and internalise their attitudes and behaviour towards RSE. The chapter is therefore an extension of the theoretical framework described in Chapter 2. In addition, I comment on factors that might influence the learning of road safety skills in this chapter.

The central focus of the chapter is the description of theories applicable to children learning road safety skills. These theories relate to the focus of the study, namely investigating the response of children to RSE with special reference to a rural environment which is characterised by a lack of resources and poverty. This background served as the basis for developing an observation schedule and other research tools to be used in the data gathering process. The information in this chapter also served as a framework for suggesting a teaching or facilitation approach that could be appropriate for the teaching of road safety to young children who are still in the process of maturation.

The study is informed by the assumption that the child is a totality of all his or her experiences. The various theories discussed in this chapter serve as a mind map or point of reference for appreciating the various processes and stages of the development of the child and how these stages impact on their development and learning capacities (Biehler, 1974, p. 105; Bergan & Dunn, 1970, pp. 15-16; Mayer, 1987, p. 18-44). The development theories assisted me in suggesting an instructional theory for road safety.

3.2   Profile of the target group participating in the investigation

The target group for this study is children from a rural primary school in the Moloto area along the R573 road, 40 kilometres east of Pretoria, in Mpumalanga. The area has been chosen as the school is close to the busy road which exposes the children to danger when going to school in the morning and returning home in the afternoons. The children are mostly from working class families. Most parents commute daily to Pretoria, where they work. The children are then left on their own to negotiate the roads to and from school. The home environment does not offer the children an opportunity to acquire basic road safety skills before they start their schooling. Most families do not have family cars. The mode of travel is mostly by bus (National Household Travel Survey, 2003; Museru *et al.*, 2003; Van Vuuren, n.d.; Downing *et al.,* 1991). Ndungane (2006, p.8), former Archbishop of Cape Town, refers to the children from such communities as "the most needy sector of our population – a sector that has so little voice within the political and decision-making structures of our country" (Monson, Hall, Smith & Shung-King, 2006).

The National Household Travel Survey (2003, p. 19) indicates that in South Africa the vast majority, 76%, of children and students walk to their educational destinations. Almost three million of the children spend more than one hour a day walking to and from the education centres. An analysis of the walking times for pedestrians (including children) per province is given in Table 3.1.

Table 3.1   Walking time for pedestrians to educational centres and the number of people walking to these centres, by province

Province	Number walking	Percentage of walking trips				
		1 – 5 minutes	16 – 30 minutes	31 – 45 minutes	46 – 60 minutes	>60 minutes
Western Cape	759 000	62,8	30,6	3,6	3,7	2,1
Eastern Cape	2 226 000	39,8	33,6	10,5	10,9	5,2

Province	Number walking	Percentage of walking trips				
		1 – 5 minutes	16 – 30 minutes	31 – 45 minutes	46 – 60 minutes	>60 minutes
Northern Cape	182 000	49,6	38,7	9,3	2,0	0,4
Free State	736 000	49,7	33,3	7,7	5,6	3,7
KwaZulu-Natal	2 731 000	23,7	36,4	16,8	13,9	9,2
North West	996 000	36,3	38,3	12,1	8,6	4,7
Gauteng	1 305 000	41,6	40,3	10,8	5,4	1,9
Mpumalanga	973 000	37,6	36,8	11,8	8,8	5,0
Limpopo	2 045 000	43,1	37,7	9,3	7,3	2,6

Source: National Household Travel Survey, 2003

The implication for road safety is that these children that walk to school on their own are exposed to the dangers of crossing busy roads by themselves while their parents are at work. Parents in these rural communities do not accompany their children to school even if they are at home. An article titled "Boy, 16, killed in 'high-speed' bus crash" (Shonisani, 2004) illustrates the point clearly:

> *A speeding bus ploughed into a group of school children in Atteridgeville west of Pretoria yesterday, leaving a 16-year-old boy dead and two others seriously injured.*
>
> *The children had been waiting to be taken to school at 8 am, when they allegedly saw the bus moving at high speed towards them.*

Table 3.2 shows walking times to educational centres by type of establishment. Some 25% of primary school children who walk to school (1,7 million) walk for longer than 30 minutes in one direction. Considering all children who walk to school, there are 560 000 who spend more than two hours per day walking to and from school. The purpose of the data is to illustrate the level of exposure for children to roads as pedestrians.

Mpumalanga has the second smallest share of the South African population according to Statistics South Africa (2004, p. 30), with 7% of the total population residing in this province. Of this population, 973 000 are children who walk to school – thus a large number. The relevancy of this information is that such a large number of children are daily exposed to the danger of being knocked down by vehicles on their way to school, as can be seen in Table 3.2 (see also Chiduo & Minja, n.d.).

Table 3.2   Walking time to educational centres, by type of establishment

Establishment type	Number walking	Percentage of walking trips				
		1 – 15 minutes	16 – 30 minutes	31 – 45 minutes	46 – 60 minutes	>60 minutes
Pre-school	1 018 000	55,6	34,6	4,2	4,3	1,2
Prim. school	6 912 000	39,0	36,5	11,4	9,0	4,1
High school	3 824 000	33,5	36,0	13,2	10,2	7,1
Post-matric	103 000	29,1	41,6	17,7	9,0	2,4
Other	88 000	53,6	32,0	5,1	7,1	2,2
Total	1 1945 00	38,7	36,2	11,4	9,0	4,8

Source: National Household Travel Survey, 2003

In a situation where the level of RSE is low, such a high level of exposure could be very dangerous for children. This therefore makes out an even more compelling case for RSE to be understood and prioritised in the South African context. The growing economy is bringing a new dimension into this scenario as more people are buying cars, which means there are more drivers on the roads.

3.3   Child development and the learning of road safety

Children's development has a bearing on their uptake of educational programmes (Quimby, n.d.; Van Vuuren, n.d.; Fontaine *et al.,* 2006; McInerney, 2005; Piaget, 1973; Mayer, 1987; Slavin, 2000, p. 29). Munro (1969, p. 92) sees development as a

continuous series of adjustments between changing self and changing environment which of course does not stop abruptly when bodily growth stops. Adults, like children, are constantly altering in order to achieve satisfaction of needs in accordance to the present level of development (Slavin, 2000, p. 28).

The UK Department for Transport (2006) indicates that a child's development in the field of road safety must include two levels, i.e. the cognitive and the metacognitive. The argument is that the intellectual development of the child will lead to behavioural development. To internalise the road safety educational messages, the child should have reached a particular development level both cognitively and socially (Eloff *et al.,* 2006; Chunk, 2000; Hansen & Zambo, 2005). Piaget (in Rosin, 1973, p. 50-51) argues that the stages of intellectual development do not necessarily follow a chronological order but are informed by the previous experiences of the child or individual. It also depends on the social milieu which could hasten or delay the manifestation of a certain stage of development (Slavin, 1994; Glover & Bruning, 1990; Schwebel & Raph, 1973).

RSE in the developed world is offered as a compulsory part of the mainstream curriculum. As indicated in the literature review in Chapter 2, in these countries children's deaths as a result of road accidents have been reduced dramatically (Collins, 2006; Petersen, 2006; The Road Ahead, 2006; The Danish Road Safety Commission, 2000; Mohan & Tiwari, 1998). Studies show that the overall purpose of RSE is to teach children safe road behaviour in order for them to become safe road users either as pedestrians or as young adult drivers (Department for Transport, 2006, p. 1; Wittink, 1998).

With the advent of outcomes-based education (OBE) and the introduction of the National Curriculum Statement in South Africa, RSE became part of the mainstream curriculum (Mock *et al.,* 2005; Van Vuuren, n.d.; Kobusingye, 2004; Sayer & Downing, 1996, p. 8-9). An evaluation of the South African road safety campaign, *Arrive Alive*, shows that although people are regularly exposed to RSE messages they do not necessarily translate that knowledge into safe road user behaviour (Road Traffic Management Corporation, 2005). The challenge is therefore to look at ways that RSE within the mainstream curriculum can influence children to learn and internalise safe

ways of using roads. In the context of the South African situation the problem is exacerbated by the unplanned informal settlements developing along the major routes, especially in the rural areas.

The World Report on Child Injury Prevention (2008) indicates that as children grow and their world extends beyond the home and out into the local roads their level of exposure to danger, hazards and risks increases. In rural settings children play or live on the roadside and this exposure along with other risk factors inherent to childhood such as lack of knowledge and poor perception of speed, make them particularly vulnerable in traffic. Table 3.3 illustrates the stages of cognitive and psychosocial development described by Piaget and Erikson (in Biehler & Snowman, 1997; Eggen & Kauchak, 2001, p. 92; Mayer, 1987, p. 23).

3.4   Children's developmental phases

Young children were the focus of this case study. I therefore give some defining characteristics of the developmental phases of children as described in the literature. This information will assist my understanding of the children's response to RSE. I discuss these under the following phases: cognitive, social and emotional. I then relate these phases to the young child in the Intermediate Phase (see 3.4.4-3.4.6). Ausubel and Sullivan (in Bergan & Dunn 1970, p. 16) define development as change that occurs as a result of time. In their view development presupposes that some degree of lawful continuity prevails between successive stages of an ongoing growth process and that the properties of prior phases contribute in part to the form and substance of subsequent phases. This understanding of development is informed by the acknowledgement that both the hereditary and environmental factors are interactive contributors to development. The concepts of nature and nurture are used by developmentalists to refer to the complementary role that nature and nurture play in the process of development. Nature refers to the influence of genetic factors on development and nurture refers to the influence of the environmental factors (ibid. 18).

3.4.1 Cognitive development

Between the ages of five and seven, children's thought processes change significantly (Slain, 2001, p. 84). This is a phase of transition from the stage of preoperational thought to the stage of concrete operations. In this stage, the child is able to do things mentally rather than physically. Not all children make this transition at the same age. When a child moves to the next stage the characteristics of the previous stage are maintained and the characteristics of the next stage build on those of the previous stage (Mayer, 1987, pp. 25-27). At around the age of 11 years the child moves from the concrete to the formal operations. This is the stage of hypothetical-deductive thought. This stage is characterised by the child's ability to deal logically with the possible as well as with the actual, namely with hypothetical as well as real situations (Slain, 2001; Mayer, 1987, pp. 33-34). The implication for learning is that teachers should arrange their learning programmes in such a way that they consider the child's level of development. Because not all children develop at the same pace, those who have not yet reached a particular stage of development should be catered for in the learning programme.

3.4.2 Social development

According to Eggen and Kauchak (2001, p. 85), social development describes the advances young people make in their ability to interact and get along with other people. People are social beings and classrooms are social places that require children and teachers working together cooperatively. Once teachers understand how social development works, they will be in a better position to guide the child towards becoming a better social being (ibid.). As children develop socially they will be able to work with other children and benefit from peer education and gain more from the learning programme. They will also appreciate their particular group of friends. Two characteristics influence effective interpersonal relations, namely perspective taking and social problem solving.

Perspective taking is the ability to think about and understand the thoughts and feelings of others. It is a stage that develops slowly and is likened to Piaget's stages of cognitive

development. This stage is critical because it enables children to work with other children. Children who have mastered this stage display more empathy and compassion. Children who are poor at perspective taking are quarrelsome and resort to arguing and fighting. They display antisocial behaviour and mistrust other children.

Social problem solving, on the other hand, refers to the ability to resolve conflicts in a way that are beneficial both to oneself and others. It is a stage characterised by the following phases:

- Observing and interpreting social cues;

- Identifying social goals;

- Generating strategies.

This stage, like the perspective taking stage, develops gradually (Eggen & Kauchak, 2001, p. 86). In the teaching of road safety skills it means that the teacher has to understand the personality of the children in order to understand and assess their learning capabilities. Teachers must understand the social groups in their classes so that they can group children who belong to the same group to facilitate the learning of the road safety skills they are teaching. Because children are social beings, they learn from each other. This knowledge is invaluable in teaching skills that depend to a large extent on the practical aspects of real road situations.

3.4.3 Emotional development

During the elementary grades, between the ages of five and 14 years, children develop a global and moderately stable self-image. At this age they develop a mental self-portrait of themselves which is characterised by a description of their physical, social, emotional and cognitive attributes, referred to as self-concept; and the evaluative judgements they make about those attributes is called self-esteem. Children compare themselves with others. The self is described in terms of emotions and how well they can be controlled.

Rejection and disruptive family relationships may lead to poor performance at school (Seaman & Biehler, 1997, p. 97). Parents of such children administer harsh and

inconsistent punishment. The affected children are rejected by their peers and become distracted when doing their school work. They show very little interest in what they do. For teachers, academic self-concept – the component of general self-concept that deals with students' perception of their competence as children – is most important (Eggen & Kauchak, 2001, p. 100).

The implication for teachers is that teachers who teach road safety skills should understand and address the motivational development of their children so that children who are emotionally disturbed may be helped. I argue that there should be a working relationship between all role players in the teaching of road safety skills, particularly between parents and teachers, so that teachers could have an understanding of the factors that might be create an emotional imbalance in children. As the literature shows, children who are emotionally disturbed perform poorly in class and get distracted from their work. Learning road safety skills requires that the children should be attentive all the time as one mistake could cost them their lives.

During the interviews with children and parents I realised that most of the children were from single-parent families. Although this was not the focus of the study, it came to my attention that most children were staying with their mothers, with no fathers in the family. As this was an emotional subject I did not ask either the mothers I interviewed or the children from these single-parent families about their relationship with their fathers or the fathers of the children. Teachers who teach road safety skills in these settings should consider this factor before being judgemental about children's learning or slow uptake of road safety skills. Nevertheless, the absence of either parent did not seem to affect the self-esteem of the children. I observed during the interviews that the children were cheerful and eager to learn, an aspect that I conclude boded well for the learning of road safety skills.

Table 3.3   Stages of cognitive and psychosocial development described by Piaget and Erikson

Piaget's stages of cognitive development			Erikson's stages of psychosocial development		
Stage	**Age range**	**Characteristics**	**Stage**	**Age range**	**Characteristics**
Preoperational	2 – 7 yrs	Develops schemes primarily through sense and motor activities. Recognises permanence of objects not seen.	Initiative vs. guilt	4 – 5 yrs	Ability to participate in many physical activities and to use language to set initiatives. If not appreciated they feel guilt.
Concrete operational	7 – 11 yrs	Gradually acquires ability to conserve and decentre but not capable of operations and unable to mentally reverse actions.	Industry vs. inferiority	6 – 11 yrs Elementary to middle school	Behaviour dominated by curiosity and performance. Develops a sense of industry. If his efforts are unsuccessful or he is derided inferiority sets in.
Formal	11– Adulthood	Able to deal with abstractions, form hypotheses, solve problems systematically, engage in mental manipulations.		12 – 18 yrs Middle through high school	Develops meaningful identity and roles and skills that prepare them for adulthood. If this fails it results in role confusion.

Sources: Biehler & Snowman, 1997; Eggen & Kauchak, 2001, p. 92; Mayer, 1987, p. 23

3.4.4 The cognitive development of children in the Intermediate Phase (9-14 yrs)

At the intermediary stage as described by the National Curriculum (2002) as the Intermediate Phase the primary school child aged between nine and 14 years is able to think logically, although such thinking is constrained, unstructured and insistent (Biehler & Snowman, 1997). According to Piaget's stages of development, children in the 9-14-year age range are concrete, operational-stage thinkers. Most children will have attained enough mastery of logical schemes that they can understand and solve tasks like reading maps as long as the tasks refer to tangible ideas that the child has experienced or can imagine. Their knowledge base is still elementary and contains a lot of misconceptions which may lead to illogical behaviour.

During this stage differences in cognitive style become apparent. According to Biehler and Snowman (1997, p. 98) cognitive styles are tendencies or preferences to respond to a variety of intellectual tasks and problems in a particular fashion. Some children might be impulsive while others are more reflective (Slavin, 1994, p. 70-76). The perception and thinking patterns of the children are influenced by the surrounding context. Helping teachers to become aware of different cognitive styles will help them understand and appreciate the need for using different teaching methods and approaches so that all children benefit from the learning and teaching process.

3.4.5 The emotional development characteristics of children in the Intermediate Phase

During the Intermediate Phase, children develop a global and moderately stable self-image (Biehler & Snowman, 1997; Slavin, 1994; Mayer, 1987). Children have made an extensive study of their self-image at this stage. A mental picture or self-portrait of themselves is made up of a number of components, i.e. a description of their physical, social, emotional and cognitive attributes which is referred to as self-image. Children start to compare themselves with others. The child's sense of self is influenced by the information and attitudes communicated by parents, teachers and friends. They are at a stage when they are impressionable (Eggen & Kauchak, 2001, p. 99). Self-esteem and self-worth, according to Eggen and Kauchak (2001, p. 99) refer to the affective or

emotional reaction to the self. Self-esteem is important because children with high self-esteem are confident, curious, independent and motivated and do well in school (ibid.).

If the home environment remains stable the child's self-image will remain stable. Disruptive family relationships, social rejection and school failure may lead to delinquent behaviour. Delinquents have few friends and are easily distracted and not interested in schoolwork, and by and large lack basic skills (Biehler & Snowman, 1997).

3.4.6 The social developmental of children in the Intermediate Phase

People are social beings and classrooms are social places that require students and teachers to work together cooperatively. Eggen and Kauchak (2001, p. 85) describe social development as the advances children make in their ability to interact and get along with other people. At this social developmental level of the child, the peer group becomes powerful and begins to replace adults as the major source of behaviour standards and recognition of achievement (Biehler & Snowman, 1997; Eggen & Kauchak, 2001, pp. 80-85). Children are drifting away from the influence of parents and are beginning to influence each other as children. The downside of this is that children in this phase realise that the rules of peer groups are different from the rules of parents. In order to be accepted by the peer group, they do not oppose group rules and norms, and they end up engaging in unbecoming behaviour. Friendships become more selective and gender-based. These relationships are based on common ideas, outlooks and impressions of the world (Eggen & Kauchak, 2001).

An understanding of the social development of this age group is important because an increased understanding helps us guide the children in their attempts to become effective social beings. As children's social skills advance, their abilities to work effectively in groups improve, improving both how much they learn and their satisfaction with the learning situations (Eggen & Kauchak, 2001, p. 85).

3.5   Content of road safety education in schools at the Intermediate Phase

The RSE Programme of the Road Traffic Management Corporation (RTMC), the Department of Transport's agency tasked with the implementation of road safety

programmes, is currently being implemented in schools. The programme outlines the learning outcomes (LO) and assessment standards (AS) of learning areas that have to be taught to children. In the Intermediate Phase the LOs and ASs which are relevant to RSE are outlined in Table 3.4.

Table 3.4   Learning outcomes and assessment standards linked to Road Safety Education

Topic: Safety near roads

Links to the National Curriculum (Department of Education 2002)

Learning area	Assessment standards: The child will be able to ….
Life Orientation LO 1: Health promotion – The child is able to make informed decisions regarding personal, community and environmental health.	Life Orientation Grade 4: Lists and explains traffic rules relevant to road users.
LO 3: Personal development – The child will be able to use acquired life skills to achieve and extend personal potential to respond effectively to challenge in his or her world.	Grade 4: Considers and interprets the emotions of others.
LO 2: Social development – The child will be able to demonstrate an understanding of and commitment to constitutional rights and responsibilities, and to show an under-standing of diverse cultures and religions.	Grade 5: Applies children's rights and responsibilities to a range of problem situations (right to safety).
Language: Home language 3: Reading and viewing – the child will be able to read and view for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in texts.	Grade 6: Reads for information: follows instructions, recipes, maps and plans.

Source: Road Traffic Management Corporation RTMC, 2006

The training manual for children predating the national curriculum and OBE emphasises that any training of children on road safety should consider the developmental level of the child. The manual was developed by the National Road Safety Council, the predecessor of the RTMC.

The manual has two broad aims which tally with the purpose of the new curriculum, viz. to develop children who will be able to understand their role in society and be responsible for their safety. The aims of the manual are:

- Short-term: to make the child aware of problems relating to pedestrians and vehicular traffic.

- Long-term: to contribute to the development of the child as a whole. It therefore encompasses not only a method aimed at ensuring the immediate safety (of the child), but also in fact paves the way to responsible adulthood (NRSC, 1985).

The programmes that are followed in South Africa are based on the Social Learning Theory (NRSC, 1985). The children must simulate good road use behaviour in a simulated road environment with teachers as models and mentors. Modelling is key in this approach (NRSC, 1985). The challenge for the rural school as indicated in Chapters 1 and 2 of this study is that rural schools do not have Junior Traffic Training Centres (JTTC) in their vicinity; neither do they and they have the portable centre which could be built in the class. The second element of the programmes is that they aim to encourage the child to discover his environment on his own and construct the reality that the environment presents. The child is taught to negotiate his way to school safely.

In the context of this chapter, both the present RSE programmes and the previous programmes compiled by the National Road Safety Council, emphasise the importance of grading teaching programmes in order to accommodate the developmental stages of children. The layout of the JTTC must be adapted according to the specific age groups that will use the centre. In this way children will benefit optimally from the road safety inputs (NRSC, 1985; Child and Traffic, 1980; Children and Roads: A safer way, 1990).

3.6 Theories of child development and their relevance for the learning of road safety

Child development refers to the physical, intellectual, social, and emotional changes that occur from birth to adolescence. Although people change throughout their lives, developmental changes are especially dramatic in childhood (Child Development, 2009;

Cole, 2004; Slavin, 1994; Mayer, 1987). During this period of development the child grows into a capable young person who has mastered language, is self-aware, can think and reason with sophistication, has a distinctive personality, and socialises effortlessly with others (Child Development, 2009; Slavin, 1994; Mayer, 1987, pp. 19-22). Many abilities and characteristics developed during childhood determine how one learns skills like road safety. Many road safety programmes like the behavioural programmes implemented in the Netherlands and the United Kingdom are based on the principles of Social Learning Theory, which emphasises the acquisition of new behaviours via the imitation of actions modelled by others. These learning theories are based on the developmental theories. The purpose of this chapter is to discuss some aspects of the major theories of child development and the learning theories to see what light they can shed on the learning of RSE (Thomson, Tolmie, Foot & McLaren, 1996; Child and Traffic, 1990; Department of Transport, 1990).

The literature indicates several theories of child development, learning and teaching relevant to RSE (Schunk, 2001; Thomson *et al.*, 1996; De Cos, 1997). For the purpose of this study four theories of development are discussed to illustrate the possible relevance for RSE and the 9-14-year-old child. The four theories are: maturationist, behaviourist, constructivist and the social development perspectives of development (Powell, 1991; Woolf, 1998). When discussing each theory I shall elaborate on the possible application of the theory to this study.

3.6.1 Maturationist theory

The maturationist theory was advanced by the work of Gesell (Child Development, 2009; Theories of Child Development and learning, n.d.). Maturationists believe that development is a biological process that occurs automatically in predictable, sequential stages over time (Hunt, 1969). Gesell was among the first to implement a quantitative study of human development from birth through adolescence, focusing his research on the extensive study of a small number of children. He began with pre-school children and later extended his work to ages five to 10 and 10 to 16. From his findings, Gesell concluded that mental and physical development in infants, children, and adolescents are comparable and parallel orderly processes (Bates, 1989).

Gesell was guided by a maturational conception of development. "Growth", he said, "is a process so intricate and so sensitive that there must be powerful stabilising factors, intrinsic rather than extrinsic, which preserve the balance of the total pattern and the direction of the growth trend. Maturation is a name for this regulatory mechanism" (Bates, 1989). As for the influence of exogenous factors (e.g. environment) on development, Gesell commented that they "may play a screening or selective role determining which of competing potencies are to be realised ... but the basic mechanism of realisation is one of maturation..." (Bates, 1989).

As a psychologist, Gesell realised the vast importance of both nature and nurture. He cautioned others not to be quick to attribute mental disabilities to specific causes. He believed that many aspects of human behaviour, such as handedness and temperament, were heritable. He understood that children adapted to their parents as well as to one another (Developmental Norms, n.d.).

Development, according to Gesell, followed what he called developmental norms. Developmental norms are defined as standards by which the progress of a child's development can be measured. For example, the average age at which a child walks, learns to talk, or reaches puberty would be such a standard and would be used to judge whether the child is progressing normally (Developmental Norms, n.d.).

This perspective leads many educators and families to assume that young children will acquire knowledge naturally and automatically as they grow physically and become older, provided that they are healthy, without any purposeful intervention (Demarest *et al.,* 1993). The thinking here is that maturity is inborn and it happens according to a sequential pattern (Munro, 1969, p. 98).

The responsibility for learning lies with the parents and as long as the child is healthy he or she will be able to master the set competencies. However, Gesell's conclusion is that a child learns whether or not an adult teaches him or her. He suggests that adult intervention is not necessary for a child to learn as the learning process and physical development are pre-programmed.

In the dualism of heredity and environment Gesell believed that heredity is key to achieving the performance of tasks. He remained doubtful whether the basic qualities of infants can be measurably altered by environmental influences, for Gesell believed that a child, even when not trained, would be able to perform a task because nature prepared them that way. He saw a very limited role for the environment.

This theory is not precisely relevant for RSE where many purposeful interventions are necessary to prepare the child for the world beyond the classroom as already described in this study. For instance in the case of road safety a purposeful intervention has to take place in the school and home environment to ensure the survival of the child not only in his community but in other settings as well. It is my understanding, derived from experience, that it would be irresponsible to release children into a dangerous environment such as busy roads without preparing them for it.

In terms of road safety I understand that learning occurs (observational learning theory) by observing other people acquire knowledge, rules, skills (road safety skills), strategies, beliefs, (speed kills), and attitudes. RSE is about attitudes and behaviour modification. Schunk (2000, p. 78) states that individuals also learn from modelling about the usefulness and appropriateness of behaviours and the consequences of modelled behaviour, and they act in accordance with beliefs about their capabilities and the expected outcomes of their actions.

The review of the literature on RSE presented in Chapter 2 strongly indicates that practical methods of instruction in pedestrian skills are the most likely to be effective. The maturation theory of development assumes that the child will be able to perform the road safety skills even when not taught. I argue that intervention is critical for teaching the child road safety skills, and that the maturation theory of development is not supported by the literature on the acquisition of these skills.

3.6.2 Behaviourist theory

Theorists such as Watson, Skinner, and Bandura contributed a great deal to the environmentalist perspective of development (Glover & Bruning, 1990, pp. 300-303).

Environmentalists believe the child's environment shapes learning and behaviour; in fact, human behaviour, development, and learning are thought of as reactions to the environment. This perspective leads to the conclusion that young children develop and acquire new knowledge by reacting to their surroundings (Slavin, 2000). This developmental theory is called behaviourism. It is characterised by experimental methods and underpinned by variables that can be observed, measured and manipulated. It avoids whatever is subjective, internal and unavailable, i.e. mental or cognitive aspects of the child. One of Bandura's tenets is reciprocal determinism which states that the individual and the environment influence each other (Boeree, 1998; Mayer, 1987, pp. 87-88).

Behaviourism is a worldview that assumes a child is essentially passive, responding to environmental stimuli. The child starts off as a clean slate (i.e. *tabula rasa*) and behaviour is shaped through positive or negative reinforcement (Eggen & Kauchak, 2001; Mayer, 1987; Glover & Bruning, 1990). Both positive and negative reinforcement increase the probability that the antecedent behaviour will happen again. In contrast, *punishment* [emphasis mine] (both positive and negative) decreases the likelihood that the antecedent behaviour will happen again. Positive antecedent behaviour indicates the application of a stimulus; negative antecedent behaviour indicates the withholding of a stimulus. Learning is therefore defined as a change in behaviour in the learner. Earlier behaviourist work was done with animals (e.g. Pavlov's dogs) and generalised to humans (Slavin, 2000; Biehler & Snowman, 1997).

Behaviourism precedes the cognitivist worldview. It rejects structuralism and is an extension of Logical Positivism (Learning Theories, 2008). According to behaviourists, learning is a relatively enduring change in observable behaviour that occurs as a result of experience (Eggen & Kauchak, 2001, p. 214; Slavin, 2000). This theory is underpinned by the following variables: attention, retention, reproduction and motivation.

3.6.2.1 Attention as a variable for learning in behaviourism

According to behaviourists, learning depends on paying attention to the model. In the context of the study the model would be the teacher and the parents. If a child has a problem paying attention their learning will suffer. This implies that if the child has no interest in what they are learning or they are distracted by other factors their learning progress will decrease. Some aspects of the teacher or the model might affect the child's learning. In other words, if the presentation of the lesson is boring or dull this will affect the child's learning (Biehler & Snowman, 1997; Mayer, 1987).

In the context of this study it means that if the teachers or parents are not competent in the teaching of road safety skills this will affect the learning process according to the behaviourist. The implication for the learning of road safety skills is that the focus is more on the model (teacher/parent) than on the child because the child imitates the teacher or model. Parents as community members should therefore provide a positive role model for the child by using the road in a safe way so that the child could internalise this behaviour.

3.6.2.2 Retention as a variable for learning in behaviourism

Retention refers to the process of internalising what has been learnt. What it means is the child should be able to act out what they saw the model or teacher doing. This, according to the behaviourists, will mean that the learning process has been successful. According to the behaviourist this manifests itself through language and mental images. This entails because one stores what has been learnt through mental languages. One brings out these mental images or descriptions through one's own behaviour to show that one has learnt what the model has showed (Biehler & Snowman, 1997; Learning Theories, 2008).

3.6.2.3 Reproduction as a variable for learning in behaviourism

The reproduction theory refers to the statement that what has been learnt previously has to be reproduced. The child has to translate what he internalised i.e. the images or descriptions into actual behaviour. Ability is the determinant in this stage of learning. A

child can watch a model performing a task but if they do not have the ability to reproduce the act nothing will happen. The ability to reproduce or imitate improves depending on practice. Another important factor about reproduction is that our ability to imitate improves with practice at the behaviours involved. It is against this background that all the RSE programmes that have been implemented in the Netherlands and the UK are characterised by a strong element of practice at the actual road environment (Slavin, 2000; Bergan & Dunn, 1976, pp. 136-140). This theory could prove valuable for this research project.

3.6.2.4 Motivation as a variable for learning in behaviourism

The key to learning according to this theory is motivation which takes place when the child has a positive role model worthy of being imitated. Conversely, threats of punishment and lack of a positive role model demotivate the child and affect their learning. The child must be motivated to imitate. There must be an incentive or reason for doing the activity. The implication for road safety is that the child must understand the fundamental aspect of road safety, that if they are not learning they will be killed on the roads. This should serve as their ultimate incentive. In contrast to motivation, punishment can affect the learning process negatively (Slavin, 2000; Mayer, 1987; Bergan & Dunn, 1976, pp. 136-140; Boeree, 1998).

School readiness, according to the behaviourists, is the age or stage when young children can respond appropriately to the environment of the school and the classroom (e.g., rules and regulations, curriculum activities, positive behaviour in group settings, and directions and instructions from teachers and other adults in the school). The ability to respond appropriately to this environment is necessary for young children to participate in teacher-initiated learning activities (Biehler & Snowman, 1997; Mayer, 1987).

My understanding of the shortcoming of the behaviourism theory is that the environment in some schools might not lend itself to the learning of road safety. Teachers and parents have to intervene consciously and inculcate road safety consciously in the learner. Leaving the children to their own devices to experiment in a dangerous road

environment might cost them their lives. A well structured curriculum on road safety has to be followed and sustained to prepare the child for the outside world. A realistic environment has to be created as road safety is best learnt in a real road safety environment. The child learns safe road user behaviour through experience.

The success of the behaviourist theory in teaching road safety skills to children presupposes the availability of positive role models in the form of teachers and parents and might not be applicable in total in this study. As indicated in Chapter 2, children imitate their parents and if parents and teachers are not positive role models, any programme based on the Social Learning Theory will not yield the required results. The simulation training skills applied at the JTTC are based on this learning theory (NRSC, 1985; Department of Transport, 1990; Child and traffic, 1980). The major weakness of this learning theory is that it places greater emphasis on the teachers and parents as role models. Millions of rands were spent on advertising by *Arrive Alive* in an attempt to change people's behaviour, but given the number of pedestrian deaths on the roads the success, if any, is minimal. The assumptions of the theory that the child knows very little and has to be spoon-fed information are diametrically opposed to the outcomes-based education (OBE) approach used in schools in South Africa. It encourages children to depend on teachers for information rather than seeking the information themselves. Another weakness of this learning theory is that it focuses on the teacher or the model rather than the child. The success of the learning programme depends on the teacher. This will eventually create a dependency syndrome where children depend on the teacher for every facet of their learning experience rather than taking the initiative and responsibility for their own learning. This theory therefore undermines the child's metacognitive skills – the thinking and study skills. Metacognition refers to knowledge about one's own learning (Department for Transport, Report No.6, n.d.). Learning road safety skills is based on the assumption that the child should be empowered to make critical decisions when they are alone in the road. Another weakness of behaviourism is that learning does not necessarily depend on incentives (positive reinforcement) and threats of punishments.

3.6.3 Constructivist theory

The constructivist perspective of readiness and development was advanced by theorists such as Piaget, Montessori and Vygotsky (in Slavin, 1994; Mayer, 1987; Glover & Bruning, 1990). Although their work varies greatly, each articulates a similar context of learning and development. They are consistent in their belief that learning and development occur when young children interact with the environment and people around them (Campbell, 1997; Hunt, 1969). One of the most important principles of educational psychology is that teachers cannot simply provide students with knowledge. Students must construct knowledge in their own minds (Slavin, 1994). The essence of constructivist learning theory is that children must construct, discover and transform complex information if they are to make it their own. The constructivist theory sees children as constantly checking new information against old rules and then revising the rules when they no longer work. This view has profound implications for teaching, as it suggests a far more active role for children in their own learning than is typically executed in the majority of classrooms (Slavin, 1994, p. 225). While cognitive constructivism focuses on the individual and the construction of knowledge, social constructivism suggests that knowledge exists in a social context and is initially shared with others instead of being represented solely in the mind of an individual (Eggen & Kauchak, 2001).

Learning as a bottom-up process which begins with contextualised action was identified as common to both Vygotsky and Piaget (in Department of Transport, 1996). Although they have many elements in common, the point of departure is that for Piaget learning is seen as a process of internal construction (in Schwebel & Raph, 1973; Slavin, 2000). For Vygotsky learning takes place through the internalisation of socially constructed or guided behaviour (in Slavin, 2000). Vygotsky's theory is one of the foundations of constructivism. It states three main themes: Social Interaction, the More Knowledgeable Other and the Zone of Proximal Development. These themes are described in the following sections.

3.6.3.1 Social Interaction in the process of cognitive development

According to Vygotsky Social Interaction plays a fundamental role in the process of cognitive development for the child (in Slavin, 2000). In other words, for the child to develop cognitively they need to be socialised with other people. For Vygotsky learning could take place only when the child has been in an interactive process to learn from other people. Once this has been done, social learning can then begin. RSE is a social activity where people learn and interact with each other. Social interaction therefore forms the basis for the learning of road safety skills. Ideally, the people that the child socialises with have to serve as positive role models to the child. In contrast to Piaget's understanding of child development (in which development necessarily precedes learning), Vygotsky felt social learning precedes development. An isolated child will not develop cognitively; they need the intervention of other people to develop to their full potential.

3.6.3.2 The More Knowledgeable Other: Teachers and parents as role models

For the child to develop to a stage where they can learn, they have to be in the company of the role model, what Vygotsky calls the More Knowledgeable Other (MKO) (in Mayer, 1987). This could be anyone who has more knowledge and experience to serve as a model to the child. The More Knowledgeable Other could be the teacher, parents and any other community member who has a positive behaviour that could be emulated by the child. This is pertinent to road safety as the child has to adopt road use behaviour from teachers, parents and peers who serve as role models. If their road use is unsafe the child is going to internalise this behaviour to his detriment. The most important people as the MKO in the context of this study are the parents and the teachers. If they do not serve as positive role models the child will never develop safe road user behaviour as they imitate their models.

3.6.3.3 Learning takes place in the Zone of Proximal Development

For Vygotsky learning takes place in the Zone of Proximal Development (ZPD). The ZPD is the distance between a child's ability to perform a task under adult guidance

and/or with peer collaboration and the student's ability to solve the problem independently. According to Vygotsky, learning occurred in this zone (in Slavin, 2000).

Vygotsky focused on the connections between children and the sociocultural context in which they act and interact in shared experiences. Children use this environment and opportunity to develop language which is critical for their future learning. According to Vygotsky, humans use tools that develop from a culture, such as speech and writing, to mediate their social environments. Initially children develop these tools to serve solely as social functions, ways to communicate needs. Vygotsky believed that the internalisation of these tools led to higher thinking skills. According to this theory, human being use speech and other human capabilities to help them understand the surroundings and learn. Therefore, without language the child will not learn. Therefore, teachers and parents intervene in the child's development and learning through language.

3.6.4 Social development theory

Vygotsky is one of the proponents of the social development theory (in Eggen & Kauchak, 2001, pp. 60-61). The major theme of Vygostsky's theory is that social interaction plays a fundamental role in the development of cognition. A second aspect of Vygotsky's theory is the idea that the potential for cognitive development depends upon the ZPD: a level of development attained when children engage in social behaviour. Full development of the ZPD depends upon full social interaction. The range of skills that can be developed with adult guidance or peer collaboration exceeds what can be attained alone. In short, in the social development theory "socialisation is key". Two principles emerge from the social development theory: socialisation and cognitive development. For children to fully develop cognitively they require social interaction. Furthermore cognitive development is limited or is dependent on the age range of the child (Schunk, 2008, pp. 242-246; Social Development Theory, n.d.; Rosin, 1973; Eggen & Kauchak, 2001, pp. 56-57; Riddle & Dabbagh, n.d.).

Vygotsky's work complements the work of Bandura on social learning and is a key component of situated learning theory. His focus was also on cognitive development,

just like Bruner and Piaget. For the purpose of this study, the relevance to Piaget's theory on cognitive development is given very cryptically. For Piaget cognitive development happens in stages. Cognitive development is gradual as is physical development. In each phase there is a repetition of processes of the previous level in a different form of organisation (schema) (Rosin, 1973). Each child is unique and progresses at his own rate in this realm of development. The three phases of cognitive development according to Piaget (in Rosin, 1973) are:

- Period of sensorimotor intelligence (0 to 2 years)
  During this period the infant moves from a neonatal, reflex level of complete self-world to a relatively coherent organisation of sensorimotor actions vis-a-vis his immediate surroundings. This organisation does not involve symbolic manipulation, but only perceptual and motor adjustments.

- Period of preparation for and organisation of concrete operations (2-11 years)
  This period is characterised by egocentric thinking expressed through transductive reasoning, juxtaposition, syncretism, realism, artificialism, animism.

- Period of formal operations (11-15 years) (Williams & Stith, 1974, pp. 287-289; Logic, Programming, and Robotics for non-technical students, 2002; Mayer, 1987, p. 23; Rosin, 1973).

During this period the adolescent learns with pure possibility, abstractions, prepositional statements. Where the concrete operational child can deal effectively only with the reality before him, the formal operational individual is not bound in this way.

Social development theory is an elaboration of constructivism. It places emphasis in cognitive development and social interaction as the *sine qua non* for learning. Studies from the developed countries show that cognitive development and social interaction form the basis for RSE. In road safety teaching and learning the cognitive development of the child has to be considered to ensure that he has developed to the level that he will be able to internalise the new knowledge (Schunk, 2008, p. 253).

In the final analysis of this study, an appropriate approach or approaches could be identified. If the rural community (social interaction) offers the child very little to imitate then he is not going to behaving in a responsible manner in the roads. An implication for the study is that teachers who are involved in the teaching of RSE, involving skills like the safe crossing of the road, have to understand the principles of development as articulated by the various developmental theorists like Piaget, Vygotsky and Bruner. This is an aspect I intend to research when collecting data from the teachers.

In the following paragraphs I elaborate on the possible applications of Vygotsky and Piaget's theories of social development in the learning of road safety skills. Many schools have traditionally held a transmissionist or instructionist model in which a teacher "transmits" information to children. In contrast, Vygotsky's theory promotes learning contexts in which children play an active role in learning. This sets the social development theory apart from the behaviourist theory in that it places emphasis on the learner. The child therefore has to take responsibility for his/her learning. Roles of the teacher and children are therefore shifted, as a teacher should collaborate with his or her children in order to facilitate the construction of meaning. Learning therefore becomes a reciprocal experience for the students and teacher. Vygotsky's emphasis on the socially directed nature of learning, in common with Piaget, characterises it as a bottom-up, constructive process. More complex activities or functions build upon the simpler constructs, and the range encompassed by the Zone of Proximal Development moves forward as learning progresses (Eggen & Kauchak, 2001; Thomson *et al.*, 1996).

The key to developmental progression within Vygotskian theory is mastery. Whilst the child may be capable of more advanced activity when working under the direction of another person, learning will not occur until they begin to take upon themselves the responsibility for directing their own behaviour. Over time many of these behaviours will become internalised as covert mental operations. As this happens new insights become possible and generalised understanding begins to emerge. This is the basis of true mastery. Language plays a critical role in learning, according to Vygotsky. The interaction that takes place between the child and the educator during and within the Zone of Proximal Development is guided by language through dialogue.

For Piaget all knowledge is a result of a process of internal construction directed towards ever better representations of the world in terms of the activities that could be carried out within it and the objects to which those activities applied. This basic building block of the process of learning is called a scheme. Subsequent learning occurs through the operation of three interrelated processes – assimilation, accommodation and equilibration. Learning, according to Piaget, takes place through the accommodation, differentiation and coordination of schemes which detail specific actions towards specific objects; and it constitutes a direct response to perceived discrepancies or conflicts between those schemes and experience (Department for Transport, 1996). To summarise Piaget's learning process, it means that the child will evaluate the environment and construct a reality that is based on the new set of circumstances. In the case of road safety skills the child will evaluate the new variables and accommodate them in his schemes or skills of crossing the road and adjust the performing of the task to suit the new challenges or circumstances (in Eggen & Kauchak, 2001, pp. 294-296).

Constructivism as indicated above therefore gives the child the respect and human dignity to construct their own understanding of reality. As opposed to behaviourism in constructivism the child takes the learning process as his responsibility. They use the environment to help them build up their knowledge. It is against this background that social interaction is critical to the learning as they learn from other people.

This implies that children are not just passive recipients of the learning content but rather they take part by making their own knowledge using the surroundings and the available resources. They can either accept or reject what they think is not essential to them. In conclusion, constructivism empowers the child to make his own decisions based on what they regard as important. Children continuously test what they have learned through social negotiation i.e. whether what they are doing is accepted or rejected by the general public. Each person has a different interpretation and construction of the knowledge process.

Constructivism does not mean that teacher's role is diminished or the teacher is relegated to the background what is means though is that all knowledge is constructed

from the children's previous knowledge. In other words what the child already knows serves as the basis for more learning. The child does not come to the learning situation empty-handed; they come with a useful knowledge that they use to build on (Learning Theories Knowledge base, 2009; Constructivism at Learning-Theories.com, 2009).

In contradiction to the maturationist theorists' position, Piaget according to Schwebel and Raph (1973) does not see development as a linear process but as stages that are not pre-determined but are informed by various variables like milieu and experiences. He divides intellectual development into three categories: The period of sensorimotor intelligence; the period of preparation and of organisation of concrete operations of categories, relations and numbers; the period of formal operations. To Piaget and other cognitivists like Bandura learning is underpinned by intellectual (Piaget) and cognitive (Bandura) development within a social milieu. Therefore, according to the social cognitivists, they focus on the idea that much of human learning occurs in a social environment (Eggen & Kauchak, 2001). In the RSE realm physical maturity of development does not necessarily mean that the individual will learn the road safety skills needed for their safety.

In the realm of RSE Piaget's theory of instruction holds some light in that cognitive and language development are at the centre of learning. The relationship between the LO and Languages learning areas has already been given in Table 3.4. This is supported by the role of the community which serves as a point of reference for the individual to learn beliefs and attitudes (Schunk, 2000; Biehler, 1974). This instructional theory is apt for the road safety realm where a lot of purposeful interventions are necessary to prepare the child for the world out there. For instance, the literature review in Chapter 2 indicates that best practices are that purposeful intervention has to take place in the school and home environment to ensure the survival of the child not only in his community but in other settings as well. It would be irresponsible to release the child into such a dangerous environment without preparing them for it (WHO, 2008; Towner & Errington, 2004).

Constructivists view young children as active participants in the learning process. In addition, constructivists believe young children initiate most of the activities required for learning and development. Because active interaction with the environment and people are necessary for learning and development, constructivists believe that children are ready for school when they can initiate many of the interactions they have with the environment and people around them (Schunk, 2008, pp. 236-237).

Constructivist-influenced schools and educators pay a lot of attention to the physical environment and the curriculum of the early childhood classroom. Classrooms are often divided into different learning centres and are equipped with developmentally appropriate materials for young children to play with and manipulate. Teachers and adults have direct conversations with children, children move actively from one centre to another, and daily activities are made meaningful through the incorporation of children's experiences into the curriculum. At home, parents engage their young children in reading and storytelling activities and encourage children's participation in daily household activities in a way that introduces such concepts as counting and language use.

When a young child encounters difficulties in the learning process, the constructivist approach advocates individualised attention and customisation of the classroom curriculum to help the child address their difficulties. The implication for the teacher is that they have to be resourceful in adjusting their teaching approaches to suit children who are not coping with the normal classroom teaching. I, as a researcher, see a challenge in this regard as the school used in the case study is situated in a rural environment and schools in this areas struggle to attract the best teachers.

Although the modern understanding of child development and the learning process is based on constructivism (Slavin, 2000) in a rural community like the Moloto area, their understanding of a child is still that the child must follow the teachers' and parents' examples. Maturity and school readiness is measured by the ability to follow instructions from teachers and parents. Any initiative outside this understanding is not tolerated. Literature shows that this view is widespread even in communities that are not

necessarily rural (Biehler & Snowman, 1997; Glover & Bruning, 1990; Schwebel & Raph, 1973; Eggen & Kauchak, 2001). The implication of this for the learning of road safety is that any child who takes the initiative in the learning process will be frowned upon and be reprimanded. He is expected to follow instructions from elders and teachers. A major drawback for constructivism is that it is based on the assumptions that parents are active participants in the education of their children.

In the Moloto area which is the site for this study the level of education among parents, if any, is very low, such that they cannot contribute meaningful academic input to children's education. Most teachers are not competent to teach road safety competencies and they are not in a position to structure learning programmes that will be meaningful to the child. In a developed world where children's parents can teach their children road safety skills this could be an appropriate teaching approach. Constructivism presupposes that the child who is not coping has to be given individual attention and an individual learning programme. But in the context of this case study this is impossible because of the large classes as the average class has sixty children. Therefore it seems like the environment might have huge implications for RSE in this specific case.

3.7   The impact of the rural environment on children's learning of road safety

The research site where the target group resides is a typical rural environment. The common mode of transport consists of minibus taxis and buses. The environment does not expose the child to a variety of road safety scenarios like their urban counterpart. There are no robots, pedestrian crossings and other speed calming measures. This type of environment puts the young child at a disadvantage compared to his/her urban counterpart. Literature on road safety indicates that the environment is the best teacher. If the child is in an environment that does not prepare him to negotiate his way to school the chances of being involved in an accident are very high. Chapter 2 illustrates this point clearly by indicating that in general the South African public is highly exposed to road traffic accidents as they walk to school and other institutions (Fourie, 2009; Rademeyer & Isaacs, 2009).

Munro (1969, pp. 152-154) underscores the importance of the environment in education and development in the following way:

Individual personality becomes adjusted to the environment by experience of people and things, from which are crystallised meaningful ideas of how the world is arranged. In this process by far the most effective external agent is language. If adults are subject to environmental stimulation, then surely it must be even more effective during maturational period, the more so the further back we go. In other words a bright child (genetically bright, that is) will get brighter if socially and environmentally stimulated and a dull child not so stimulated will get progressively duller. The pattern of growth in fact is not fully pre-determined.

The child's family prepares him/her for success in the outer world. For children to learn and internalise road safety skills the family must play a very important role in setting the foundation for their success. Smith (1974, p. 79) asserts that:

Consideration of the child's family is as basic to understanding his development as is that of his society in general. This littlest world has provided his first encounter with the challenges of identity, acceptance, relationships, and achievements. The family can either prepare him for success in his ever-expanding world, or it may handicap him - perhaps irreparably. The family environment just like the community environment can prepare or hinder the child's success in later life.

Quoted in Emerging Voices: Policy Considerations (2005, p. 2) Nelson Mandela said the following about the rural environment:

I have often said that the most profound challenges to South Africa's development and democracy can be found in its rural hinterland. These areas, systematically and intentionally deprived of the most basic resources under apartheid, continue to lag behind the rest of the country in the post-apartheid era.

In the context of RSE the rural child is more likely to be in an environment that does not have simulated road safety settings called the JTTC such as in an urban environment. The JTTC facility established by the GRSP and a non-governmental organisation (NGO) called *Drive Alive* for the schools of Eldorado Park south of Johannesburg come to mind.

Emerging Voices (2005, p. 2) offers some dichotomies of urban and rural settings. It starts though by cautioning about the difficulty of providing a correct definition of these concepts in the South African context. It reads:

> *What counts as rural or even urban are extremely difficult to define. This is especially so given the deep, continuous and intertwined relationships of urban and rural in South Africa. Rurality highlights: isolation, vulnerability, lack of opportunity … It also represents: a sense of community and a commitment to traditional values. Descriptions of poverty and rurality are seen in relation to urban as that which denote, on the one hand, opportunities and wealth and on the other a sense of deficit and strength.*

In the context of this study and the teaching of road safety in rural primary schools "advocating for quality rural (road safety) education that is responsive to the realities of rural communities does not imply that rural communities (children) should be prepared solely for rural livelihoods. If anything, rural (road safety) education has to prepare young people for a complex and interspersed world of rural and urban life. And thus seeing rurality and urban as part of a continuum of complex relationships challenges us to rethink and re-imagine what that education might look like" (Ibid, p. 5; Quimby, n.d.).

Another challenge facing the rural child is the unavailability of adequate resources that are necessary for effective and quality education. Multichoice Africa Foundation (n.d.) points out that:

> *As the national and provincial departments of education strive to provide quality education which is relevant, cost-effective and accessible to all, rural areas continue to face the disadvantage of distance. Just as getting to school is no guarantee of quality learning, rural schools' distance from cities also militates against teachers and children having access to up-to-date educational materials.*

Kollapen (2006, p. 32) brings into sharp focus the contrast of the rural and urban settings and their differences in terms of opportunities and benefits.

> *…. One of the gravest challenges we face as a nation in this regard is the matter of bridging the divide between the two worlds, which is South Africa. These two worlds have been differently described but, in the main, they represent one that is affluent, resourced and largely white, while the other is poor, under-resourced and largely black. There is thus much to be accomplished in efforts to close this gap.*

These two worlds enjoy different levels of safety, and indeed the efforts that go into realising some of the socio-economic rights referred to are undermined when critical matters of safety are not dealt with decisively. A few examples may illustrate this point. The state has invested considerable resources in building schools, and to provide much needed education to the children of South Africa. Yet too many children have to navigate a high-risk route to school in order to access this education. Un-roadworthy vehicles, the lack of adequate public transport, resulting in children walking long distances across dangerous terrain to get to school, and crossing rivers all place the young child at great risk (see also Museru *et al.,* 2003; Monson *et al.,* 2006).

In the South African context the rural and peri-urban environments share similarities in the unavailability of resources. Peri-urban areas are areas outside the formal boundaries and urban jurisdictions. They are between the urban and the rural areas. They are in the process of urbanisation. Peri-urban areas have some of the following characteristics:

- Fast and unplanned growth resulting in, among other things, negative environmental health issues and environmental degradation;

- Service infrastructure is inadequate to meet even basic needs;

- A significant proportion of residents are in lower income categories;

- Social infrastructure does not meet basic needs (Draft peri-urban Growth strategy Policy, 1997; Rural Development Strategy of the Government of National Unity, n.d.)

In the context of the study peri-urban areas are those areas that are outside the towns and cities; and the settlements are mainly squatter camps being tied to the economies of the contiguous urban areas. As a result of long distances to schools and other facilities in rural areas, road accidents involving children are a major problem in many developing countries. Sayer and Palmer (1997, p. 3) found that rural accidents are a serious problem in many developing countries (Odero, 2004, p. 5; Ribbens, 2002). Their study found that:

Few drivers reduce speeds through villages or give way to pedestrians. Houses and facilities such as schools and shops are often found on the opposite side of the road, creating many pedestrians crossing movements. In villages where street lighting is seldom found, crossing a busy road at night

can be particularly dangerous. Poor pedestrian facilities and houses built directly onto the roadside potentially contribute to the pedestrian accident situation.

The situation described above is akin to the one facing the child in the Moloto area, the site for this study. This background on the environment is essential for the study as it provides a holistic understanding of the environment which a typical child in the area faces. The road running through the village is used by motorists who are rushing to work in the Tshwane Metropole.

Studies show that the problems of safety on rural roads have been neglected in comparison with those in urban areas (Peden *et al.,* 2004; Thomson *et al.*, 1996). It was further found that in rural areas compared with urban areas, causal factors are distinctively different and the countermeasures are insufficient, especially in terms of resources for engineering and enforcement. Some distinctive rural crash causal factors found were:

❖ Higher travel exposure (in deaths per 100 million vehicle kilometres travelled);

❖ Fewer alternative modes of transport;

❖ Greater driver fatigue and boredom;

❖ Wider variety of road conditions (width, sealing, alignment, divided);

❖ Many narrow, unsealed roads;

❖ Larger number of roadside hazards and uncontrolled animals;

❖ Greater speed variation, caused by stretches of single lanes and the presence of buses, heavy trucks and agricultural vehicles, generate more crashes through risky overtaking, than on urban roads, enforcement of traffic laws by traditional methods is more difficult and expensive, and there are longer response times to provide emergency care and trauma recovery for crash victims also.

All other variables notwithstanding the main common denominators contributing to children dying on the roads in the Moloto area are lack of education, together with the

culture of impunity and total disregard for road rules. This situation calls for a paradigm shift in the way we teach road safety in South Africa in both the formal and the informal environment. We need to find an effective way of teaching road safety to children in order to inculcate the culture of safe road use in primary schools.

Studies show that there is a general consensus among decision makers in various countries on the urgent need to control and stabilise morbidity and mortality particularly as injuries and deaths resulting from road accidents are ranked as one of the highest causes of loss of life in most countries around the world (Lopez & Murray, 1996; PIARC Technical Committee on Road Safety, 2003).

Proponents of the right to safety, however, differ on the priorities for action: the relative role that organisational structures and powerful elites play in producing hazardous systems; the effectiveness of approaches that give priority to technological fixes over behavioural change; the relative role of interventions by the state and government and by civil society organisations; and the need for creating regulations, setting a standards, and ensuring police enforcement. Mohan (2003) argues that it is very difficult to resolve these issues in the absence of a basic ethic that gives a strong underpinning to the debate. Current efforts to reach consensus on a document that spells out the rights of people to live lives safe from harmful injury are expected to help reduce the differences in ideologies and priority setting (Monson *et al.,* 2006).

3.8   Conclusion

The theories described in this chapter align with the theoretical framework given in Chapter 2. The theoretical framework for the study as elaborated in Chapter 2 is that education as an intervention measure to reduce the deaths on the roads particularly for pedestrian is the viable measure in areas that are rural in nature like the Moloto area. The literature review in Chapter 2 indicates that for this to work, parents, community, teachers, road safety officers and children have to work for the same goals using the same approach so that their efforts complement each other.

The continuation of the literature review in this chapter indicates that the education programmes that were implemented in developed countries like Sweden and the

Netherlands and the United Kingdom were aimed at behaviour modification. The teaching approach used in schools that implemented the programmes was based on the social learning theory of the behaviourists. This was based on the assumptions that underpin the learning of road safety skills that children have to learn through modelling using teachers and parents as role models. What this chapter illustrates is that child development is critical for the implementation of road safety skills as teachers have to understand how children learn and the developmental process of children. This should then guide them to grade the learning content according to the capacity of the children (Department for Transport, 1996; Department of Transport, 1990; NRSC, 1985). This approach is also followed in South Africa, evidenced by the fact that most road education programmes are based on the use of JTTC which are areas for simulation of authentic road safety environments.

A RSE programme has to consider the developmental phases and the relevant theories concerning the young child such as the cognitive development for its sustainability and effectiveness. Road safety is best leant through experience in a real road safety environment. The introduction of road safety at home by parents or elders and pre-school level by the teacher is crucial as it forms a continuum for the child when he goes to primary school. In developing countries this is critical as children are considered "adults" who can negotiate their way to school unaccompanied (WHO, 2006). In the next chapter I discuss the research methodology, the methods and data collection strategies applied during the investigation.

CHAPTER 4. RESEARCH METHODOLOGY, METHODS AND DATA COLLECTION STRATEGIES APPLIED DURING THE INVESTIGATION

4.1 Introduction

This chapter explains the design and methods that I used in this study. All the steps I followed during the process of data collection and the key philosophical and methodological issues underpinning the study are discussed. The methods I used for gathering data are outlined; together with my strategies to improve the validity and reliability of the data.

I also discuss the challenges that I experienced when collecting data and how I attempted to overcome them. With the data collected I intend to illustrate the response of rural children to the road safety inputs that they receive with a view to understanding the RSE phenomenon and to offer recommendations that could help in the teaching and learning of road safety. The interpretative paradigm enabled me to interpret the voices of the children, the teachers and the parents in an attempt to understand the RSE phenomenon.

4.2 Research design

Labovitz and Hagedorn (1981, p. 42) describe a research design as a set of logical procedures that, if followed, enables one to obtain the evidence to determine the degree to which one is right or wrong. Thus, the research design helps to provide possible answers to research questions while minimising bias. A research design assists to examine specific research questions in a valid, systematic and objective manner by reducing as many rival explanations as possible and yet isolating the variables of interest to the research question (Heppner *et al.*, 1992, p. 43). To paraphrase Seaman (1987, p. 165-166), a research design is the way in which the researcher plans and structures the research process. It provides a flexible signpost or guidepost that keeps the research headed in the right direction.

This thesis is a qualitative study that focused on one school in rural Mpumalanga in a village called Moloto, forty kilometres east of Pretoria. A qualitative research design was

chosen for the enquiry as I planned to observe, discover, describe, compare and analyse the characteristic attributes of this school and underlying dimensions and variables of the RSE of this school (Seaman, 1987, p. 169; Heppner, Kivlighan & Wampold*.,* 1992, p. 194-195). The ontological assumption underlying the choice and use of the qualitative study was that the qualitative research emanates from the phenomenological perspective which tends to emphasise internal mental events as the fundamental reality of existence while the epistemological assumption for the choice of the study is that knowledge is actively constructed, not passively observed (Seaman, 1992, p. 195). The qualitative research design is therefore appropriate for this study as it seeks to explore and understand the ways that children give meaning to their understanding of RSE.

The paradigmatic position of the study is the interpretative paradigm. Interpretative research is concerned with understanding the world or reality as it is and describing the subjective reality of the participants. This paradigm uses qualitative research methods (Osman, 2007; Stake, 1995; McMillan & Schumacher, 2001, p. 504; Mason, 2002, pp.24-25). Qualitative designs require that the person making the interpretations must be in the field, making observations, exercising subjective judgment, analysing and synthesising while being aware of their consciousness (Stake, 1995, p. 41). Fox and Bayat (2007, p. 10) posit that interpretative research assembles a comprehensive collection of records related to people, actions, context and the perceptions of participants to serve as the basis for the inductive production of explanatory theory. In this study I interpreted the children's voices in order to represent their understanding of RSE.

In a qualitative design the research involves a holistic enquiry carried out in a natural setting where data is collected through field observation. Cozby (1998:p.48) notes that this field observation is sometimes called "field work" or simply "naturalistic observation". In a field observation the researcher makes observations in a particular natural setting (the field) over an extended period of time, using a variety of techniques to collect information. I chose a case study design. A case study may be a detailed examination of a single subject, a single setting, a single set of documents or one

particular event (Field & Morse, 1985, p. 87). In a case study the unit of analysis is focused. In the case of this study I focused on one school in the Moloto village. Ten children, ten parents and two teachers were used as the primary sources of data. The unit of the study – the school – was distinct and the focus was on the response of children to the RSE programmes. A case study is about choosing a case that will help to understand the phenomenon (see Mason, 2002, pp. 121-142). In my study I attempted to describe the rural community in as much detail as possible as I worked in the community for several weeks.

As humans are the primary data gathering instrument this research design demands that a researcher immerses himself or herself in the situation (see Mason, 2002, p.84). The field researcher therefore observes everything – the setting or field itself, the patterns of personal relationships and people's reactions to events that occur (Borg & Gall, 1998). The purpose is to provide a holistic picture of the field or case (Hepper, Kivlighan & Wampold, 1992, p. 198). The researcher must write detailed notes of what happened or had been observed at the end of the day. This qualitative design requires that the researcher uses a variety of techniques to gather information – observing people, and events, using key "informants" or influential people to provide inside information and talking to people (interviewing them). In this study I provided as much data as possible about the participants of my case study.

Research participants are chosen for their potential to yield rich data which will help in answering the research questions (Jackson, 1995). The qualitative design therefore uses the purposive selection. The choice of participants in this study is the children of the school. With regards to the parent and teacher participants they were selected purposively to help yield rich data for the study. The teachers were teaching road safety within LO which encompasses the teaching of road safety competencies and the parents interviewed were the parents of the children I studied.

When interpreting the data the field researcher's first goal is to describe the setting, the events and the persons observed. The second and equally important goal is to analyse what was observed. The researcher interprets what occurred, essentially gaining insight that help explain the data and make it understandable. Such an analysis is done by

building a coherent structure to describe the observations. A good field observation will support the analysis by using multiple data and confirmations. For instance similar events may occur several times, similar information may be reported by two or more people, and several different events may occur that all support the same conclusion (Merriam, 1998; Maykut & Morehouse, 1994; Mason, 2002, pp. 24-25; Gobo, 2005). The qualitative design, according to Maykut and Morehouse (1994, p. 26), is flexible enough to capture the complexity, subtlety, and constantly changing situation which makes up the human experience. In my attempt to study this case I gave as much information as possible to show the complexity of the rural environment of Moloto.

In the context of this study I attempted to understand how the children in their specific environment, as people who are exposed to danger when negotiating their way to and from school, interpret and understand this danger. I also wanted to know in the context of the constant danger facing them, how they responded to the RSE that they received at school as part of the LO (LO) learning area. This approach was informed by the knowledge that human behaviour is context-bound. Understanding this reality required that I gather a rich data set to enable me to describe the social reality that the children make of their environment.

4.3 Participants and the case study

Based on my knowledge of the subject, a case study allowed me to interpret and understand the participants yielding information to assist in addressing my research questions (McMillan & Schumacher, 2001, p. 175). I purposefully chose the two teachers as part of the case study who taught LO. The reason for the decision was that they were involved in the teaching of road safety skills and would be able to provide data that could contribute to my understanding of the phenomenon under study. In addition, I studied the parents of the children to inform me on their input of road safety skills on their children.

Cozby (1989, p. 54) states that a case study "provides a description of an individual". This individual may also be a setting such as a business, school or a neighbourhood. Depending on the purpose of the investigation the case study may present the

individual's history, symptoms, characteristic behaviours, reactions to situations or responses to treatment". To achieve a degree of validity a variety of empirical research methods were used to collect as much data as possible.

The case study method is in line with the qualitative design of the study which seeks to explore and construct an understanding of the response of rural children to the RSE programme to which they are exposed at school. This is informed by the need to establish whether the amount of money invested in road safety programmes is making an impact. Billions of rands are lost in the country due to road accidents (Road Traffic Management Corporation, 2005).

For this study one school was chosen as the case study. The choice of the school was informed by the reaction that I observed when an industrial theatre group consisting of students from the University of the Witwatersrand was taken to the school by the Department of Transport, my previous employers. The locality of the school in the centre of the village and near the Moloto road also influenced the choice of the school. This is elaborated in 4.4.3. Ten children in the Intermediate Phase were selected. Ten children were chosen randomly. The parents of these children were approached to take part in the study. The ten children were chosen randomly from two classes. Ten children in two classes in the Intermediate Phase were given the opportunity of participating in the two participatory activities that were employed to enrich the collection of data, namely the drawing activity and the writing of road safety messages.

The choice of the case study was informed by the purpose of the study, which was to explore the responses of children to road safety programmes. The participants who were purposively chosen had to help the researcher answer the following question: what work do I want my sample to do? Mason, (2002, p. 121) says that the work you are asking for your sample is to help provide you with the data which you need to address your research questions. Through appropriate data sources the sample should provide useful and meaningful empirical contexts, illustrations or scenarios. I chose this sample to give me access to data that will allow me to develop an empirically and theoretically grounded argument about something in particular – the intellectual puzzle. The strategy for the study was to use the child participants as primary sources of data.

As they are the focus group for the study they are in a better position to provide in-depth understanding of the RSE phenomenon under study (McMillan & Schumacher, 2001, p. 404; Gobo, 2005; Mason,2002, pp. 121-122).

The conduct of the children at the selected primary school in the Moloto area was observed in a real-life situation while using the road infrastructure to and from school, to observe whether they conducted themselves in such a way that they did not endanger themselves and other road users. The school campus was also observed to see whether they have a simulated Junior Traffic Training Centre (JTTC) for teaching RSE.

The movement of children in and out of the school is controlled by a security guard. The children receive a meal during the school feeding scheme at around eleven o'clock. The school was chosen as the children from the school have to cross the infamous Moloto road when going to and coming from school. Even when they are not going to school, they use the road for a variety of reasons. The road passes through the village. The school is situated in the middle of the village. The children as the main focus of the study were therefore well placed to provide rich data that will help in answering the research question.

As a researcher in the case study I hope to connect to and relate what we already know about road safety as elaborated in Chapter 2, with the findings of the study. This is the role of the researcher as an interpreter in the interpretative paradigm. My objective is to make this new knowledge as clear comprehensible, useful and as objective as possible to others in both within and outside the road safety realm. Stake (1995, p. 99-100) asserts that qualitative researchers operate under the assumption that knowledge is constructed and never discovered. Children construct their understandings of their surroundings from experience and from being told what the world is. Children as the focus of the study are described in depth. This helps to locate them within the study and facilitates our understanding of how they learn. It is against this background that child development is discussed in some detail in Chapters 3 and 4.

4.4 Research process

4.4.1. Introduction

The research process in this case study involved several phases. In this section of the process followed are elaborated on to indicate the path followed, the challenges that were experienced and how these challenges were ameliorated. McMillan and Schumacher (2002, p. 13) note that research is more an interactive process between the researcher and the logic of the problem design, and interpretations. This is true for this study as it involved non-participant observations which involved the researcher observing the activities of the child participants in a natural setting and recording their activities through a digital camera and the writing of notes.

4.4.2. Gaining entry

The provincial Department of Education in Mpumalanga was approached and granted permission for conducting the study. The permission of the school used in the case study was obtained before the commencement of the field work.

The field research was only embarked upon after the university's Ethics Committee approved that field research could be undertaken. The participants' consent was sought for them to take part in the study. Their consent was obtained in writing. The children, parents and teachers were interviewed. In the case of the parents and children, the questions were translated into their home language, Sepedi (Northern Sotho). Children were also observed when using the road when going to and coming from school.

The principal of the school where the case study was conducted allocated a teacher who served as a contact person for me and served as a link between me and the child and teacher participants. With regards to the parents, the teacher took me to the parents who formed part of the participants to get their permission and that of their children to participate in the study. Of the parents who were available no one refused to take part in the study.

Even with this overwhelming support of *carte blanche* from the Mpumalanga Department of Education, the principal, the teachers, children and their parents I was very careful to take into consideration that my entry into the field and support depended on acceptance by all the participants in the study. With this view in mind I spend some days introducing myself and bridging the power relations with the teachers and children in the school and the parents in their dwellings. This was done purposefully on my part to make the participants feel comfortable with my presence in the privacy of their spaces (Robinson & Kellet, 2004, pp. 82-84; Alderson, 2004, pp. 97-98). It was critical to do this with parent participants as they might feel uncomfortable with a stranger in their dwellings – some were makeshift structures (shacks or mekhukhu as they are called). I spent these days discussing the problem of road safety in the village and answering their questions. In this interactions some parents wanted to know whether after this exercise there will be help for their children's education. I explained to them that government offers free education for parents who are unable to pay school fees in school fees paying school.

With regard the non-participant observation method of obtaining data used in the case study I spend days observing child participants and the larger community in their use of roads in the Moloto area including their use of the dangerous Moloto road. The reason for this was to observe the children in their everyday road use to compare this data with their expressions about the use of roads as pedestrians. In this activity the participants were not aware of my presence and existence. I ensured that they do not realise my presence and purpose as this would have compromised my research. I observed the children in the morning when going to school and in the afternoon when they were going home. I repeated the same procedure with the general community. All the data recording was done in the privacy of my car to avoid my activity being exposed or recognised.

In-depth interviews were conducted with the child participants. They were semi-structured and encouraged them to express themselves in a narrative terms and as freely as possible. They were also encouraged to elaborate on RSE issues of importance to them, with the researcher taking or adopting a non-judgemental and self-

affirming approach (see Pattman & Kehily, 2004, p. 132-134). Kellet & Ding (2004, p. 166) point out that the rapport that develops between researcher and child is important for encouraging more forthcoming responses and trust with regard to confidentiality. They proceed to indicate that interviewers who are intimidating or impatient may inhibit children's responses (ibid).

In conclusion my experience in the case study was that gaining access to child participants has its own challenges. There are many gatekeepers (teachers, parents, guardians) who are there to protect children but they can also serve as an impediment by way of silencing them or excluding them. The ethical considerations were adhered to in order to respect people's privacy and the freedom to opt-in or opt-out of the study (see Alderson, 2004, pp. 97-97). The school environment might serve as an impediment where children are not free to talk particularly if they are to make judgement about their teachers. The multiple methods of data collection used were meant to improve on these challenges.

4.4.3 Choosing the site

The choice of the site was influenced by the experience and observation I had when as a road safety practitioner attached to the Department of Transport. I took a group of university students from the University of the Witwatersrand in Johannesburg who were working with a NGO in the field of road safety called *Drive Alive* to the Moloto village and the Moloto primary school, the site of the case study. They performed a sketch on road safety to the children. The interest that the children showed in the road safety messages and their interest in road safety issues persuaded me when I registered for the study with the University of Pretoria to use the school and the Moloto village as the site of the study. The second motivation was the series of accidents that happened in the stretch of road passing through the Moloto village over the years, which made it logical to use the site. I also held the assumption that with these headline-grabbing accidents in the area parents, children and schools would be more conscious of road safety than in other areas where they did not have such problems. Since I was based in Pretoria, which is forty-seven kilometres from the Moloto area, the site of the study and

the notorious accident zone in this area involving public transport vehicles lent themselves to the study.

4.4.4 Selection of the participants for in-depth interviews and mapping of field

Selecting participants for in-depth interviews was influenced by the attributes and profiles of participants who were in a position to yield rich information which would help me in answering the research question. The school was chosen for its location along the busy and accident-ravaged Moloto road. The children and their parents were selected for their potential to yield useful data for the case study. Two classes were chosen to take part in the participatory data collection activities. From all the drawings and written messages from the two classes ten drawings and ten written messages with rich data were chosen and used in the study. Drawings and written messages that helped to answer the research questions were chosen. In choosing the participants for the case study and gaining entry into the field I was mindful that this process requires establishing good relations with all participants (Hedegaard, 2008, p. 202). I was also mindful that research permission is not a guarantee that the participants will behave naturally before a strange outsider who takes notes and pictures and encroaches on their private space. Permission is also not a guarantee that the participants will share their views, perceptions, thoughts and feelings with the researcher (see Hedegaard, 2008, pp. 202-203; Kellet & Ding, 2004, pp. 166-167). The days I spent at the site familiarising myself with the participants and the situation is what McMillan and Schumacher (2002, p. 433) call mapping the field which according to them has the object of acquiring data of the social, spatial, and temporal relationships in the site to gain a sense of the total context. The social map made it possible for me to note and understand the kind of participants who would be taking part in the case study, the socio-economic structure of their village and the activities they engaged in. The spatial map on the other hand enabled me to locate vantage points for non-participant observations, the busy routes people use and to notice the availability or the non-availability of resources provided in the village. A temporal understanding of the village made it possible for me to understand the pattern of life in the village, the schedules and the routines and modes of transport used (see McMillan & Schumacher, 2002, p.

433).In short, this exercise made it possible for me to appreciate the holistic understanding of life in the village and to understand the rhythm of the village and their lifestyles. As road safety is a political, social and economic activity such knowledge of the site was indispensable in the gathering of rich data which was useful in answering the research questions.

My approach in the research with the child participants was informed by Pattman & Kehily (2004, pp. 132-133) who note that understanding the world from the perspective of children and young people involves researchers recognising that it is their respondents who are the "experts". The child participants who participate in the study can be seen as keepers of knowledge and insights that researchers hope to glean. I was therefore mindful of the fact that researching with young people requires or involves what Pattman & Kehily (2004, p. 134) call moments of negotiation, identification and reflection. The child-centred approach of this case study was based on the realisation that for it to succeed it requires that I forge positive personal relationships with them to the extent of becoming accepted by children to the point where they were willing to work with me as the researcher. This involves time, active listening and mutual respect. In short, the role of the researcher is a balancing act in order to cater for the aspirations of all participants (Hedegaard, 2008, p. 204).

Interviewing children requires skill and patience on the part of the researcher. A rapport between the researcher and the children is indispensable. The rapport that develops between the researcher and the children is critical for encouraging more forthcoming responses and trust with regard confidentiality (see Kellet & Ding, 2004, p. 164). As I was exploring the response of children to road safety programmes, I realised that children are the best source of information about this topic which basically concerns them and is about them. Therefore collecting data from them directly was preferred as secondary sources might not have been able to orient themselves to children's perspectives or point of view. To obviate these methodological challenges children were interviewed in their own language, Sepedi (Northern Sotho), and teachers and parents were also used in the case study to complement the child participants' inputs. Teachers and parents were interviewed in Sepedi (Northern Sotho). The teachers used both

Sepedi and English. This ensured that I got rich knowledge as the participants were used to their language preference.

4.4.5 The role of the researcher in the investigation

I acknowledge that the role of the researcher in this study should be that of an impartial and disinterested data gatherer. I steered away from actions that might influence the data generated from the respondents in one way or another. Although I have an education and RSE background, I did not make the participants aware of this, as the knowledge might have influenced the information they felt comfortable to give. In short, I adhered to a high level of self-consciousness which helped to habitually monitor my behaviour and its consequences (Peshkin & Glesne, 1992, p. 35; Stake, 1995). Being an adult researcher in a children's world has its challenges. An obvious challenge is: what role does an adult need to adopt to gain access to the children's world? The power relations if not managed properly can affect the research negatively. In this case study I adopted a realistic approach which is suggested by Mayall (2000) quoted by Kellet & Ding, (2004, p. 169) that the way forward is to invite children to help us to understand their perspective rather than adopt an approach based on pretensions. This approach suited my research with children in a Black village because no amount of pretending would change the power relation between me as an adult and the children. Children are taught from early childhood to respect adults and to regard every adult as a parent. There was just no way would the children regard me as their equal. My role was to create an atmosphere that would enable them to be forthcoming and open up.

As I indicated above the relationship between the researcher and the children has to be one based on trust. It is a relationship where the researcher is an experienced person. I was aware of the possibility that how far the children would let me go would depend on their stage of development (see Hedegaard, 2008, p. 204). I therefore, before the interview, spent some time explaining the purpose of the case study and its theoretical foundation. This helped the child participants to relax before the interview began. I also made them aware that the discussion would be recorded and the recording could be stopped and played back if necessary. The idea was to make them understand that they did not have to recite their answers; they could present them in a narrative and

discussion format. After this explanation the children looked relaxed and ready to help and their participation was enthusiastic. As I was dealing with road safety issues I was perceived from the children's perspective as a traffic law enforcement officer. This conception of me by the children had some influence on their answers.

In the participatory activities, the drawings and writing of road safety messages there was such a strong enthusiasm among the children that I allowed two classes to take part but only selected ten as projects in each class. The selection was based on the quality of the project and the rich content in it. The rich data gleaned from the participatory activities enriched the study immensely and helped in solving the intellectual puzzle.

My relation to the other professionals in the school was to work with the teachers cooperatively. I spent some time interacting with the teachers who were to take part in the study explaining to them the theoretical background to the study and the aim of the study. This gave me the opportunity to reassure them of the confidentiality of the study and how their inputs were to be used (see Hedegaard, 2008, p. 206; Mason, 2002).

In a more structured way my role also included the compiling and administering of the interview schedules with the research participants. One-on-one individual interviews were conducted with all the research participants. Non-participants observations were carried out in the real natural setting. An inductive data analysis was used in this case study which was informed by the patterns, categories and themes that emerged from the data (see Braun & Clarke, 2006). The multiple methods used in the data collection were meant to enhance the trustworthiness of the findings and results of the study.

Children's rights are acknowledged by the UN Convention on the Rights of the Child (Stake, 1995). In view of this I took great care when dealing with the children who took part in the study to ensure that I did not violate their rights in any way (Bayden & Ennew, n.d.). Permission was sought from parents for their children to take part in the study. I was guided by Seaman (1987) who points out that the first right of human subjects is not be harmed physically, psychologically, or emotionally. Other rights include self-determination, privacy, confidentiality, the right to maintain self-respect, the

right to refuse to participate in research or to withdraw from participation without any penalty, and the right to services.

The children participated with informed consent as their parents were provided with the full explanation of the following: The purpose of the project and its general value; All procedures used in the study, with reasons; The children's part in the study; How privacy, confidentiality, and anonymity would be guarded and the manner in which data would be used.

I engaged the children's parents as children fall within a group of vulnerable subjects and they have to be protected. My goal was to develop a fair, clear, and explicit agreement with the children's parents so that the participation of the children became voluntary, and they participated knowingly and intelligently (Heppner *et al.,* 1992, p. 90).

4.4.6 Dealing with ethical questions or considerations

The required ethical considerations for a qualitative research design were adhered to. Permission was sought from all participants and their participation in the study was voluntary. When taking pictures of a class or children permission was sought from teachers. The consent to take part in the study was given in writing. Even when using photographs care was taken to ensure that the pictures were not used to damage the reputation of the participants but for the good course of the study (see Olivier, Wood & de Lange, 2007, p. 19). When pictures were taken during the non-participatory observations, care was taken to ensure that they were used in such a way that they did not compromise the dignity of the participants or people observed. I also worked within the ethical framework required by the University of Pretoria.

4.5   Data collection instruments

The qualitative phases of data collection are interactive research processes that occur in overlapping cycles. A variety of data collection instruments were used as qualitative research encompasses multiple data collection technique (Field & Morse, 1985, p. 65).

Observations, visual methods, drawings and writings and interviews were used in the study. The instruments were chosen for their relevance to the study. They are appropriate to the age of the participants in providing rich information for the study.

I was mindful of the fact that the quality of the research project relies heavily on two skills of the researcher. First is the researcher's ability to obtain information, using both interview and observation methods. Second, perseverance and sensitivity are critical in order to elicit information from the data during the process of analysis (Braun & Clarke, 2006). In the following section I discuss the different instruments. In Table 4.5 all the methods and instruments that were used for the data collection process are described. The table also indicates the type of methods that were used and how the data was captured.

Table 4.1   Instruments used to collect data and the capture of the data

Method of data collection	Type	Instruments assisting data collection	Prompt	Data capturing method: Textual data
Observation	Non-participant observation	Researcher observations	None	Photos from a digital camera; Researcher field notes
Interviews	Individual interviews	Interview schedule with questions	Reassurance that they should feel free to contribute	Tape recorder; Researcher field notes
Interview schedule	Open-ended	Interview schedule	Teachers asked to provide as much information as they could and where they felt they still had more to say, to supplement orally rather than in written form	Questionnaire; Transcription of discussions; Note-taking
Participatory data collection		Drawings	Children given a task to draw the Moloto road with all the aspects that they would like to see on the road to ensure safety	The drawings were submitted to the researcher. All children taking part were given old year planners to draw on

Method of data collection	Type	Instruments assisting data collection	Prompt	Data capturing method: Textual data
		Writing of road safety messages	Children given a task to write road safety messages on A4 sheets or any other piece of paper	Written messages on pieces of paper
Visual images		Pictures	Pictures were taken from the road environment and on the school campus and in the classroom	Pictures were taken during the observations

4.5.1 Observation

Observation, according to Nisbet (in Bell, 1999, p. 156) is not an easy option as it takes practice to get the most out of this technique. However, once mastered, it can often reveal characteristics of groups or individuals that would have been impossible to discover by other means. The observational method relies on the researcher's seeing and hearing things and recording these observations as field notes, rather than relying on subjects' self-reported responses to questions or statements (McMillan & Schumacher, 2001). Qualitative field observations are detailed descriptive recordings as field notes of events, people, actions, and objects in settings (ibid.). In this study I observed the school surroundings to see whether they had JTTC, and the general conduct of children when using the road especially in the mornings and afternoons during peak traffic. The idea was to observe how competent the children were when using the road and to check the road safety skills that they employed when using the roads. The sites for the observations were along the Moloto road and on the roads in the village.

Commenting about the efficacy of observation as a data collection technique, Livesey (n.d., p. 2) says the argument here is that by observing people we can get an insight into the way people actually behave (rather than simply taking it on trust that what people tell us is "the truth" as they believe or remember it). Observation, therefore, gives the researcher a more valid picture of reality.

Non-participant observations were used. Non-participant observation is very effective in the sense that it adds a new dimension to the research process, through the ability to "see for yourself" the behaviour that people describe in an interview or questionnaire. A diary was used for all the data recording (ibid.; Field & Morse, 1985, p. 76-77; Heppner *et al.*, 1992, p. 264).

The advantage of this method was that the presence of the researcher did not influence the behaviour of the people being observed. Pictures and field notes were taken without the people being observed being aware of the process. In an observation process, someone is observing and there is something to observe. Treece and Treece (1986, p. 332-333) list the following as some of the advantages of the observation technique as a method of collecting data:

- It is an important technique for observing human behaviour;

- It is relatively inexpensive;

- All subjects are potential respondents. The researcher does not depend on the respondents for answers;

- Subjects are usually available;

- It is ideal for using tape recorders and cameras;

- It is very simple to develop;

- It gives the researcher the opportunity to view the situation at first hand;

- It can be begun and stopped at any time;

- Events are recorded as they happen;

- It can be recorded by any person other than the researcher.

The technique assisted me to observe the children in a situation where they would behave as children without the interference of adults (Cosby, 1989, p. 48). The people in the community became participants in the real setting. I was able to take pictures as I saw fit and select as many scenes as I could without the children being aware of it. My observation was therefore neutral; it did not influence the children as they were not aware of the activity.

I personally controlled the process of observation from beginning to end. I observed the situation at first hand. I chose areas that were critical for me for observing the extent of the road safety skills of the children. The observation took place for a period of two weeks. The first week was dedicated to observation only. I observed both the children and other community members in their use of the roads in the Moloto area particularly in their use of the roads in the village and the Busy Moloto road. I observed children in the morning when they were going to school and after school when they were going home. As I used the non-participatory approach the people were not aware that they were being observed. I used a digital camera to capture data or events observed and also wrote notes to document my observations. During the observation I was mindful of the ethical considerations pertaining to observations and ensured that whatever I captured did not compromise the safety and dignity of the participants. In all my observations I ensured that the participants were not aware of my presence as this would have compromised my data gathering process.

4.5.2 The use of visual tools and methods

Galvaan (2007, p. 153) points out that visual images present a powerful collection of techniques to assess and gain insight into people's lives and environments. My study lent itself to the use of photography in data collection as I had to observe people or child participants using the road in a real situation the way they would use it in their daily lives. This offered me the real representations of child and adults as they use the road in their everyday life compared to their experiences on their road use behaviour (see Rose, 2007, p. 2). In this regard Ebersöhn and Eloff (2007, p. 203) state that photographs offer the distinctive quality of visually affording the researcher a perspective of a phenomenon often vastly differing from and enriching written and verbal accounts. Ebersöhn and Eloff (2007. p. 203) add that "differing" or different and diverse accounts, perspectives and views therefore enrich and substantiate a study's evidence base (see also Tambo, 2010). The power of visual images helps to form a concrete image in the mind of the reader and to come to a holistic understanding of the phenomenon under study (see Mail & Guardian, 2010, p. 4; Gqola, 2010).

My use of photography or pictures was influenced also by the nature of my work as a road safety practitioner and educator where we are required to capture accident scenes through photography for future reference or to use as evidence for documentation and police purposes. The power of pictures in qualitative research cannot be overemphasised. The researcher cannot take from or add to a visual image but can only offer an interpretation. Mixing methods and using visual methodologies like photographs is a way of widening the empirical focus of a research project (see Rose, 2007.p.2000). In post-modern societies characterised by the proliferation of visual technologies like film, cameras, movies, TV programmes, and newspaper pictures, the construction of the reality that we see is based on pictures. Jenkins (1995, pp. 1-2) quoted in Rose (2007, p. 3) concludes that "the modern world is very much a 'seen' phenomenon". Thus, seeing is believing! The use of photography as a data collection tool lends itself to a social research design as I already indicated as it deals with human realities (Ebersöhn & Eloff, 2007, p. 204; Rose, 2007, p. 3; Olivier, Wood & De Lange, 2009, p. 14).

4.5.3 Advantages of using photography

Photo voice or the use of photography is becoming a popular qualitative tool for data collection (Olivier, Wood & De Lange, 2007, p. 15-16; De Lange, Mitchell & Stuart, 2007. pp. 1-5; Rose, 2007, p. 3-5). A picture does not lie (see Mail & Guardian, 2010, p 4). There is no other method of depicting reality than a photograph (Ebersöhn & Eloff, 2007). From an academic and research perspective it demonstrates that the researcher was at the site of the action and has actually observed the phenomenon under study. Photography as data collection methods enables the researcher to use the camera magic to capture the reality as it unfolded in a natural setting. This opportunity therefore provides the researcher with some kind of lived experience as he experienced the reality unfolding first hand. The product of this process i.e the picture or photo offers the researcher a sense of security and control of the data as the photos or pictures could be there for posterity.

Observing and taking pictures of a scene or an event unfolding with the research participants while using the road as the normally would drew me as a road safety practitioner emotionally into the private spaces of the research participants. This data

collection method made it possible for me to capture the setting of the study – a rural environment bereft of resources. The pictures provided the evidence and the trail of this setting without my having to describe it secondhand. The evidence and background setting is there for everybody to see. The rurality of the setting is depicted on the photographs.

The significance of the use of photography for this study was the unintrusive nature of the way the photographs were taken. The non-participant observation method was used. As discussed in section 4.4.2 the research participants were not aware that they were under observation and photographed. As a result, the authenticity of the photograph and the data it provides is beyond reproach. It cannot be doubted. Photographs are used in the study as part of the audit trail – documenting and illustrating the research process for the study.

The choice of the methodology was also influenced by the fact that in South Africa, by and large, the university is an urban institution and the use of photography made it possible for me to bring the rural setting of the case study to my supervisor so that she could have a holistic picture of the site of the case study. This might have helped her to navigate through the data analysis process with an appreciation of the setting of the case study. In short, photography made it possible for me to bring a rural reality to an urban setting (see Ebersöhn & Eloff, 2007, p. 216). In conclusion, the inclusion of photographs in my study apart from intensifying the academic rigour of the study made it possible for me to facilitate the understanding of the study by any reader of the field of road safety which might not be their field of expertise. Prinsloo (2007, p. 128) cites an aspect that is critical to this study and road safety by indicating that visual methods as a research tool can provide the opportunity to go beyond just answering the research puzzle to include a process of intervention to improve the situation revealed by the research (see also Moletsane & Mitchell, 2007, p. 132). Above all, photographs can be used as the framework and the basis for policy formulation with a view to social change, as Pithouse and Mitchell (2007, p. 141) point out (see Galvaan, 2007.p. 152).

4.5.4 Disadvantages of photography as a data collection method

The use of photography as a data gathering method presented ethical challenges or dilemmas for me as the researcher as the power relations were stacked in my favour. However, as I used the non-participatory observation I mitigated the situation by the fact that the participants were not aware that they were being observed and photographed. I did the observation, photographing and note taking in the car which I ensured was parked at a distance. I ensured that my presence was never felt or observed, to prevent people from realising that there was an intruder or feeling that their privacy was invaded.

The difficulty of analysing photographic data is that one photo could present different categories thus lending itself to different interpretations (see Tambo, 2010, p. 20; Gqola, 2010, p. 10). This leads to the temptation to use one photograph more than once for different categories. The risk of being immersed in the unfolding scenario or phenomenon is high. Too many pictures present both advantages and disadvantages: the dilemma being which picture is most appropriate and which one is not.

4.5.5 The use of participatory methods

In order to ensure that I obtained rich data and improved the validity and reliability of the data, other instruments were used to complement the observation and the interviews. A diversity of data sources is preferred in qualitative research to increase the validity of the data (Treece & Treece, 1986, p. 370; McMillan & Schumacher, 2002, p. 185). I used drawings from the children and written messages. With regard to the drawings, children were requested to draw or design the Moloto road in the way they would like to see it. The purpose of this participatory data collection task was to see what road safety features the children would include in the road design to ensure the safety of pedestrians and other road users. However, the focus was on pedestrians as the children were mostly pedestrians.

Drawings were used in this study as a data gathering tool. The rationale was to attempt to give the child participants a voice or tool to provide a visual representation of an ideal road with the necessary road safety infrastructure or furniture which would be safe for them to use as pedestrians. For this study the participatory methods are critical in the

sense that the research is child-centred and the focus is on the children. Their voice has to be heard rather than other people either as parents or guardians speaking for them. The bulk of the data used has to come from children. I was influenced by the imperative that the knowledge that emerged from the study had to be produced by the children themselves. In this regard I was influenced by Oliver, Wood and de Lange (I2007, p. 15) who assert that participatory methods like the drawing exercise used in this study facilitate the process of knowledge production as opposed to knowledge gathering as is the case with other methods like interviews or surveys. Data gathered through participatory methods is first-hand data which enhances the trustworthiness of the study and the findings.

The rural setting also influenced the choice of this method of using drawings. Barnes and Kelly (2007, p. 221) point out that the use of this technique within the visual methodologies is economical, requiring minimal supplies and it is highly generative in nature. In this case study I only supplied the children with old year planners that were lying unused at my place of employment. As indicated above the rationale for the use of the drawings was to give the rural child participants an opportunity to conceptualise an ideal Moloto road instead of the dangerous road actually passing through the village. The purpose was to encourage what Walker (2001) quoted in Barnes and Kelly (2007, p. 222) calls free imagination. The brief for the child participants was: "To draw the Moloto road as they would like to see it".

In the context of the study the participatory drawing exercise was meant to provide the researcher with a window on how the child participants saw themselves in their respective rural spaces characterised by the inherent danger on the roads and their hopes for safer roads (see Barnes & Kelly, 2007. p. 223). The drawings from the child participants validated the data from the interviews and provided insights into unexplored areas during the interviews (see Stuart, 2007.p.229). On the part of child participants this data collection method gave the child participants control over what they wanted to say. Still in this participatory activity child participants were asked to write a short description of their drawings. The purpose was to ensure that chances of

misinterpretation were minimised during the interpretation and analysis of the drawings or visual images.

The advantages of this method in the context of the study was that it gave the child participants an opportunity to focus on their experiences and their exposure to danger on the roads, and to express their feelings and attitudes towards road safety education. This method provided a platform for child-centred assessment of the roads in the Moloto village. For child participants who were dealing with an outsider this method is unthreatening; they could do the drawing in their own time and space without any pressure. Besides, it is fun for the child participants to find an opportunity to draw. It was taken into account that the children would draw generalised pictures, but this was intended because I wanted as much information as possible (see Toomela, 2006; Gobo, 2005).

Another instrument I used to assess the children's repertoire of road safety messages was to request them to write a list of road safety messages as part of participatory data collection. Each participant was encouraged to work alone, but working in pairs was not discouraged. This activity assisted me in evaluating the extent to which the children were receiving road safety messages from outside the school, from the mass media – either radio or television. This also assisted in analysing the patterns that emerged from the common messages that the children provided. Table 4.6 illustrates the instruments used in data collection, their limitations and how they enriched validity. These messages were juxtaposed with the drawings to see if patterns emerge. Just like the drawing method this method (Writing messages) allowed the child participants to express themselves in the comfort of their own spaces without any pressure from the researcher. I gave each one half an A4 page to write road safety messages that they regarded as important to them.

4.6   Interviews

Monash (2004, p. 1) defines an interview as a method where on a one-on-one basis, the researcher attempts to collect data from the interviewee using open questions, semi-structured questions or structured questions (or a combination of all three).The

interview is focused upon the interviewee in the sense that the interviewer's own views on the topic are not particularly important. The views, knowledge and other input of the interviewee comprise the primary data for the research.

The interview was used as one of the data collection techniques in this study. It was preferred because of its potential to enable the researcher to source relevant information and to enhance the study's chances of attaining its set objectives. The flaws of interviewing as a data collection technique are outweighed by its advantages. It permits the researcher to follow up leads and thus obtain more data and greater clarity. The interview situation usually permits much greater depth than the other methods of collecting data (Borg & Gall, 1989, p. 446). The interview was used to complement observation, the other data collection techniques used in the study. Individual or one-on-one interviews were conducted. The interview schedules are provided as Appendix B.

The semi-structured interview is an interview whereby the focus of the interview is decided by the researcher and there may be particular areas that the researcher is interested in exploring. This technique uses both closed and open-ended questions. The basic objective of a semi-structured or focused interview, therefore, is to understand the respondent's point of view – how and why they do things for example – rather than to make generalisations about people's behaviour (although this may be possible). As such it is a technique that involves the extensive use of open-ended questions, some of which are suggested by the researcher and some of which arise quite naturally during the course of the interview (Livesey, n.d., p. 2). The interview enables the researcher to gain explanations and information on material that is not directly accessible, such as perceptions, attitudes and values, which are difficult to obtain by alternative methods Heppner *et al.,* 1992).

Semi-structured interviews were conducted with the research participants in order to get their perceptions, opinions, and attitudes regarding the teaching of road safety in schools and communities. For the purposes of this study, the semi-structured technique was preferred and appropriate, because questions are normally specified, but the interviewer nevertheless has more freedom to probe beyond the answers in a manner which would appear prejudicial to the aims of standardisation and comparability.

Information about age, sex, occupation, type of household, and so on can be asked in a standardised format. Qualitative information about the topic can then be recorded by the interviewer who can seek both clarification of and elaboration on the answers given. This provides the interviewer with greater latitude for probing beyond the answers and entering into a dialogue with the interviewee (May, 1993, p. 111; Bell, 1999, pp. 135-143; Robson, 1993, pp. 227-242).

A semi-structured interview contains both open and closed questions. I used this form of interview with the child participants. The semi-structured interview allowed me to ask a few specific questions but beyond that I was free to probe as I saw fit, guided by the responses from the participants (Treece & Treece, 1986, p. 300). I recorded the responses and took notes where necessary. Working with both transcriptions and notes ensures that nothing has been missed.

Unstructured or in-depth interviews (also called the open-ended interview) were conducted with parents and teachers in this study because this method provides qualitative depth by allowing interviewees to talk about the subject in terms of their own frames of reference (ibid., p. 113). This technique distinguishes itself from the semi-structured interview in the sense that the interviewer works from a list of general topics but has greater freedom to explore areas of interest. It permits full exploration of ideas and beliefs, and is therefore a more valid account of social life.

I used this form of interview as I was exploring new territory or information with the parents. The advantage of this form of interviewing is that as the process of exploration develops, the interview may be directed by the informant's responses into previously unanticipated areas (Field & Morse, 1985, p. 65). I had a set of questions that guided the interviews with the parents but if new information emerged I pursued it to get more clarity and a clear perspective. I recorded the responses using a tape recorder and also took notes. This was helpful as most parents could not write beyond their names and surnames and it enabled me to get data that helped me in understanding the factors facing children in learning road safety skills and the role of their parents in this process.

Ten interviews were done with ten child participants. This was followed by ten interviews with the parents of the child participants. These were all one-on-one individual interviews. Two teachers who teach LO which encompasses the road safety competencies were also interviewed.

The interviews with the child participants and the teachers were conducted in my car parked on the premises of the school. This was done to avoid distractions and the background noise which was interfering with the recording of the interviews. I would call them one after the other when each had finished with the interviews. This ensured that there was minimum disruption of the school programme. The use of the car was because there was no spare room that could be used for the interviews. In the primary school all the classes were occupied. The school premises were being used by high school students and the new primary school was being built to relocate the Moloto primary school. The administration block of the Moloto primary school and 80% of the classes were allocated to the secondary school which was relocating from their terrapin premises. I therefore had to use the car as there was no room to be allocated to me. When I initially went to seek permission it was still the primary school and there was a spare room in the administration block and I was allocated the room that I was to use. When I went to do the actual research, the situation had changed and became more challenging. Hence I had to use my car.

The lower grades had relocated to the new primary school premises but what I observed was that the teachers who were still at the old school which has been allocated to the secondary school were not happy because their offices were occupied by the teachers from the secondary school. This meant that they were using the classes as offices as well. The new arrangement inconvenienced the primary school teachers as there was an acute shortage of space and the classes had large numbers of children. On overage each class had sixty children. I assured my facilitating teacher and the principal that I would use my car for the interviews.

The use of the car was a challenge for me as I also had to write notes and it was no convenient to write notes in the car. But I had to make do. With the interview with the parents I went to their houses and some were selling food at the school gates along the

street. The challenge here was that there were no chairs for me particularly from parents who were hawkers near the schools. I would sit in the wheelbarrows which they used to cart the food articles that they were selling mainly to the school children. All the logistical problems notwithstanding the parents respected me. I think this was due to the fact that I dressed like the teachers as I was to work from the school. Their construction and perception of me was that I was a very "important person from government". My explanation of my background and the purpose of what I was doing underpinned their construction of me as an "important person from government".

The children's interview schedule consisted of four sections, A to D. Section A sought biographical information of the child participants. Section B sought information about the inputs that child participants received at home from parents regarding. Section C sought to establish the road safety competencies that the child participants were receiving form the school environment. Section D focused on what road safety inputs the child participants were receiving from the broader community.

The interview schedule for parents focused on the role that they played in the RSE of their children. It also sought to establish their parents' views and attitude to RSE particularly as it pertained to their children. The teacher interview schedule on the other hand focused on establishing their experience and competence in teaching road safety competences as outlined in the curriculum, the teaching aids they needed to teach the road safety competencies effectively and the used they were using in teaching RSE (see Appendix B).

The teachers completed the questionnaires in English, and while they were doing so, I conducted interviews with them. My presence enabled them to ask me for clarification of questions and in turn I asked them questions about the answers they provided. This strategy had advantages. The teachers could ask me not only what they did not understand but also ask follow-up questions. I recorded the discussions I had with them. The recordings were characterised by long pauses, as where they understood the questions they would write in silence.

I was well aware of the strengths and weaknesses of the various instruments used, which is why I used various instruments to complement or triangulate the data. To maximise data from the participants the interview schedules consisted of both closed and open questions (see Bayat, 2007, p. 89). In my attempt to gather rich data I addressed the limitations of each instrument to increase its validity.

Table 4.2   Instruments used to collect data, limitations of each instrument and the enhancement of the validity of the study

Instrument assisting data collection	Limitation	Enhancement of validity
Observation	Children do not necessarily behave in a predictable way. It requires a great amount of patience from the researcher.	It happened in the actual setting and children were not aware of the process. The data captured was authentic.
Interviews	Participants get carried away telling the researcher what they think he wants to hear. Participants want to show how much they know about the subject, not necessarily responding to the question.	It gave me the opportunity to control the process and direct the interview by constructing the interview schedule.
Questionnaire	Misunderstanding the questions occurred frequently without the respondents making the researcher aware.	The questionnaire enabled me to follow up where information was scanty as a result of misunderstanding the question and to offer clarity where the respondents were not sure.
Drawings	There is always a danger of misinterpreting the message of a picture.	It provided the opportunity for me to assess the understanding of road safety among children, what they wanted for improving the safety of pedestrians; the road safety features that they want on the Moloto road to improve safety along the road.
Road safety messages	They might have memorised the road safety messages without understanding and internalisation of the meaning thereof.	It offered the opportunity to evaluate their knowledge of road safety – what they knew and what not.

4.7   Data analysis

Data analysis in this study is based on a descriptive framework. Possible answers to research questions were organised, selected, described, analysed and interpreted (Robson, 1993, p. 378). Maykut and Morehouse (1994, p. 121) point out that the process of qualitative data analysis takes many forms, but is fundamentally a non-mathematical analytical procedure that involves examining of people's words and actions. Qualitative research findings are inductively derived from this data. The idea is to understand more about a phenomenon under study. Writers like Belenky (quoted by Maykut & Morehouse, 1994, p. 122) refer to this approach as "interpretative-descriptive" (McMillan & Schumacher, 2001, p. 463).

In order to understand the participants' actions the use of observation, visual images, participatory methods and interviews in data collection were key in this research study. Photographs have the power to provide an element of trustworthiness and reliability. For this research study photographs were used as a medium to provide the rural setting of the site of the case study. In analysing the photographs the method I used was informed by my perspective of children as active participants in meaning making or the construction of reality and as opposed to a perspective that sees children as passive souls who have to be protected and guarded (Fraser *et al.*, 2004. p. 85; Olivier, Wood & De Lange, 2009, p. 14). To understand the meaning and realities depicted by the photographs I move from the premise that no picture stands in isolation (Prinsloo, 2007, p. 121-122). A holistic approach informed by the context, setting and culture was the framework for the analysis of the photographs. The pictures used in this study serve as a societal commentary and serve as a window to the cultural practices of the community they come from (see Moletsane & Mitchell, 2007, p. 131).

The repertoire of photographs taken during the two-week observation period was grouped according to category of children or adults. Once this has been done all photographs were evaluated in relation to the intellectual puzzle. They had to answer the question: How is the action depicted helping to solve the intellectual puzzle? i.e., how is the photograph showing the response of children to road safety programmes? These visual representations were then categorised according to the themes that

emerged from the other data collection methods (Braun & Clarke, 2006). The most relevant photographs were used. The visual images were used as both the primary data and additional data to triangulate the textual data in order to enhance the academic rigour (Galvaan, 2007, p. 153). Although the photographs are an important part of the study their position in the study was to support and triangulate the textual data.

The photographs were analysed using the inductive analysis in that there were evaluated and pigeonholed to the themes that they were relevant to emanating from the textual data. This was done in line with the way there were helping to solve the research question or the intellectual puzzle. Although the child participants were not involved in the analysis of the visual images I moved from the premise that acknowledged the children's significant contributions as social and cultural actors.

When interpreting the photographs the object was not to make a moral judgement but to find reasons that could be behind the behaviour of the child participant and parents within the setting. To the study this was critical because I had to find out whether the environment or setting accounted for the behaviour of the participants or not. Photographs were chosen on the rich data they provided and their representativity (see Moletsane & Mitchell, 2007, p. 133).The triangulation of the data analysis was also strengthened by the use of the participatory methods like the use of photographs.

In order to give child participants a voice, the participatory methods used were the drawings and the road safety messages by the child participants. The strength of these participatory methods is that they are not threatening and child participants can work at their own pace. The drawings as a participatory method gave the child participants free imagination and creativity. For the research it served as a window into the mind of the child participants. I was able to analyse the child participants' thinking regarding road safety using their drawings. The analysis of the drawings was based on the content or information they contained in relation to answering the research question. The first step in the analysis was to assess the drawing for information relevant to the research question. The drawings were then categorised and coded and then described to look at similarities. From the descriptive data from the drawings themes developed and were discussed in relation to how they help in understanding the intellectual puzzle (see

Rose, 2007, p. 61-64). Rather than follow a particular approach to visual analysis a holistic approach was followed were any bit of information was considered in analysing the drawings. To enhance understanding and minimise subjectivity the descriptive notes attached to the pictures were also considered and formed part of the analysis (See Rose, 2007, p. 141; Olivier, Wood & De Lange, 2009, pp. 15-16). In this approach I was inspired by Berger (1972) quoted in Rose (2007, p. 8) who calls this holistic visual assessment as ways of seeing, referring to the fact that "we never look just at one thing; we are always looking at the relation between things". In interpreting the drawings I was mindful that one picture could be interpreted from different perspectives (see Prinsloo, 2007; Rose, 2007, p. 7). As a result, I used the framework below to guide the analysis of the drawings.

Framework used to guide the analysis of the drawings.

What messages are depicted on the drawing?
What is the significance of the messages depicted in relation to the research question?
What motivated the child to draw this picture?
Why are the messages depicted on the drawing so important to the child?
Are there similar messages depicted in the other drawings?

Once a narrative has been developed from this framework I highlighted the themes that emerged and proceeded to do the thematic analysis in Chapter 5. Using the constant comparison approach the drawings were juxtaposed and compared with the other visual medium; the photographs. This yielded rich data which could not have been obtained using any other method. These visual data was then used to analyse and strengthen the thematic narrative discussed in Chapter 5. The drawings and the photographs were analysed to illustrate the themes discussed.

The other participatory technique used was the writing of road safety messages. This was used to assess the road safety messages that child participants know and their thinking about RSE. In the choice of the participatory activity of child participants drawing road safety messages I was influenced by the constructivist approach where

participants actively construct their own knowledge of road safety (see Lesley, Wood & De Lange, 2007, p. 15). The object was to give the child participants an opportunity to create road safety messages from their own perspective. Intellectually this offered me an opportunity to assess the programmes that had influence on the child participants as most messages came from the Department of Transport's road safety programme called *Arrive Alive* through mass media like Radio TV and the print media.

The messages were transcribed on an A5 sheet of paper according to categories. On the second level the narratives that emerged were explored further to look at common occurrences and emerging patterns in the messages. The third level was to contextualise the messages in relation to the study by arranging the narratives according to the themes that emerged. The children's road safety messages were used unedited in the study in Chapter 5 to maintain their originality and immediacy. As this is a qualitative research the use of the messages in their original form contributed to enhance the reliability and validity of the study (Olivier, Wood & De Lange, 2007. p. 19; Braun & Clarke, 2006.).The road safety messages were then used as part of the narrative in the study to argue evidentially, interpretively or narratively, evocatively and reflexively (see Mason, 2002, pp. 176-177). Common messages were categorised to identify the core concepts and to see the patterns that emerged. In the analysis the messages are discussed unedited to retain their originality and authenticity. Although the child participants use English as a second language they wrote most of their messages in English. In some instances the messages might have been translated in brackets for clarity. In the study the messages are used to present an argument for the themes that are discussed. They form part of the triangulation of the data collected. While the visual data provided an opportunity to understand the actions of the participant the written messages provided an opportunity to understand the words of the child participants.

The constant comparative method of categorising and coding data was used in this study in order to develop a set of categories that will provide a reasonable reconstruction of the data collected (Lincoln & Guba, 1985, p. 347). The prepositional rule approach was used to cluster the coded information that fell within one theme.

I followed the immersion/crystallisation style which collapses segmenting, categorising and pattern seeking into an extensive period of intuition-rich immersion within data. This entailed questioning and analysing the data for subtle nuances of meanings and patterns in the data. By and large, because the study was a qualitative study, I leaned towards the interpretivist method of analysing the data (McMillan & Schumacher, 2001, p. 263). In organising and analysing the data I needed to answer the question of what count as data or evidence in relation to my research question. In other words, I used the data that helped me answer my research question (see Mason, 2002, p. 148). In the process of data analysis the data collected through interviews and the participatory methods and the photographs were analysed.

4.8   Validity and reliability

Validity refers to the degree to which the explanations of phenomena match the realities of the world. It includes both internal (causal) and external (generalisability) inferences and issues of objectivity and reliability. The validity of qualitative designs is the degree to which the interpretations and concepts have mutual meaning between the participants and the researcher (McMillan & Schumacher, 2001, p. 407; Stake, 1995, p. 107-109).

The triangulation of the methods that I used to collect data like interviews and observations enhanced the validity, trustworthiness and reliability of the findings in this study. I used a variety of methods and instruments to broaden the data capturing process which provide "thick" data. The observation was unobtrusive and provided an authentic data set in an actual setting, where the children where captured on camera. In qualitative research, the protocols followed to improve the validity of data are called triangulation.

This aspect of data triangulation was informed by the observation of children at different times of the day, when going to school or after school. I also observed them during non-school days to see whether they would behave in the same way even when they were not in a hurry on their way to school or from school. The idea was to improve the credence of my data gathered when observing the children under different

circumstances. Another protocol I followed to improve the credibility of my data was methodological triangulation. I compared data gathered from the observation with data obtained from teachers, parents and children to determine whether there were similar observations or whether their observations corroborated what I observed. This is also called investigator triangulation (Stake, 1995, p. 113). I used it to confirm whether the teachers as investigators had observed aspects similar to what I observed.

In addition, the limitations of this study are clearly detailed to indicate what I was able to do. Glesne and Peshkin (1992, p. 147) assert that continual alertness to your own biases, your own subjectivity, assists in producing more trustworthy interpretations.

In qualitative research the validity and reliability involves conducting the study in a highly ethical manner. The research in this study adhered to the ethical requirements as stipulated and required by the University of Pretoria (2009). Although qualitative research is not meant for generalisation, valid and reliable findings can help "assess local events accurately, to improve short-run control", provide perspective rather than truth, empirical assessment of local decision makers' theories of action rather than generation and verification of universal theories, and context-bound extrapolations rather than generalisations (Cronbach quoted in Merriam, 1998; Patton, 1990, p. 491).

In a quest to improve the validity and reliability of the results triangulation was used in a form of different methods for data collection i.e observations, visual images, participatory methods and interviews when comparing the findings of each. The purpose was also to use the different methods to complement each other. The combination of both participatory methods and interviews ensured that rich data was obtained during the data collection. The use of multi-method was informed by the understanding that multiple strategies yield different insights about the topic under study and increase the credibility of the findings (McMillan & Schumacher, 2001, p. 408). Although multiple methods were used for data collection the in-depth interviews were the central method while the participatory methods were complementing the interviews.

The interview schedules used in the study are attached as part of the audit trail in the addendum. Chapter 5 discuses the data and provides the evidence of the data collected

as part of the audit trail. The drawings, the photographs are used to support the thematic narratives. The written road safety messages have been typed but retained in their original form to maintain their authenticity and trustworthiness.

Multiple data sources were used. Child participants were used as key source of data as the focus of the study is on child participants. However, in order to get a rich data to help in the answering of the research data parents and teachers were used as secondary sources of data. The research question was then answered from data sourced from three perspectives.

The study employed the interpretative design that followed a hermeneutic cycle whereby what was learned in the field was based on what was already known to a certain extent as a result of the literature review as analysed in Chapters 2 and 3 and the experience of the researcher in the field of RSE, since 2002.

4.9   Ethical considerations

Research ethics requires that willing unpressured consent should be sought before research commences (Alderson, 2004, p. 97). Ethical guidelines in research cover aspects such as informed consent, deception, confidentiality, anonymity, harm to subjects and privacy (McMillan & Schumacher, 2001, pp. 420-421). Cassell and Jacobs (quoted by Glesne & Peshkin, 1992, p. 110) observe that a code is concerned with aspirations as well as avoidance. It represents our desire and attempt to respect the rights of others, fulfil obligations, avoid harm and augment benefits to those we interact with. Punch (1986) puts it aptly when he says research codes of ethics address individual rights to dignity, privacy, and confidentiality, and avoidance of harm.

Treece and Treece (1986, p. 128) have classified research procedures into five categories looking at the effect of participants. They are: no effect, temporary discomfort, unusual levels of temporary discomfort, risk of permanent damage and certainty of permanent damage.

My study fell under the no effect category (see documentation in Appendix B). In this category there is neither positive nor negative effect on the participants. The approach I

used with these children was that I took them as human beings with rights that are accorded to every human being. I did not treat or regard them as "human becomings" (Boyden & Ennew, n.d., p. 36; Cosby, 1989, pp. 187-189). As the study is a participatory research I was mindful of finding ways that would enable expression of children's ideas and perceptions, for instance by using an interview with the children so that they could express themselves in their own languages without hindrance. I considered the power relations between me and them by assuring them that they should feel free and behave as in any normal situation.

In pursued of the principle of 'good' research this study was underpinned by the following ethical frameworks: the principles of respect and justice concerning doing 'good' research because it is the right, correct thing to do, such as respecting children as sensitive dignified human beings and trying to be fair and considerate. Rights based research involves respecting the rights of children. Participation rights that are vital during ethical research include children being well informed and having their own views being respected and listened to by the researcher (Robinson & Kellet, 2004,pp.81-85;Pattman & Kehily, 2004, p.134. In rights based research the researcher listens to children and their views on what is 'good' research rather than relying wholly on adults' principles and values. Lastly, best outcomes ethics means working out how to avoid or reduce harm and to promote benefits (see Alderson, 2004, p. 98). In this study I strove not to embarrass, harm or prejudice the participants in any way.

4.10   Expected limitations of the study

Road safety has been included as part of the mainstream curriculum according to the National Curriculum Statement (Department of Education, 2002). The capacity of teachers to teach road safety competencies at the primary school level might be hampering the teaching of these competencies. One limitation of a case study is that the single case selected might not be representative for the whole of South African schools. Generalisations made from a single case study may also be questioned (Treece & Treece, 1986, pp. 199-200). I therefore described the case in depth for possible applicability. In the literature review of Chapter 3 I did not fully study the teaching of RSE but concentrated more on the children's learning of RSE and the

teachers' response to their own teaching. Another limitation was that I became involved with the participants so it became difficult to remain objective.

The low level of literacy amongst the parents in the study posed an inhibiting factor in getting rich and relevant data. People who had been identified to participate in the study were no longer available. This posed a dilemma as new participants had to be found. The lack of generalisability in a case study notwithstanding, this study gives an understanding of how RSE, including road safety skills and safe pedestrian behaviour, is taught and the response of children to such teaching.

4.11   Conclusion

In this chapter I discussed the methods and instruments that I used to collect the data and the possible limitations of these methods and instruments. I also discussed how I attempted to improve the validity and reliability of the data collected by using instruments that complement each other. The choice of the criteria used to analyse the drawings was also influenced by the need to improve the validity and reliability of the data collected through the drawings. The various methods were chosen for their suitability for the study. In Chapter 5 I discuss the data analysis and results of my exploration of the data.