Chapter 5

5. Discussion

5.1. Introduction

This chapter examines the importance of considering the specific social and cultural setting within which psychological development takes place. The complex socio-cultural setting of Venda schooling is examined, with specific reference to its evolving schooling and cultural traditions. The study further examines how the present practices of schooling and classroom teaching and learning were influenced and shaped by the specific culture and history of Venda schooling and society. Teachers and pupils are considered to embody the culture and history of their schooling and society, which they enact as they engage in the classroom practices of teaching and learning. The historical practices of schooling and society change, at the same time that they are continued, in the "here and now" of classroom teaching and learning. This view is consistent with the Vygotskian (1978; 1962) conception of psychological development as arising from the practices of culture and society. A consideration of these practices as they evolve provides an understanding of the regularities that the cultural context of schooling presents to learners' and teachers' practices and their consequent psychological processes.

The present study was conducted at a period of major historical significance in South African society. South Africa was undergoing far reaching societal and political changes from the apartheid system to a democratic society. The apartheid political system had denied political and economic freedom to the Black population. The opportunities available to Black people during the apartheid system were limited and their schooling was inadequate. The post-apartheid dispensation was faced with the challenge of transforming society and its institutions. The system of schooling, for example, had to be completely restructured. New laws and policies were put in place to ensure that the

provision and practice of schooling changed in accordance with the new political dispensation.

The current study investigated, through the consideration of classroom teaching and learning, the development of new modes of thinking and concepts arising from the post-apartheid, Outcomes Based Education, curriculum. A consideration of the new curriculum and the socio-cultural context of its manifestation are crucial for understanding evolving practices of classroom teaching and learning. The post-apartheid political imperatives for educational transformation are underpinned by, for example, principles of redress, access, equity and social development (Chisholm et al. 2000).

The present study examined the teachers' and pupils' practices in the classroom as instantiations of complex and irreducible socio-cultural and historical processes. The results of the experimental tasks presented in Chapter 3 revealed the combined effects of the children's schooling and their everyday, spontaneous learning in their culture and society. The performance of the pupils who participated in the experimental tasks revealed that language plays a crucial role in the organisation of thinking during problem-solving situations. The task performance reported in Chapter 3 revealed that Venda children's development is equivalent to their counterparts in other societies and their acquisition of formal concepts is generally consistent with theoretical accounts of the age range at which other children acquire formal concepts. However, the responses of these children to the tasks and their strategies for solving the tasks' problems also revealed the influence of their peculiar schooling and cultural-linguistic context of learning and development. The children's emphasis on concrete, empirical, and experiential modes of problem solving and thinking in their performance on the experiments is congruent with their general approach to classroom learning and their teachers' emphasis on the concrete and empirical relational systems of knowledge, inadequate for transcending the culturally mediated, concrete and empirical knowledge systems. Classroom observations revealed that the practices of classroom teaching and learning and their psychological consequences in Venda schooling are going through fundamental transformation. However, simultaneous with these changes, the practices

of culture and past schooling continue to be reproduced, leading to multifaceted and complex developmental outcomes.

The present chapter examines the relationship between the schooling context of Venda children and their present, post-apartheid practices of schooling and classroom teaching and learning. The context of Venda schooling is again highlighted in the discussion of the cultural context of schooling below to emphasise the cultural-historical aspect of development. The significance of this context is assumed to be in the tension between the cultural practices of society and schooling on the one hand and the view of the present, Socio-cultural theory that effective practices of schooling and classroom teaching and learning should comprise the transformation of pupils' existing, culturally shaped and everyday, spontaneous knowledge systems and concepts. The tension is revealed between the specific practices of culture on the one hand and the practices of schooling and classroom teaching and learning on the other hand.

The performance on the experimental tasks and the present practices of classroom teaching and learning highlight the inadequacies of the Venda children's schooling and its practices of classroom teaching and learning. The inadequacies that characterised classroom teaching and learning could be accounted for by the specific, culturally derived mediational processes peculiar to the present schooling system. Rather than generating abstract and theoretical relational systems of knowledge, the mediational processes emphasized the concrete, empirical systems of knowledge and learning. This discussion is carried out further in the section on scientific versus spontaneous concepts and in the section that deals with the distinction between the theoretical and the empirical 'methods'. These are major themes in the present discussion and they eventually lead to the proposal for the integration into the schooling system of Vygotsky's concept of the zone of proximal development (ZPD) (Vygotsky, 1978). The application of the concept of the ZPD is capable of addressing the difficulties that the teachers experienced with regard to transforming their pupils' everyday, spontaneous concepts and modes of learning, to bring about effective learning and development of the formal, abstract-scientific concepts and modes of learning.

The discussion below also examines the debates about schooling, culture and cognitive development in South Africa. The recommendations of how the limitations of the socio-culturally derived forms of schooling and classroom teaching and learning could be overcome are also based on the application of the theoretical concept of the zone of proximal development. The concept of the zone of proximal development is posited as a conceptual tool for addressing the problem of how to confront less adequate and often culturally derived modes of learning that may serve to hamper effective formal school learning and the development of scientific and abstract-theoretical systems of knowledge and concepts. The discussion below further elaborates on how the concept of the ZPD can be applied to children's cultural context of everyday, spontaneous, learning and development in 'pre-school' or out-of-school situations. Instances of how the concept of the ZPD could effectively be applied in children's cultural contexts of learning and development are provided and exemplified by Wertsch's (1990) description of mother-child interactions in everyday, spontaneous, learning and developmental settings, as discussed in detail in Chapter 2.

The application of the ZPD in primary school learning and development is elaborated in the discussion that uses the example of Hedegaard's (2002; 1996; 1990) 'teaching experiment' and Galperin's 'developmental method', discussed by Arievich and Stetsenko (2000). These theoretical models applied to illustrate more effective forms of classroom teaching and learning that take learners' development into account, was also discussed in Chapter 2. The discussion concludes by examining how the concept of ZDP can be applied in curriculum design by positioning the teacher as mediator within the tradition of formal, scientific and theoretical systems of knowledge to which learners must be inducted. Once appropriately positioned within this tradition, clearly defined as distinctive from the learners' everyday, spontaneous learning and developmental settings, the teacher must regulate the relations between these two systems of knowledge and conceptual relations. It is this regulation that his or her learners must internalise.

A system of regulation, or mediational process, that is based on the theoretical rather than the empirical system, and the abstract and scientific rather than the concrete and

spontaneous concepts, is proposed as the most appropriate model for confronting the prevailing problems of schooling and classroom teaching and learning. Learners are guided to systematically acquire these new, abstract-theoretical concepts and system of knowledge, which should enable new, theoretically based analyses and forms of understanding of the everyday life-world of learners.

5.2. The cultural context of schooling

There is a complex relationship between the practices of schooling and that of a society in which schooling is embedded. Formal education is, essentially, a Western transduction in many situations in South Africa. In Venda, the primary goal of missionary schooling was not the provision of education per se, but converting people to the Christian faith. Therefore, the early development of schooling in Venda had a predominantly missionary purpose. Past missionary practices were instantiated in the present practices of classroom teaching and learning, in the form of rote learning, memory based and drill methods of teaching and learning and the associated chorus repetition of answers, as a way of committing knowledge into memory. These practices, although simultaneously related to other culturally derived and socio-historically acquired forms of classroom practices, had their origin in the practices of missionary schooling.

The cultural and historical context of schooling and its present practices of classroom teaching and learning are related in a complex manner. This relationship does not involve a mechanistic determination of present practices of schooling and classroom teaching and learning by their past, historical, practices. The analysis of the present practices of schooling and classroom teaching and learning should reveal instances of past societal and schooling practices, albeit not always apparent. The seemingly authoritarian and teacher-centered relational structure, and the asymmetrical power differentials between teachers and pupils, may, for example, (in addition to their possible cultural connotations) be instances of historically evolved forms of the past practices of missionary schooling. As reported (Nemudzivhadi, 1991; 1987), teachers within the missionary schooling system were priests who simultaneously acted as teachers, while pupils were religious converts. Meanwhile, learning involved reading and

rote-memorisation of catechism and other religious texts and successful learning was rewarded with baptism. Such practices suggest religious rather than educational processes and are not congruent with the formal and developmentally oriented modes of classroom teaching and learning necessary for the transformation of learners' existing spontaneous concepts and empirical modes of learning acquired.

Formal schooling had its origin in missionary practices and was historically associated with the processes of the early colonial relations. This relational system was instantiated in policies around the instructional medium and the apartheid schooling and curriculum. The experiences the Venda had with colonialism, which coincided with missionary arrival, defined a difficult relationship the Venda subsequently had with the missionaries—and hence the attitude that ensued with regard to formal schooling. These socio-cultural processes were not processes of history—conceived of as the study of some past events in isolation from the present. They were processes of society, specifically the socio-cultural development of schooling.

There was therefore, a tension between the inherent demands of formal schooling, such as those assumed in the present study regarding the development of the scientific and theoretical form of learning and concepts, and the existing practices of schooling and classroom teaching and learning that evolved from the historical past of the South African and Venda schooling and society. Schooling in Venda continues to be essentially associated with the utilitarian goal of preparing youth for employment and therefore continues to serve the instrumental goal of providing skills of reading and writing in TshiVenda and English, required for employment in the civil service, in the police service, in the teaching and nursing professions, etc.

Schooling was, for example, never projected from the beginning as an institution geared towards development of new forms of understanding on the part of learners. That is, school learning never contributed to the development of learners' everyday knowledge and understanding of immediate life-world. Teaching served the instrumental goal of getting pupils to acquire knowledge in the most simple and less demanding, as well as uncomplicated ways. The transmission model of teaching was appropriate for this

purpose. An instance of the Grade One teacher's account (see appendix 3.1.) suggesting that the post-apartheid schooling system enables learning of useful, practical knowledge that would enable her pupils to take up technical careers and enhance their economic participation in the future was an example of this tension.

The historical processes of schooling and society had implications for the present practices of classroom teaching and learning. For a system that placed more emphasis on transmission, rote-memorisation and reproduction of knowledge with less emphasis on deep learning and conceptual understanding, and, in the absence of clear conceptual tools for overcoming the former, the past practices of schooling were more likely to be continued, even with a new curriculum framework that explicitly demanded their transformation.

The problem of language development for purposes of classroom teaching and learning defined the cultural embeddedness of the practices of schooling and classroom teaching and learning. Teachers perpetually found themselves confronted with the language dilemma. On the one hand, teachers thought that it was economically beneficial for their pupils to know English well so they could gain access to the South African mainstream economy. On the other hand, the teachers knew that their knowledge of English was not well developed and that their learners did not have sufficient exposure to English so they were unable to understand instruction given only through the medium of English.

As a result, and especially in Grade Four, the teacher used English for classroom instruction and engages in "code switching" between TshiVenda and English as a form of a simultaneous translation process. This situation, as could be seen in the Grade Four reading lesson and the Grade Six Geography lesson discussed in Chapter 4, obstructed pupils' engagement with the conceptual system of knowledge and learning, overburdening the pedagogic process and limiting the learning time and coverage of the learning content.

While the school's policy prescribed that pupils in the junior primary phase, Grade One to Grade Three, needed to learn through the medium of their home language, teachers manifested an inclination to begin teaching, as soon as possible, in the English medium. The teachers concerned reported that the reason for this preference was that pupils needed to be exposed to English as soon as they began schooling so that they could master this language early on and be ready to learn through it by the fourth grade, at least. English is the language of commerce and government administration in South Africa. During the apartheid regime, English had the same official status as Afrikaans. The global influence of the English language probably had a further influence on perceptions about its importance for pedagogic purposes in school. The post-apartheid political dispensation; although according equal official status to English, Afrikaans and the nine indigenous languages, in practice used English more than any other official language and, by implication, endorsed its status as the unparalleled language of commerce, administration and education in the country.

The mastery of the English language, that is, speaking and writing, continues to be considered within the Venda schooling system, as the ultimate goal of school learning. As a result, TshiVenda holds a precarious position within formal school teaching and learning. However, TshiVenda was preferred for clarifying what teachers considered to be incomprehensible to their learners. At the same time, teachers used TshiVenda to make a point, to offer instructions they considered to be crucial for pupils to complete tasks correctly and to express ideas or give information. Translating the content of the lesson from English to Tshivenda for the purpose of clarifying concepts and giving instruction seemed to present serious problems. Teachers often misrepresented the original information and confused the meaning of concepts. This confusion also seemed to be manifested at the level of curriculum, as exemplified by the Grade One lesson described in Chapter 4. The translation of the word "noun", as an equivalent of "name" in TshiVenda, illustrated this confusion. In this lesson, the teacher led her pupils into believing that the word "bird" was not a *noun*. This confusion may be ascribed to a lack of an equivalent concept for "noun" in TshiVenda, as may equally be ascribed to the teacher's apparent lack of clear conceptual understanding of her subject matter.

The cultural context of schooling in Venda, therefore, constitutes a complexity of practices of formal schooling and classroom teaching and learning that have been shaped by the practices of the historically evolving socio-political and cultural traditions of the larger society and schooling. This cultural context of schooling highlights the socio-cultural influences on cognitive and conceptual developmental processes taking place in the course of classroom teaching and learning. An understanding of this context of schooling provides important insights about the specific social and cultural regularities of cognitive and conceptual developmental processes, within the present conditions of social change in Venda and South Africa. The social and cultural context of schooling in Venda is therefore multifaceted in that it simultaneously manifests, in its present conditions, instances of the indigenous practices of the specific cultural traditions, the religious traditions of the 19th and 20th century missionary practices, and the traditions of the past, apartheid societal and schooling.

5.3 Conceptions of culture, schooling and cognition in South Africa

This discussion explores the examples of specific research in South Africa that examined the role of culture in cognitive development in society and school learning. The discussion focuses specifically on how the role that culture played in cognitive development in South Africa was conceived, and what contribution the present study makes into these debates. The present discussion does not, however, suggest that the views ascribed to these studies continue to be held by the researchers concerned. However, these works have influenced the present study in important ways while aspects of their conceptualisations were modified in line with the theoretical position of the present study.

Some South African researchers, such as Macdonald (2005a & b), suggested that the modes of classroom teaching and learning might evolve social forms that teachers may find consonant with their cultural practices. For example, the oral and narrative form that characterised teaching and learning in most South African classrooms may be related to the dominance of oral culture in everyday, cultural settings African teachers and learners. This view derived from the observation that in African traditional social

settings, children engaged with their peers, grandparents and other adult members of their communities in folk tales and in the inculcation of moral values through word of mouth. The initiation schools in African traditional societies are other instances of learning situations whose methodology is apparently exclusively oral and narrative.

In addition to the oral-based approaches to teaching and learning, Macdonald (2005a) further viewed the authoritarian approaches to classroom teaching and learning as pan-African phenomenon. This, she argued, was characterised by the widespread administration of corporal punishment and the general perception by teachers that their training had provided them with professional authority. The emphasis on the factual content of the textbooks and readers was also viewed as related to the cultural modes of learning by observation and imitation. In this pan-African methodology for teaching and learning, form was emphasised and imitative competence was valued over generalisable and transferable knowledge and skills (Macdonald (2005a).

This analytic approach in Macdonald's (2005a) work emphasised traditional cultural processes and their influence on classroom teaching and learning. The problem was not defined, specifically, in terms of the inadequacies of the previous, apartheid, South African schooling system. This study emphasised the constraining capacity of the indigenous cultural practices when reproduced in the context of classroom teaching and learning. In other words, indigenous culture constrained the possibility for effective teaching and learning. As a consequence, one of the primary recommendations in Macdonald's study was that African schooling be afforded the opportunity to learn from the 'White' or Western schooling and cultural system:

> In a changing situation such as we have in South Africa, it is very common to blame difficulties and failures on apartheid; the simple belief is that in a new dispensation difficulties such as those experienced in a formal education will simply disappear, especially if schools are better resourced. I would want to contend that because the socio-historical trajectories of the two systems have been so different—and especially because the two systems have not had occasion for interacting in a fundamentally meaningful way—that equality in

> schooling may well be a great deal more unattainable than generally presumed (Macdonald, 2005a: p. 308).

In South Africa, Moll (2004; 1995; 1994), Miller (1989; 1985; 1979) and Craig (1989; 1987; 1985) led some of the sterling work in the socio-cultural research tradition. The work that these studies covered viewed formal school learning as a necessary condition for the development of formal thought processes in pupils, but questioned the adequacy of the apartheid schooling. From this perspective (Moll, 1995; Moll and Slonimsky, 1989; Craig, 1989; 1987) the apartheid schooling in South African failed Black pupils because it was designed to deny them an effective learning experience and good quality education. These studies proposed that integration of Black pupils into the White South African schooling system, which represented a Western form of formal schooling, would provide Black pupils with effective cultural-psychological tools that the apartheid schooling system has denied them. This was an anti-apartheid stance.

In general, the cognitive consequences of schooling were viewed from a universalist perspective (cf. Cole, 1996; 1988). The experience of formal, Western-type schooling was considered a necessary condition for the development of formal thought processes. That is, the practices of schooling and classroom teaching and learning were viewed as antithesis of the spontaneous and everyday forms of learning. Meanwhile, the experience of schooling was viewed as a necessary and sufficient condition for overcoming the everyday, spontaneous concepts and their associated relational systems of knowledge. The inadequacies of the apartheid schooling system were acknowledged and challenged, but the specific cultural context of learning and development was never thoroughly examined. The assumption was that the transposition of one model by another would in itself be sufficient for generating school-specific, formal thought processes.

However, Craig's (1985) and Craig and Miller's (1984) analyses of the interactional modes of mothers and their children had the potential to provide insight on the internal organisation of the culturally shaped dyadic activities that might have impacted on the quality of classroom teaching and learning within a formal school system. These

practices of cultural learning and child rearing traditions suggest a “cultural zone”, which should provide insight into the culturally derived, everyday, spontaneous learning and developmental conditions of children in these specific socio-cultural settings. Craig’s study was based on Wertsch’s study of the internalisation processes among middle class North American mothers in dyadic, puzzle-making, interaction with their children that was discussed in detail in Chapter two of the present study (Wertsch, 1980 cited in Craig and Miller, 1984).

Craig’s study was conducted with a sample of 158 Zulu mothers of 18 to 36 years in the urban township of KwaMashu in Durban, South Africa. The mothers had schooling experience ranging from three to twelve years. Craig and Miller (1984) argued that the results of the study could be interpreted in two ways. Either the interactional patterns of the township mothers could be regarded as deficient, if the focus was on what they were not doing relative to their American counterparts in Wertsch’s study, or they could be interpreted as rational, given the manner in which they construed the goal of the task, “as the specific placement of particular pieces in their correct position”. According to Craig and Miller the Zulu mothers appeared to be teaching their children to do the task “with them”, while the American mothers in Wertsch’s study appeared to be teaching children to do the task “without them” (Craig and Miller, 1984: 20).

Tharp and Gallimore (1988/1991) viewed the ‘cultural zone’ of learning and development as crucial for structuring appropriate strategies for the provision of formal school learning, in the children’s zone of proximal development. A consideration of learners’ zone of proximal development in their specific socio-cultural contexts of learning and development was also suggested in studies such as those conducted by Hedegaard (2002; 1996; 1990). In this study, the formal school learning tasks were related to the learners’ knowledge and experiences in their socio-cultural contexts. That is, learners were encouraged to discuss and analyse their everyday, cultural, knowledge and to interrogate it on the basis of the theoretical and formal relational system of knowledge in which the teacher provides guidance through her theoretical instructional methods. The concept of the zone of proximal development, conceived as a cultural zone, should imply, for formal school learning, that the teacher had insight into the

patterns of learning and thinking that underlie her learners' everyday, spontaneous, development and, through school tasks, seek to guide her learners to acquire new, school-specific forms of learning and knowledge by clarifying the underlying contradictions between the cultural, spontaneous, modes and the formal, scientific, modes of learning.

Muthivhi (1995), in a small South African research project modelled around the Vygotsky-Luria study (Luria, 1976), and inspired by Moll's (1994) work, found that learners in a rural South African secondary school setting (13 to 19 years old) whose schooling was affected by the 1980s political disruptions lagged behind their counterparts, in a school not equally affected, in their performance on a series of the Vygotsky-Luria experimental tasks. While learners in the first school that was affected by the disruptions emphasized the concrete and functional mode of classification in the majority of the tasks situations, pupils from the second (comparative) school that was less affected did, as well, manifest concrete and functional mode of thinking, although not to the same extent. In essence, the performance of the learners in the two respective schools demonstrated what in Cole's (1988) terms is interpreted as 'heterogeneity' of thought processes. That is, the experience of schooling did not lead to a transposition of learners everyday, spontaneous forms of thinking by the formal, scientific thought processes. The nature of transformation towards formal, scientific thought processes manifested a simultaneous continuation of aspects of the learners' everyday, spontaneous forms of thinking and problem solving.

In a related study conducted with an elderly and illiterate subject, Moll (1994) found that his subject consistently responded to the tasks questions in a concrete and context-specific manner. The subject responded to the experimental questions in a way that was interpreted as demonstrating a lack of abstract and categorical form of thinking and concepts. In conclusion, Moll contended that his paper:

> [H]as presented a case study of aspects of the cognition of a man […] described as a member of a bygone era. His characteristic patterns of activity have been formed throughout his life by cultural circumstances that were "traditional", subsistence oriented, illiterate and unschooled, rather than modern […] (1994:

33-34).

Moll further argued that his paper defends the claim that:

> Formal schooling […], rather than merely literacy or the transformation of economic relations of production, is necessary to the explanation of the emergence of such cognitive operations in mind and in culture (Moll, 1994: 33-34).

The South African research orientations, as demonstrated in the examples discussed above, seem to emphasise the constraining capacity of indigenous cultural practices and modes of teaching and learning (Macdonald, 2005a) as well as a generalised transformational capacity of formal school learning, which the apartheid schooling system failed to generate on the part of the majority of learners (Moll, 1995; Craig, 1989a; 1989b; 1987).

In a way of extending the above research the present study examined the extent to which the present practices of schooling and their past, historical, circumstances were mutually constituted to create a unique socio-cultural context of learning and development for learners. The practices of schooling and classroom teaching and learning constitute an evolving cultural context. In this context, practices originating from past, historical processes of local cultural traditions, the traditions of missionary schooling and the apartheid schooling practices are continued, at the same time that they are actively being transformed. Understanding the regularities of these specific cultural processes on the practices of schooling and classroom teaching and learning and their cognitive consequences is important for designing appropriate intervention programmes for classroom teaching and learning in the post apartheid South African schooling system.

5.4 Pupils' thinking and problem solving in the experiments.

The experimental tasks revealed that the subjects generally responded to the questions and solved the problems in a concrete, functional, and experiential manner, at the same time that they used the formal and abstract mode of thinking. In their responses to the tasks' problems, the subjects tended to use concrete functional and abstract-categorical

modes of thinking and problem solving alternately. The subjects did not stick exclusively to one particular mode of thinking in total exclusion of the others in their tasks responses.

The responses to the Circles Tasks questions suggest that by Grade Three the subjects (eight years old) have acquired the appropriate form of thinking and conceptual understanding required for addressing the tasks' problems competently, albeit in a concrete manner. This pattern of thinking and problem solving seemed to repeat itself in the case of the responses to the Vygotsky-Luria Classification and Generalisation tasks. By Grade Three, the subjects could understand and use formal-abstract forms of thinking and problem solving, but simultaneously made use of the functional and graphic modes of classification. This cognitive approach to the tasks problems seemed to be consistent with the subjects' schooling practices and their everyday, spontaneous learning in their culture.

The observation of the practices of schooling and classroom teaching and learning suggested that the subjects' schooling did not distinguish, conceptually, between the knowledge systems that were specific to formal schooling and those that characterise non-school, everyday learning situations. As a result, the everyday, spontaneous and culturally derived modes of thinking and problem solving were reproduced, even on tasks that specifically demand the use of the formal, abstract and theoretical modes of thinking and problem solving.

In the first set of tasks; Experiment 1, Circles Tasks, adapted from the neo-Piagetian[1] studies of Pierraut-Le Bonniec (1980) and Macdonald (1987), the subjects in the current study lagged behind their counterparts in the French, Scottish and South African 'multicultural' schools, respectively (Pierraut-Le Bonniec, 1980; Macdonald, 1987). For example, all the Grade Five French subjects (with the average age of ten years old) were able to respond to the tasks questions competently. They showed the awareness of indecisiveness and formulated a hypothesis about the colour value of the covered

1. These studies are referred to, in this discussion, as neo-Piagetian in the sense that, while they seek to expand on the Piagetian research and explanatory framework, they do not necessary adhere strictly to the classical Piagetian explanatory concepts but emphasize its application to educational concerns.

element as basis for their responses. In contrast, only sixty nine percent of the Grade Five subjects (of the same age range) in the present study demonstrated the same level of task performance.

The performance of the Grade Five subjects was at the same level as that of the equivalent subjects in Macdonald's (1987) Black township schools. In these Pedi and Tswana-speaking township schools, only three quarters of the subjects in each school performed competently on the same tasks. The present experiments also revealed, therefore, that subjects do not apply only one mode of thinking and problem-solving strategy to solve the experimental tasks problems. The subjects did not discriminate between the distinct categories of thinking; namely, between the concrete, functional-graphic and abstract-categorical modes of thinking. They easily changed from one form of thinking to the other depending on the cognitive demands of the specific task situation, apparently without perceiving the contradictions. Such response pattern characterised the performance of the Grade Seven subjects as well, although to a lesser extent. The Grade Seven subjects, who were twelve years old already, could similarly not respond to all the task questions without simultaneously applying the concrete and graphic-functional thought processes.

The subjects' manifest thought processes, with regard to their Circles Tasks performance, originated from their formal school and their culturally derived everyday and spontaneous learning and development. The analysis of the subjects' performance on the experimental tasks revealed that by Grade Three, the subjects demonstrated that they had achieved operational thought while by Grade Twelve they had achieved formal operational from of thinking. Meanwhile, the analysis of the observational data revealed that the subjects' schooling was dominated by concrete approaches to learning and problem solving, which should explain why the subjects did not apply formal thought processes consistently in the practical problem-solving situations of the experiments.

The subjects' performance on the Classification and Generalisation tasks revealed that, by Grade Three, the subjects could classify the tasks' objects in abstract-categorical

manner and support their classification with abstract reasoning based on the use of linguistic concepts. However, because the subjects' schooling did not emphasize abstract and theoretical systems of knowledge and concept learning and development, the subjects failed to apply these forms of thinking consistently in their responses to the tasks questions. That is, although the subjects had acquired the abstract-theoretical method through their schooling, their application of such method in the experimental tasks was not consistent probably because their schooling did not explicitly distinguish between the two forms of knowledge or emphasize the distinctiveness of the school-specific formal system of knowledge and learning. As a result, the subjects applied the concrete and graphic-functional method in their responses to the tasks questions at the same time that they applied the formal and abstract forms of thinking and problem solving. The concrete and graphic-functional mode of classification used by the subjects can be traced from their concrete contexts of experience, as well as from the specific system of categorization that the subjects' language, TshiVenda, deploys.

This view defines the complex nature of thought processes, and the plural manner in which the subjects' thought processes are manifested in practical problem-solving situations. This view is akin to Moll's (2004) articulation of the relations, in my highly abbreviated quote below:

> [N]either development nor learning exists in a temporally prior relation to the other. Indeed, they are concepts that describe real structures and actual functions that operate […] simultaneously […]. Development and learning, structure and function, the generative mechanisms of mind and school learning […] are all simultaneously interactive and co-determine the course of each other (Moll, 2004: 314).

This brings us to a view of the relationship, involving a tension, between the processes of development on the one hand and the processes of learning on the other hand. This tension, as will be demonstrated by the examples of the experimental performance below, seems to play itself out in the tasks performance activities of the subjects. Vygotsky accepted that learning need to be matched in some way to the level of the child's spontaneous developmental processes. However, he argued that learning,

especially among school-going children, does not need to be limited to the children's developmental achievements. Learning, in this situation, is related to development in a special way in that it contributes to the child's developmental process. This understanding of learning hinges on the notion of teaching as guided assistance in the zone of proximal development (ZPD). The concept of the zone of proximal development (to be discussed in more detail below) involves a specific location of pedagogic interactions, at the appropriate level of the child's development so as to bring about further developmental achievements. That is the level of development where the activity of teaching and learning does not match the already developed psychological functions but occur at reasonably more advanced level where the child participates under the guidance and assistance of a more competent adult or peer (Vygotsky, 1978).

The results of the Classification and Generalisation Tasks revealed a form of pluralism of psychological processes that has implications for the subjects' learning and development. The processes of formal school learning on the one hand, and the everyday, spontaneous development on the other, seem to occur much like overlays upon each other and never changing and transforming each other to produce new learning and development. The subjects' schooling emphasized the "empirical epistemological procedure", instead of the "theoretical epistemological procedure", specific to formal school knowledge and learning (see Hedegaard, 2002; 1996; 1990).

For example, the concept "animal", in TshiVenda, was not experienced as a category that subsumes both domestic and wild animals. The concept "animal", that the subjects were expected to use as basis for their classification of the tasks objects did not therefore equate with the specific conceptual system of the subjects' TshiVenda language. In TshiVenda, the concept "animal", is differentiated into "wild animals" and "domestic animals". The system of categorization in TshiVenda, although abstract, emphasized the functional aspects of the objects to be categorised. This is contrary to a system, such as English, that emphasizes categorical relations established through subsuming objects under single linguistic term. Further investigation of the full implications of conceptual differences between TshiVenda and English would be important for understanding the problems of concept learning and development of

English second or additional language learners in South Africa.

Although TshiVenda is a rich language with complex grammatical structure, and is now studied as an academic subject in schools and at higher education institutions, insufficient attention was historically given to the development of this language. This view was supported by the observational data that revealed an acute lack of readers for school children available in TshiVenda. Most readers used in the primary school, even under the new curriculum dispensation, were originally written in other languages such as English, before they were translated into TshiVenda. The implications of this is that translation was often not adequate and meaning was often lost during the translation process while borrowed words did not always make meaningful sense to TshiVenda speaking readers. Most crucially, according to the present findings, the translation would need to pay close attention to distinct conceptual systems across the two language contexts and ensure that concepts are affectively translated to bring about new learning and conceptual transformation.

5.5. Classroom teaching and learning

Vygotsky's socio-cultural theory, and its elaborations in the post-Vygotskian Activity Theory research traditions, illuminates the problems of traditional schooling and possible ways to overcome them. In particular, Vygotsky introduced the groundbreaking concept of the zone of proximal development through which the relationship between learning and development, especially concept learning and development, could be better understood. In addition, Vygotsky made the crucial distinction between the nature of the concepts that are specific to formal schooling and the nature of the concepts that are characteristic of non-school, everyday-life, spontaneous learning and developmental settings. These concepts were referred to as the scientific and the everyday, spontaneous concepts respectively. Scientific concepts did not necessarily refer to concepts in science but to the fact that these concepts were structured in a systematic way that related to the knowledge systems specific to formal schooling. Vygotsky proposed that when a concept was encountered for the first time in school its long process of development, within a learner, had just begun. This suggested that the

developmental process for scientific concepts is prolonged. Thus, scientific concepts are not learned through simple concrete experience and direct memorisation, as is often the case with everyday, spontaneous concepts (Vygotsky, 1981; 1978; 1962).

In their relationship to each other, the scientific and the spontaneous concepts are positioned in a specific way that is, in turn, also related to the contexts in which they are experienced and to the activities that give rise to them. This is a crucial point as it has important implications for the organization of school curriculum and the classroom practices of teaching and learning. Meanwhile, and related to the notions of the scientific and the spontaneous concepts, there are the associated concepts of the empirical and the theoretical methods, or epistemological procedures. The notion of the empirical and the theoretical concepts derived from the post-Vygotskian, Activity Theory research and scholarship. These concepts elaborated and expanded on the notions of scientific and spontaneous concepts. The discussion below uses these theoretical concepts to focus on the present problems of schooling and classroom teaching and learning in Venda.

Two major problems that repeatedly came up during the observation of the classroom practices involved the issue of conceptual clarity on the part of teachers and the conceptual understanding of learners. Concomitant with these problems was the problem of language as medium of instruction and concepts as tools for thinking and understanding of subject matter content. For example, teachers used the new curriculum concepts and principles to organise their classroom activities. In this way, teachers changed their past practices of the apartheid schooling through active use of the concepts and principles of the new curriculum. However, in conjunction with this, teachers unintentionally continued the practices of the apartheid schooling into their present, post-apartheid practices of teaching and learning. The teachers' present practices were constrained by their lack of adequate mastery in, and competency with the principles and concepts of the new Outcomes Based Education curriculum. The historical conditions of these teachers, as well as the present conditions under which the new curriculum was introduced for implementation in schools, seem to militate against effective practices of classroom teaching and learning to create to new learning

and development for learners.

5.5.1. Scientific and spontaneous concepts

Vygotsky's (1978; 1962) distinction between the scientific, or school-specific concepts on the one hand and the spontaneous, everyday, or non-school concepts on the other is appropriate for understanding the nature of the problems that characterised the present schooling system. This is so, especially because teachers did not seem to be consciously aware of the fundamental distinction between the school-specific form of knowledge and its associated methods, and the spontaneous, everyday knowledge and its associated methods and what role teaching plays in this relationship.

The problem was exacerbated, in the past, by the emphasis on transmission and rote-memorisation approaches to teaching and learning that reduced the scientific, theoretical concepts into their everyday, spontaneous counterparts. The dependency on textbook content and the lack of sufficient subject matter mastery on the part of teachers further worsened the situation. Associated with these problems were the problems of the lack of mastery of the language of instruction, English (see for example the Grade Four lesson discussed in chapter 4), as well as the lack of development of learners' and teachers' home language for purposes of classroom teaching and learning. For example, there were inadequate readers for learners available in TshiVenda, while those that were available mostly had translation related problems associated with direct translation, loss of meaning and use of conceptual systems not equitable to those of that TshiVenda deployed.

Teachers did not seem to understand the formal, scientific nature of the knowledge that they taught and how they could effectively facilitate its acquisition by learners in a way that these concepts would continue to help them in their learning of progressively more demanding concepts. The scientific concepts differ from the spontaneous or everyday concepts because the later are not systematically organised. That is, the spontaneous concepts do not place the same demands on learners' cognitive processes, as do the scientific concepts for them to be understood. Scientific concepts are more demanding

in that they are expressed through more complex media such as conceptual language, models and other, more sophisticated cultural media such as numerical and literacy symbols. More importantly, the scientific concepts do not have the immediate, concrete contexts of everyday and spontaneous experience as their referents but other concepts, such that they subsume a system of other, less abstract concepts (Kozulin, 1990; Vygotsky, 1986; 1962).

Language plays a primary role in the organisation of scientific thought processes. In this conceptual system, language ceases to function primarily in direct reference to the immediate environment. It functions, as a medium for scientific concepts and systems of thinking, predominantly as its own referent. That is, language is used, not as a direct referent to concrete phenomena in immediate environment. On the contrary, it functions, essentially, as a referent to itself—subsuming, progressively more complex concepts whose understanding presupposes other, less complex concepts in a complex system of conceptual relationship. The concept of “noun”, discussed in the Grade One lesson in chapter four, is a simple and yet powerful example relevant for understanding the progressively more complex systems of thought that scientific concepts implicate. In this lesson, learners made an explicit use of their everyday, spontaneous conceptual understanding of the concept, “noun”, arguing (using the TshiVenda term for noun) that, *“tshinoni”*—“bird”, does not begin with a capital letter because it is not a “noun”. The teacher accepted this answer and, as a result, did not foster the transformation of the learners’ spontaneous concept so they could understand and experience the more powerful system of “naming” that the concept, “noun”, subsumes. That is, learners’ understanding of the concept of “naming words” were constrained by their everyday concept of ‘name’ as a denoting names of people, as exemplified by the list of names written on the blackboard, to the exclusion of ‘common nouns, such as “bird”.

The formal, scientific concepts that learners acquire during schooling help them to master the world beyond their immediate settings and enable them to understand situations beyond their concrete, outward manifestations. On the contrary, the spontaneous concepts arise out of children’s encounter with concrete objects in their surroundings and their immediate, real-life phenomena. Although this form of

knowledge and concepts provides the basis of formal though processes, it does not provide sufficient tools for thinking beyond the immediate experience and concrete manifestations of phenomena (Vygotsky, 1986; 1978; 1962; Kozulin, 1990; Kozulin et al. 2003). Classroom teaching and learning practices that emphasize rote memorization of factual information and formal, subject matter content without helping learners to understand the internal conceptual relations that comprise formal school knowledge limits learners' learning and acquisition of the more powerful system of knowledge necessary for the conceptual system that is adequate for successful learning and acquisition of the scientific and theoretical system of knowledge. The Grade Six Geography lesson discussed in Chapter 4 of the present study illustrates this process. This lesson reduces the learning of complex and conceptually rich formal-scientific content into a simple matter of rote-based assimilation of discrete and unrelated packages of information with no inherent conceptual connection. Such a spontaneous and empirically based approach fails to transcend learners' immediate and familiar knowledge system and forms of knowing to provide them with the more powerful tools for the formal, scientific and theoretical forms of school learning.

Vygotsky's distinction between the forms of concepts that arise during formal school learning and those that arise during spontaneous, everyday life activities of children is also important for understanding the relationship between language and concept acquisition in pupils, in terms of the development of language itself in the course of children's learning and development. Vygotsky (1986; 1962) has argued that language is crucial for concept formation in children from their early stages in their development. Language goes through stages in its development before it becomes an integral part of the child's thought processes. The early stages of the development of the child's thought involves the use of language as an instrument or tool for mastering the social world, that is, the child's own relations with other people and the world around him or her. This development culminates in the transformation of language and its associated conceptual structure into the inward, mental, or intramental, activity of the child's mind. At this level, the child uses language (or speech) as an inalienable part of his or her thinking processes. In this way, the child masters her own thinking through inner speech or inwardly converted language structures that have become an integral part of his or

her thought processes. This has important implications for the teachers' appropriate usage of language to express ideas and concepts in class. The empirical approach to teaching, and associated use of the English language as instructional medium, by the Grade Four and the Grade Six teachers that involved inaccurate definition of words and unelaborated ideas, as well as the spontaneous switching between English and TshiVenda, could not facilitate learners' mastery of the subject matter and its underlying conceptual relations.

The problem of language in classroom teaching and learning was more pronounced from Grade Five upwards, where the medium of instruction changed from TshiVenda to English. For example, the Grade Six Geography teacher read from a textbook written in a rather difficult language for second language learners at this level. As a result, the teacher used the textbook, explicitly, as a source of information and engaged pupils in passive, receptive learning activities where learners listened to him reading and explaining the text while they only responded to the questions by finishing up the sentences read out from the textbook. Neither the teacher nor the textbook created a learning environment where pupils could enter into a form of dialogue with the lesson content or use language to develop their language proficiency and communication skills, let alone deep, conceptual analysis of the content of learning in the textbook.

Pupils were not afforded the opportunity to engage meaningfully with the learning materials, they were not encouraged to ask questions for clarification or asked if they understood the explanations. Meanwhile, the teacher's lack of confidence in the use of the instructional medium was manifest through his use of phrases that did not accurately clarify the ideas that he sought to express to his learners. For example, this Grade Six Geography teacher said that "gas is horrible", revealing a level of difficulty in finding more accurate words to express the idea, probably, suggesting that gas may be a dangerous substance. It was doubtful that learners in this lesson made meaningful sense of concepts such as "purification", "raw materials" and "finished products". The use of these terms, both in the textbook and by the teacher, was not followed up with elaboration. The teacher resorted to the translation of the terminologies by way of offering what their TshiVenda equivalents, an exercise that mainly served to introduce

further conceptual confusion on the part of learners as the concepts rarely equated directly across the two, TshiVenda-English, linguistic trajectory. This approach hindered concept learning and development and reduced the learning process into a simple acquisition of unrelated factual body of discreet information meant only for reproduction in future during tests and examination situations. Learners' existing forms of understanding and world-view was left scarcely affected by the new learning because they could not relate this meaningfully to their existing conceptual system and forms of understanding.

In another similar instance of the predominance of the concrete and empirical concepts and mode of teaching and learning, the Grade Seven teacher gets her learners to chant words such as "decreasing" and "increasing", without engaging them in meaningful dialogue about these concepts:

T. "When we count going right, numbers are...?"

L. [In chorus]. "Increasing".

T. "When we count going left, numbers are...?"

L. [Again in chorus] " Decreasing" [See the Grade Seven Maths lesson in appendix 3.6. for details].

There was no evidence in the interactions in this lesson that learners were acquiring deep, conceptual understanding of the concept of numbers decreasing and increasing in the number line. The lack of concept understanding in this lesson, specifically the understanding of the concept of number relations within the "number line", was manifest both by learners' systematic inability to provide correct answers to the teacher's questions and the teacher's apparent inability to explain the number concept relative to the specific content of the lesson. For example, the teacher used the terminology of the textbook; such as, "increasing", "decreasing", "ascending", "infinity", "positive", "negative', which appeared to be hard for the pupils, without clearly explaining these concepts. As a result, the teacher did not transform textbook content into meaningful knowledge that could be brought to life in the activity of her classroom teaching and learning by relating the content clearly to her pupils' specific cognitive and level and learning interests and needs.

This undue reliance on textbook and the transmission of content, and an inability to transform textbook content into knowledge that related to the experiences and cognitive activity of learners, was manifest in the teacher's introduction of the concepts; "bigger than" and "smaller than", and their respective symbolic representations. The teacher took these concepts directly from the textbook and insisted in her lesson that learners reproduced them as they were. The teacher rejected the response of a pupil who stated that, "5 is "less than" 0", preferring that the pupil reproduced the exact words of the textbook; namely, "smaller than". This preoccupation with reproduction of "official", textbook terminology, with little regard for the meaning of the concepts, revealed the lesson's emphasis on form, or appearance, rather than on substance or the essence of knowledge. Meanwhile, the teacher avoided asking questions that related to the comparison of negative numbers among themselves as these had proved to be difficult for the learners. For example, no learner could offer a correct answer for the question on which number had a bigger value between "-3 and –6".

The approach to teaching and learning that dominated the present lesson is empirical, as it did not foster the development of meaningful, abstract-theoretical forms of knowledge. The emphasis was, predominantly, on the "look-listen and do" approach. That is, pupils' were guided into producing competent task performance actions without, necessarily, basing those actions on genuine understanding of the concepts and principles underlying their actions—something akin to Wertsch's (1989; 1984) example of the mediational processes discussed in Chapter 2 that involved Action Pattern 2, where the mediational strategies enabled children to produce appropriate task performance without, necessarily, understanding the principles that underlie the nature of the task.

Kozulin's (1990) discussion of the internal developmental relations that characterise the scientific and the spontaneous concepts provides insight into the character of learners' thought processes. According to Kozulin, spontaneous or everyday concepts represent the child's development, or his actual developmental level. The scientific concepts represent the child's developmental potential, or his ZPD. Therefore, according to this framework, school learning occurs at learners' zone of proximal development,

specifically in the child's potential level of development. This learning generates new forms of concepts and knowledge in learners and transforms the course of their learning and development. To this effect, Vygotsky (1979; 1962) argued that once the scientific concepts are introduced into the child's learning, the process of their development has just begun. The scientific, abstract-theoretical concepts begin a long process of inward developmental transformation into the child's own developmental achievement.

The internal process of the development of the scientific concepts follows specific rules. That is, the nature of these concepts demands that they are taught, learnt and acquired in a specific way that is appropriate to the nature of their internal constitution. Scientific concepts are a product of human systematic enquiry and abstract-theoretical analysis within the formal institutional context of schooling and educational activity. These concepts differ fundamentally from the everyday, spontaneous concepts in terms of their internal constitution and genetic origin, as well as their developmental transformation within the societal activity of formal schooling. As a result, the formal, scientific knowledge and concepts cannot effectively be taught—and acquired, in the same manner in which the spontaneous, everyday concepts are acquired. Vygotsky (1987; 1962) argued that the scientific concepts are not to be taught through drilling, as this would distort their development. Hedegaard (2002; 1996; 1990) argued that when these concepts are taught using the same methods that characterise their everyday, spontaneous and empirical knowledge, the results would be the development, on the part of pupils, of the empirical rather than the formal, theoretical concepts and forms of knowledge.

Learners first encounter scientific concepts during formal schooling. These concepts are characterised by being abstract with no immediate applicability or direct relevance to the learners' concrete experiences. Generalisations established through the use of language-based concepts, models, schemes, criteria, formulae, etc., rather than the immediate, concrete experiences of learners, play a crucial role in the mediation (teaching) and the acquisition (learning) of scientific concepts. The acquisition of scientific concepts during formal school learning, therefore, introduces to pupils,

generalizations that are not always possible when learning takes place in situations that foster the empirical and everyday, spontaneous knowledge and modes of learning.

The nature of the scientific concepts, and the method through which they are to be mediated and acquired, differ fundamentally from those that characterise the spontaneous, everyday concepts. However, the development of scientific concepts is dependant on learners' acquisition and mastery of spontaneous concepts, but transforms these concepts and introduces new paths of development and learning on the part of learners. This transformation is, however, only possible when classroom instruction is premised on the theoretical epistemological procedures whereby the practices of classroom teaching and learning model the scholarly activities that gave rise to the theoretical and scientific forms of knowledge. Such activities are discussed in detail in the lesson examples, in section 5.6 below.

According to Vygotsky, scientific concepts, once assimilated into the child's thinking, develop "downwards" towards greater concreteness and applicability. If scientific concepts are not meaningfully related to the relevant aspects of the child's spontaneous concepts—with the teaching activity oriented towards revealing the contradictions that underlie the concrete, spontaneous forms of knowledge and concepts on the one hand and the formal, scientific forms of knowledge and concepts on the other hand, the formal, scientific concepts, of which school knowledge is constituted are likely to be acquired as empty verbal utterances with no real meaning to the life-world of the child. According to Vygotsky, the development of scientific concepts in children sets in motion the "upward development" of everyday, spontaneous concepts towards greater systematicity and generalization. The blurring of these relations, in the present teachers' practice, seems to account for the lack of conceptual clarity and systematic conceptual development on the part of their learners. Concomitantly, the lack of mastery and confidence in the language of instruction by teachers means that teachers would have problems understanding the concepts embodied in the language, through which they are supposed to mediate their learners' learning and development.

Learning support materials, in the form of textbooks, also seemed to contribute to the

worsening of the problems experienced in the present schooling. The learning support materials used by teachers in the lesson examples discussed in Chapter 4 in the present study emphasized narrative, as opposed to discursive forms of content presentation. As could be seen in the instance of the Grade Six Geography lesson in Chapter 4, this mode of presentation of knowledge seems to encourage the empirical mode of teaching and learning while hindering discussion, dialogue and analysis, which seem to be necessary for generating new modes of school-specific, scientific forms of knowledge and learning. What was fostered by the past practices of the apartheid schooling, and reproduced by the present practices of teachers and learners in Venda, involved a relational system knowledge that was mainly inconsistent with formal school's scientific and theoretical modes of classroom practice. This empirical, rather than theoretical, mode of classroom practice was inadequate for transforming learners' existing, culturally derived, modes of learning and concept development.

5.5.2. Empirical versus theoretical methods

From the Socio-cultural perspective, the nature of knowledge and the methods appropriate for its acquisition are , aspects of a single process. The problems observed in the present study with regard to classroom teaching and learning, in particular, seemed to relate to teachers' use of the teaching and learning approaches that were not consistent with knowledge form characteristic of formal schooling. These methods cannot be a matter of arbitrary choice because the nature of concepts is determined by the efficacy of the knowledge procedures through which such knowledge comes into existence. The learning of scientific concepts in school, for example, needs to follow an epistemological procedure or knowledge development process that is consonant with the formal, scientific form of knowledge and concepts.

This view is consistent with that elaborated by Hedegaard (2002; 1996; 1990). Drawing from Davidov's work (Davidov, 1985; 1982; 1977), Hedegaard (2002; 1996) distinguishes two forms of knowledge that arise out of societal practices. These knowledge forms involve the "empirical knowledge" and "theoretical knowledge". Each of these two forms of knowledge is associated with its own distinctive "epistemological procedures". According to Hedegaard, empirical knowledge is generated in

spontaneous, everyday-life activities. This form of knowledge arises through the observation of concrete phenomena in the immediate surrounding of pupils' everyday experiences. Language and imagery are the main mediums through which empirical knowledge is communicated and acquired. Memory, observation, comparison and categorisation are the dominant procedural forms through which empirical knowledge is acquired. Empirical knowledge does not emphasize the fundamental relations and interconnections among phenomena, but the discrete and concrete form in which phenomena manifest themselves in everyday, spontaneous situations in which they occur. The empirical form of knowledge and learning, therefore, differs in fundamental ways from the school-specific and theoretical form of knowledge, both in its nature and in the methods through which it comes into existence.

Theoretical knowledge, according to Hedegaard (1996), deals with the interconnections of phenomena. That is, phenomena are conceived of in terms of their underlying connections rather than only in terms of their discrete, external forms. This form of knowledge arises through the development of methods for understanding the origins, relations, and the dynamics of phenomena. The dominant procedures through which this form of knowledge is acquired involve the use of models, schemas, criteria and concepts. Theoretical knowledge, therefore, emphasises the relations and transformations that characterises objects and phenomena. Through the methods of the theoretical knowledge, the transformation that characterises the scientific phenomena is observed by recreating the object in its relation to other objects—a process that, in Hedegaard's view, has the character of experimental exploration of relations and changes.

The school-specific, scientific form of knowledge has the character of theoretical knowledge. Scientific concepts are communicated and acquired through abstract language systems and through the formulation of abstract relations and categories that characterise the use of models, schemes, criteria, etc. (Vygotsky, 1978; 1962). Language functions as a tool for abstraction of relations among objects and conceptual systems and differs fundamentally when it occurs in school from when it occurs in everyday-life, spontaneous situations. In specific cultural settings, language, such was

the case with TshiVenda—in regard to the subjects' responses to the Classification and Generalisation tasks in Chapter Three, may deploy a conceptual system that do not equate directly with the abstract-categorical forms necessary for successful performance on formal school tasks.

The scientific and theoretical form of knowledge has the quality of artificial tools through which humans master the world around them. Language involves, fundamentally, the quality of deliberate and conscious human purposive activity when it arises in the context of classroom teaching and learning. That is, teachers need to use language deliberately to foster the transformation of their learners' less adequate forms of expression of their thoughts and understanding. The lesson excerpts discussed in Chapter Four revealed a mode of language use that did not foster abstract, scientific and theoretical forms of thinking and learning. Learners were never encouraged, in these lessons, to communicate their knowledge and to verbalise their ideas as a way of fostering conceptual learning through language use. On the contrary, the lessons fostered the use of abbreviated forms of communication, characterised by one word or single phrase responses to the teachers' questions. In this way, the use of language was inconsistent with the school-specific theoretical, but emphasized the empirical epistemological procedure.

The notion of empirical and theoretical epistemological procedures is related to the cognitive procedures that characterise learning and development in specific situations of their manifestation. That is, the theoretical epistemological procedures could be related to dominant mode of learning in formal school settings while the empirical epistemological procedures could be related to the methods of learning that dominate everyday, spontaneous situations. The child's acquisition of concepts is simultaneously tied up with his acquisition of the cognitive procedures and methods that are associated with such concepts (Kozulin, 2003). Arievich and Stetsenko (2000) reiterated this view. They considered how the quality of culturally shaped psychological tools of formal learning in schools influences mental development and functioning. They examined, from the perspective of the ideas originally proposed by Piotr Gal'perin, how the quality of culturally evolved cognitive tools was related to the quality of classroom instruction for

bringing about learning and development. They indicated that Gal'perin's study found that classroom instruction based on the theoretical concepts, as opposed to the one based on the empirical concepts, was capable of generating cognitive development by providing learners with the necessary cognitive tools.

Hedegaard's (1996; 1990) assertion that a theoretical epistemological procedure should characterise the mediation of scientific, theoretical knowledge is important for thinking about the solution for the problems of teaching and learning and concept development that characterised the present Venda system of schooling. The epistemological procedure for classroom teaching and learning should take the concrete realities and life experiences of learners into account by engaging them in the learning activities that, while working with the content that is familiar to them, simultaneously guide them into new learning modes and acquisition of new relational knowledge, specific to the tradition of formal schooling. Herein lies a possible solution to the tension between a political commitment to democratisation and cultural relevance implied in the South African OBE curriculum framework on the one hand, and the Vygotskian distinction between the everyday, spontaneous (experiential) concepts and the scientific theoretical (and formal) concepts on the other hand.

5.5.3. Theory, contemporary schooling and curriculum practice

There is a tension that plays out within the present schooling and society in South Africa, encapsulated in the demands for relevance and cultural sensitivity of the new, OBE, curriculum framework and the theoretical proposition, within the present study, for change and the generation of new learning and new cognitive procedures for school-specific forms of knowledge.

One the crucial questions for Socio-cultural research involves schooling and curriculum congruency with learners' spontaneous knowledge and cultural practices. Matusov (2006) observed two interpretive approaches arising from the post-Vygotskian Socio-cultural research tradition. The first, largely American, was associated with the interpretive framework that emphasized the accommodation of cultural diversity by

ensuring that formal schooling, and the curriculum, included cultural practices and patterns of learning and development of culturally diverse learners (see, for example, Cole, 1995; 1988; Cole and Brunner, 1971). This approach is contrasted with the interpretive approach, largely South African (e.g. Moll, 1995), but deriving, in Matusov's view directly from the Vygotsky-Luria framework that holds that spontaneous, cultural practices are inherently inadequate for formal school learning and development and therefore need to be transformed. From the perspective of the South African approach, a solution to the problem of learning and development on the part of learners would involve devising pedagogical strategies and designing effective curricula to change learners' inadequate learning and developmental outcomes of their cultural settings and everyday-life situations (cf. Moll, 1995; 1994; Craig, 1989; 1987). This approach would probably contrast the cultural relevance principles of the new, OBE curriculum framework in South Africa. The alternative approach ascribed to research by Cole (1995; 1988) and others, which accommodated cultural diversity and the related learning modes into learners schooling and developmental outcomes, seems relevant for the current South African curriculum framework. This, however, is not without problems as the approach was criticized for its potential to deny learners the tools for effective engagement with formal knowledge and success in a Western socio-economic setting, for which schooling prepares learners (Matusov, 2006; Moll, 1995; Miller, 1985; 1984).

The South African approach was however not oblivious to the ethnocentric implications and the theoretical contradictions that its interpretive framework involved. As Craig and Miller (1984) have observed:

> Cole (1982) asserts "that no universal notion of a single general ability, called intelligence, can be abstracted from the behaviour of people whose experiences in the world have different life predicaments handed down to them in their ecocultural niche" (p.710). I am, as would be any reasonable person, in complete sympathy with Cole's fears that if this is not recognised, some cultures will be unfairly judged against "ethnocentric claims" (p.710) about reality. When this "reality" refers to certain conceptions of mind, the relationship between mind and

> culture becomes the theoretical battleground, and the socialization of cognition the process, which cleaves open the debate (Craig and Miller, 1984: 21).

In an attempt to engage with the contradictions involved between theory and the practice of education in contemporary South Africa, it is suggested that learners are provided with adequate cognitive tools and guided towards mastery of the formal, scientific knowledge and modes of learning so as to succeed in the tasks of formal schooling. However, this does not necessarily suggest that the inclusion of cultural knowledge will serve to constrain the developmental acquisition of the scientific concepts and theoretical modes of learning. Hedegaard's (2002; 1996; 1990) study, discussed in Chapter 2, illustrated the potential for including societal and cultural forms of knowledge and using these as basis for guiding learners towards the acquisition of the formal, scientific and theoretical forms of knowledge. Learners, from the perspective of this study, are guided to see the contradictions that underlie the different forms of knowledge and made to understand the cognitive procedures and modes of learning that characterize the two, distinct forms of knowledge.

The regulation of the developmental relations between the two distinct conceptual systems—involving the formal, scientific, and the everyday, spontaneous and cultural forms of knowledge and concepts is, therefore, viewed as the fundamental responsibility of the institution of schooling. Through its teachers and curriculum processes, such conceptual relations are regulated at appropriate points of socio-cultural contact, encapsulated by the theoretical notion of the zone of proximal development. Through the application of the ZPD, as illustrated in the discussion of the application of this concept in Chapter 2 and below, the teacher should be able to reveal the fundamental contradictions underlying the formal, school-specific forms of knowledge on the one hand and the non-school, culturally-derived, spontaneous systems of knowledge and concepts on the other hand. In this way, the teacher guides her learners towards the acquisition of new concepts and modes of learning within the tradition of formal schooling. As a result, culture, even indigenous cultural practices, is given new vitality within the knowledge practices and modes of learning of formal schooling. Meanwhile, learners acquire new forms of understanding of their familiar,

everyday-life experiences and new analysis of their life-worlds.

5.6. Recommendations: Application of the “zone of proximal development”.

The present proposals for improving the socio-cultural conditions of teaching and learning in South Africa and Venda involve the extension of the theoretical approach discussed above to its application to children’s learning and development in their everyday, spontaneous learning and developmental situations in their culture, children’s learning and development in primary school and curriculum development initiatives for the present South African schooling and society.

The present schooling and classroom teaching and learning suggest that the past continues to be reproduced, albeit in new forms, in the present practices. The new curriculum, in itself, did not provide sufficient tools for teachers to overcome the limitations in their practice that the apartheid schooling system had generated in the past forty years.

Additional, if not new, conceptual tools are needed, especially at the level of classroom practice, to enable teachers to fully understand the limitations imposed on their practice by the past schooling and political system and to enable them to overcome those limitations and create new learning and development for their pupils. Such tools would need to involve a new understanding by teachers, of their changed classroom roles with regard to the mediation of knowledge to their pupils. For example, the notion of mediation is proposed in the post-apartheid South African curriculum framework, but this is not adequately elaborated so as to provide teachers with an adequate conceptual understanding of what it actually means to be a learning mediator.

As we have seen in the description of the lesson excerpts in Chapter 4, the common understanding involved the idea of teacher accepting pupils’ views and not suggesting his or her own views to guide pupils learning towards an adequate conceptual understanding of the subject matter. An instance of this was, for example, the introductory part of the Grade One lesson (see appendix 3.1.). The teachers’

instructional approaches, making use of the new OBE instructional procedures but continuing to hold notions about the nature knowledge and learning that derived from their past practices, failed to create new learning and development for their learners. In these lessons, more emphasis was placed on the new concepts and pedagogical procedures of the new curriculum framework while the distinct nature and the internal contradictions between the formal, scientific concepts and the everyday, spontaneous concepts were not revealed to learners. Meanwhile learners failed to distinguish clearly between the contradictory forms of knowledge and their cognitive procedures. As a result, as exemplified by their performance of the experimental tasks, learners used contradictory problem-solving methods without the awareness of the contradictions.

The present proposal for an application of the theoretical notion of the zone of proximal development, discussed in detail Chapter 2, posits that this theoretical tool would enable teachers and curriculum development processes in school to reveal, to learners, the fundamental distinction and the underlying contradictions between the school-specific and the everyday, spontaneous and culturally derived forms of knowledge and their cognitive procedures. Following this proposition, the discussion below focuses on the areas of application of the concept of the zone of proximal development to address the problems of teaching and learning and cognitive development and functioning the present study has identified. There are three related areas of possible application of the concept of the zone of proximal development that are addressed below, namely:

- Pre-school learning and development
- Primary school learning and development, and
- Curriculum design and development

5.6.1. Pre-school learning and development

It is important to understand the relationship between children's learning and development during the years before schooling because most of the problems that children experienced when they begin school derived from the tension between their pre-school learning and development on the one hand and the demands of formal school learning on the other. Concomitant with these problems are the problems of the

lack, on the part of the teachers, of the appropriate pedagogic methodologies for addressing this tension.

Research on children's pre-school learning and development in their specific socio-cultural settings would provide important information for teachers about the learning and developmental potential of these children. An examination of children's spontaneous learning in their everyday cultural settings would provide teachers with insight into their learners' spontaneous concepts and cognitive processes, necessary for effective organization of classroom teaching and learning activities and for the provision of adequate learning opportunities to these learners.

Craig (1985), for example, conducted a study looking at the cultural origin of dyadic patterns between Zulu mothers and their pre-school children. Her finding that the dominant interactional structure between the mothers and their children followed a culturally derived pattern would be informative for teachers and curriculum designers. The application of the zone of proximal development to improve teaching and learning and the consequent cognitive development in such a situation would involve aligning the curriculum and classroom practice in such a way that the cultural patterns are harnessed to benefit pupils' formal learning and concept acquisition. This does not suggest a mere extension of the spontaneous, everyday concepts and modes of learning. Classroom practice, according to this view, should be aimed at transforming the spontaneous, everyday cultural knowledge and concepts and create new learning and development on the part of learners. It should, in other words, exploit the experientially rich empirical knowledge and concepts that children bring into the classroom and aim to transform it into new, scientific and theoretical concepts and knowledge characteristic of formal schooling.

A similar example could be derived from the Grade One lesson discussed in Chapter 4. In this lesson situation, children's spontaneous and everyday, cultural knowledge that they bring to bear into their classroom learning comprised their knowledge of the concept of name as only involving the naming words that refer to specific names of people, excluding words that identify classes of things such as "bird". The teacher's

insight into the spontaneous conceptual system that informed here learners participation in the task could have made her organize her learners' learning experience differently, in a way that would have enabled them to realize that the concept of naming they were learning was fundamentally different from that which they had already mastered in their pre-school, everyday learning situations. That is, the teacher's activities would have been oriented towards making the fundamental conceptual differences between the two forms of knowledge explicit to learners, so that they understood that the concept of 'naming', specific to formal schooling, was more abstract, subsuming a much wider range of ways of naming that its more limited sense that they had acquired in their pre-school learning situations.

Meanwhile, further potential exists for curriculum research and development. Curriculum could be developed to facilitate effective relationship between the school specific formal, scientific concepts and everyday, spontaneous as well as culturally shaped concepts and modes of learning and thinking. This proposal relates to attempts to make the curriculum congruent with learners' cultural knowledge and experience. Congruent, of course, not in the sense of the curriculum extending learners' everyday and culturally-shaped forms of knowledge and learning but in the sense of curriculum enabling learners opportunities to apply the scientific and theoretical modes to analyse their familiar, everyday forms of knowledge. The Geography lesson, discussed in Chapter 4, for example, could have emphasized the general explanatory principles and rules (as did the Social Sciences lessons by Hedegaard (1996; 1990) discussed in Chapter 2) and encouraged learners to apply these rules to the specific context of their familiar social setting. Further comparisons of their specific setting to a wider range of similar social settings would enable learners to acquire, not only the content, but also the underlying concepts for analysis and explanation of the subject matter of their learning.

Wertsch's (1984) discussion of mediation and the zone of proximal development provide an instance of pre-school instructional patterns. In his study (see Chapter 2 for a detailed discussion), Wertsch discussed how adults provided strategic guidance to children for them to complete the tasks. The task situation involved the children

constructing a copy object of a model under the guidance of their mothers. Children's decisions about the appropriateness of each individual piece were guided by the model, which served as the ideal towards which their problem-solving activity was directed. However, the final products were always the results of the children's own individual actions. In this way, mothers provided their children with critical, socially mediated skills for creating their own copy objects. The skills lay, as will be seen in the examples of school tasks below, in children's zone of proximal development for their future learning and development within formal schooling.

The social and cultural setting of learning and development during the pre-school years of children in Venda differed considerably from that which pertained to their formal schooling. The two contexts of learning and development provided different developmental trajectories for children participating in the learning activities that they afforded them. In their pre-school learning, these children learnt through the medium of TshiVenda and therefore acquired forms of concepts that were shaped by their language and culture. The forms of thinking and concepts that occurred in this developmental trajectory differed fundamentally from that represented by formal schooling. That is, the cultural context of the Venda child's pre-school learning did not sufficiently support his or her later activities of formal, classroom learning and development. The TshiVenda language structure, discussed in the section on Classification and Generalization Tasks in Chapter Three, did not support the formal, conceptual thought processes that characterise formal schooling. That is, TshiVenda simultaneously deployed both abstract and functional systems of classification and was therefore structured differently from English, from which the experimental tasks were translated. These different conceptual systems, encapsulated by language, revealed fundamental differences in the Venda socio-cultural context of learning and development and the context and learning demands of formal schooling. This fact supports the proposition that knowledge and insight into the specific, pre-school, cultural context of learning and development would be important for designing effective curriculum and classroom teaching and learning activities.

Taking these factors into account, the development of learners' home language for classroom teaching and learning purposes becomes crucial. The language medium for classroom teaching and learning, especially TshiVenda as it was used in the Foundation Phase and partly in the Intermediate Phase, needs to be developed to meet the conceptual demands of the formal, scientific forms of knowledge. For example, the word *"dzina"*—for "noun", in the Grade One lesson discussed in Chapter Four, has an equivalent meaning to the word "name", as used in TshiVenda everyday language context. The word therefore introduces no conflict or contradiction between the distinct meanings that it has in spontaneous, everyday situations and in formal school, scientific learning situations respectively. That is, if a word does not explicitly engender an awareness of the underlying contradiction in the conceptual relations involved between spontaneous and formal concepts, the word might be resistant to conceptual change that it must foster when learnt in formal schooling. Further research on the conceptual structure of TshiVenda, and perhaps the other indigenous languages in South Africa, and its efficacy for formal instructional purposes and concept acquisition would therefore be crucial. Such research could be critical for the development of these languages for effective classroom teaching and learning.

Wertsch's (1984) example, described in Chapter Four, involving mothers guiding their children on appropriate problem-solving strategies posits a similar conceptual problem regarding two distinct forms of mediational processes. The first mediational process or method of teaching involved what Wertsch (1984) refers to as *Action Pattern 2*. In this mediational process, the child had no awareness of the structure of the task and was not aware of the criteria that should guide his actions towards the completion of the task. The child's actions for completing the task were carried out on the basis of a trial and error method. There was no clear conceptual system that guided the actions of the subjects in the completion of the task. As a teaching approach, this might involve the use of directives or verbal instructions, such as in the case of the 'telling method' or verbal transmission method that characterised, for example, the Grade Six Geography lesson discussed in Chapter 4.

This approach, defined as the empirical epistemological procedure by Hedegaard (2002: 1996; 1990) characterises much of the spontaneous, pre-school learning. The approach is dominated by learning through observation and imitation. It is an approach that differs fundamentally from that which characterises formal learning in school. Its emphasis on the concrete and empirical nature of knowledge and learning modes means that it is not sufficient for the formal, scientific knowledge and learning. The everyday, spontaneous concepts and forms of knowledge would for example not be adequate for the formulation of models through which the complexity of scientific phenomena is represented. Classroom teaching and learning must foster the transformation of these concepts and modes of learning to generate, on the part of learners, new, formal and scientific conceptual tools for perceiving and thinking about phenomena in their life world.

5.6.2. Primary school learning and development

The first years of schooling comprise an important formative period in the child's learning and development. During this period, much of children's playing time is taken up by the demands of formal learning in school. In school, children find themselves subjected to longer periods of sitting inside the classroom among a large group of other learners. One adult, the teacher, is responsible for teaching them new ways of doing things, which involve reading, writing, counting and working with numbers. Learners have to pay attention to the teacher and concentrate on the learning tasks for longer periods of time than they did before schooling. Meanwhile, children begin to learn to organise their life activities according to the new demands for formal schooling. They are required, for example, to wake up at a certain time in the morning to prepare themselves for going to school, they are required to make provisions for time after school for study and completing the homework. All these comprise enormous shifts in the life world of a child, more so for the majority of children in Venda for whom the Grade One class comprised the very first year of formal school learning.

The Grade One children begin learning to read and write and to work out simple arithmetic operations. Teachers sometimes began, even in contravention of the school

policies, to introduce learners to reading and writing in English, early on during their first year of schooling. This clearly is not an easy leap for children who have to make significant adaptations to the demands of schooling. While Grade One children adapt to the demands of their society for schooling, they also face the demands to change their modes of learning to acquire new forms of knowledge specific to schooling. Some of the personality and cognitive qualities that the Grade One learners are forced to change during their first year of schooling include impulsivity, inattentiveness and egocentrism, etc. While the new demands of school learning transform most of these processes, it is the spontaneous processes of learning and development that seem not to be successfully transformed through the teaching and learning processes. The application of the concept of the zone of proximal development has the potential to foster meaningful relationship between the spontaneous and theoretical concepts and modes of learning, to bring about new learning and development on the part of learners.

Classroom teaching and learning in the two primary schools in Venda failed to generate abstract, theoretical knowledge because they relied on inadequate mediational processes. That is, the methods of teaching and learning that were used were not adequate to the demands of the formal, scientific tasks that the subject matter knowledge constituted. These mediational methods, or cognitive procedures that dominated classroom practice, perpetuated the modes of learning that the children had already mastered before schooling, during their spontaneous, everyday learning situations. The mediational process of classroom teaching and learning did not engender change in the learners existing, everyday, spontaneous concepts and modes of learning.

Wertsch's (1984) *Action Pattern 1* mediational processes discussed in Chapter 2, although carried out with pre-school children in the original study, represent an approach that teachers in the present study could adopt to improve on their current practices. The utility of this approach is primarily in its ability to make the principles and criteria that underpin the task activity explicit to learners. That is, the teacher guides her learners with the primary goal of getting them to understand the criteria, methods, principles and concepts that underlie the task rather than leading pupils into correct

action reproduction without this understanding. In this study, the appropriate strategies for producing correct problem-solving actions, based on the understanding of the task's underlying concepts, are emphasized. The methods for producing appropriate learning actions, rather than the product itself, are emphasised. Learners' understanding of the reasons for specific actions is, in itself, a prerequisite for competent learning activities. That is, learners understand the task activity and how it may be similar to, and different from, the related activities with which they are already familiar. In this way, learners come to a deeper understanding of the relations and contradictions in phenomena.

For example, the literacy lesson observed in Grade One, discussed in Chapter 4, emphasized the production of correct performance involving the number of sound patterns in a given word, without learners understanding the basis for identifying one sound pattern from the other. The Grade Six Geography teacher, also discussed in Chapter 4, read out the text to his learners and emphasised the reproduction of correct answers from the textbook without regard for his learners' understanding of the text. As a result, learners acquired the formal, scientific knowledge in the same way in which they had acquired the spontaneous, everyday forms of knowledge and concepts. In this way, the formal concepts and forms of knowledge were never brought into meaningful relationship with the learners' pre-existing spontaneous knowledge.

As Tharp and Gallimore (1988) and Tulviste (1991) have suggested, the formal, scientific and theoretical practices of schooling may be incongruent with the cultural zone of learners' spontaneous, everyday activities. This situation may produce a level of disadvantage on the part of learners from a cultural background that is incongruent with and does not support the learning activities of formal schooling. Elkonin (1971), in Hedegaard (1996; 1990), has argued that the child's development arises out of a clash between the child's own activities directed by his or her individual needs and interests on the one hand, and the demands and traditions of his or her society on the other hand.

The demands of a society in transition may have the effect of a multiple developmental zones in children. The cultural practices of such society may emphasise some practices

that may be in direct conflict with the formal practices of schooling. For example, the Grade One teacher, discussed in Chapter 4, engaged her learners in learner-centred, active learning practices. One such practice involved the socially relevant democratic practice of decision-making through casting votes. While teaching learners the values of democratic decision making processes may be valid and relevant for purposes of fostering appropriate social values, this procedure was inconsistent with the present task demands. Conceptual problems cannot adequately be addressed through the specific procedural method the teacher has chosen for her learners. The cognitive-theoretical epistemological procedure for problem solving would be appropriate for resolving the task problem. Learners were supposed to be guided by the teacher into an understanding of the rules for determining the different sound patterns in words so that they could be able to apply these rules on their own for solving this and similar problems.

The conflict between the teacher's chosen pedagogic procedure for this task and the pedagogically sound procedures for deciding on correct solutions for task problems is obvious. Meanwhile, learner-centred and active learning pedagogies were not used, during this lesson, to facilitate meaningful and independent learning—outcomes which would be associated with such pedagogical methodologies. Instead, the teacher fore-grounded the rote memorisation of the lesson content as she presented it and never engaged in a meaningful way with her pupils. That is, the product of the lesson, correct task performance by the learners, rather than the essence of formal learning activity the understanding of the reasons, principles and criteria that form the basis of competent performance actions, was emphasised.

The application of the concept of the zone of proximal development to classroom teaching and learning could enable teachers to guide learners' towards the acquisition of the general rules and principles for thinking and relating to the formal, scientific knowledge during schooling. The acquisition of these rules would enable learners to analyse their everyday life worlds using the new concepts and modes of thinking that school learning has generated.

Classroom teaching and learning can be formulated to include real life questions that children naturally ask themselves. This would involve, for example, questions about life, growing up, questions about time and relations, etc. Such questions and problems would however not be presented to learners as if they pertained only to formal schooling, in isolation of their manifestations in learners' spontaneous, everyday life worlds. Through this approach, as discussed by Hedegaard (2002; 1996; 1990) and Arievich and Stetsenko (2000) respectively, learners can be guided into adopting new modes of thinking and new concepts that are appropriate for exploring the subject matter of their learning. The concepts are not transferred to learners through verbal transmission, but generated through learning activities that foster the understanding of the rules through which the subject matter can adequately be conceptualised. These activities are guided by teachers', in the learners' zone of proximal development. The relations between what learners already know about the subject matter and what they do not as yet know determine the ZPD. The teacher guides learners' learning through planning the learning activities that reveal the contradictions between what learners already know and what they do not as yet know about the subject matter. This involve guiding learners into the acquisition of more powerful conceptual tools for understanding the subject matter in all its complexity and not just its superficial manifestations as was the case with the Geography lesson discussed in Chapter 4.

This approach could be used for classroom teaching and learning improvement and curriculum development, expanding on the pedagogy of the South African Outcomes Based Education. Rather than classroom practice reproducing learners' everyday and spontaneous modes of learning, the present approach posits a methodology that explicitly requires the teacher to guide his or her learners towards the learning and acquisition of new cognitive procedures for the school-specific theoretical forms of learning. Meanwhile, rather than emphasizing verbal transmission mode of teaching, the present approach posits a pedagogical method whereby the teacher involves learners in new learning. The new learning involves the teacher engaging learners in the learning and acquisition of the rules and principles of theoretical, scientific explanation using activities and objects in the learners' everyday, cultural setting. Learners also acquire, through this approach, new modes of analysis of their familiar,

everyday and cultural forms of knowledge. Further, learners acquire the awareness of the contradictions between the methods employed by their everyday, spontaneous knowledge on the one hand and the theoretical and scientific modes of knowledge and learning on the other hand. The approach should also generate, on the party of learners, psychological tools for formal school learning and development which, following Hedegaard (1996), involve:

- Ability to distinguish between what is already known from what is not known about the topic or problem
- Ability to establishing the most appropriate methods of enquiring on what is not known
- Ability to identify appropriate resources to be utilised as relevant sources of information
- Ability to model problems and to formulate further models that adequately represent existing knowledge about the subject matter
- Ability to engage in activities aimed at exploration of problems
- Ability to analyse knowledge obtained during exploration of problems and issues, and
- Ability to evaluate the knowledge that learners formulate through their exploratory (learning) activities.

Teachers may generate further psychological tools and apply them into their learners' learning. These tools must contribute to learners' acquisition of the new knowledge and new modes of learning during schooling. For example, in a teaching experiment that focused on the subject of the evolution of species, Hedegaard (2002; 1996; 1990) modelled the core concepts around evolutionary changes in nature and in animals. The models revealed a scientific account of this phenomenon. They illustrated the principles of natural selection and adaptation by guiding learners through exploratory activities. The teacher's role involved guiding the learners' exploratory activities towards the acquisition of the scientific-theoretical forms of knowledge. Hedegaard's approach is consistent with that developed by Gal'perin, in Arievich and Stetsenko (2000), discussed in Chapter 2.

The notion of scientific and theoretical forms of knowledge and concepts used in the present study should however not be confused with the predominant view of knowledge during the apartheid schooling system in South Africa, where scientific knowledge was assumed to refer to the static view of science and factuality of knowledge. This form of knowledge was represented in the official textbooks and informed classroom practice (Pell, 1998). The present study considered the reproduction of such beliefs and assumptions about knowledge within the new, Outcomes Based Education, curriculum as impeding meaningful change and classroom improvement. Arievich and Stetsenko (2000) posited a model that further illustrates the developmentally oriented approach for primary school pedagogy. In their study primary school pupils were introduced to the concept of number and the related concept of unit, through engaging them in the learning activities that generated such concepts. Through engaging learners in activities involving measurement of objects around them, for example, learners were guided by their teachers towards the acquisition of the concept of number and the related concept of unit as a basis of measurement. The activities not only model the scientific notion of a number concept but also proceed from learners' everyday, familiar activities. Through these activities that involved the measurements of objects and the exploration of their qualities, learners acquired the idea of unit, as a conceptual tool for determining the different measurements of objects.

In the lesson discussed by Arievich and Stetsenko (2000) (see Chapter 2 for a detailed discussion of this lesson), the concept of a unit for measurement as a scientific idea did not have to be taught to learners in abstraction, without relating it to related concepts in learners' everyday activities. Measurement was viewed as an essentially human form of social activity that also characterised the activity of human beings in all situations as they conceive the differences and similarities in size, quantity, volume, mass, etc. Measurement occurs in everyday, spontaneous situations without participants necessarily realising it as such or using the formal concepts to identify the specific measures. Relating the activity of formal school learning of concepts with learners' everyday life and culturally shaped learning activities makes the problem area of their learning meaningful. This approach should also help learners realise the efficacy of the scientific concepts and the theoretical methods in solving school-specific scientific

phenomena and eventually, real life problems in their everyday life situations.

5.6.3. The zone of proximal development and curriculum development

The new South African outcomes Based Education curriculum sought to overturn the legacy of the past, apartheid schooling and to bring about new practices of schooling and classroom teaching and learning that were consistent with the new, post-apartheid socio-political dispensation. The new curriculum provided a radically new setting for the practice of schooling in South Africa and the changes it introduced had far reaching consequences for the post-apartheid schooling and classroom teaching and learning. However, with these changes, much of the practices of the past schooling and curriculum practices continued to be reproduced in the new schooling system.

While there was evidence of the changing practices of schooling and classroom teaching and learning that directly resulted from the introduction of the new curriculum framework, such changes tended to reproduce the past forms of the teachers' practices into their present practices. For example, the Grade One lesson, discussed in Chapter 4, made use of the principles of the new curriculum on how teachers should relate to their learners and how the activities of classroom teaching and learning needed to be organized. However, these pedagogic procedures did not stop the teacher from reproducing the past practice involving verbal transmission of knowledge to get learners to acquire subjects matter knowledge as *empirical knowledge*, without understanding the underlying conceptual relations and the general rules and principles for determining, for example, the different sound patterns in words or the different naming words and their essential characteristics. This suggests that curriculum development needs to take into account the context in which the envisaged changes take place. That is, the relationship between the past forms of schooling and classroom teaching and learning and the new, envisaged practices of the new curriculum, need to be organized more effectively through the application of the zone of proximal development.

The application of the zone of proximal development to improve curriculum implementation would involve the development of learning programmes that emphasize the qualitative differences between the previous, apartheid practices and schooling and

classroom teaching and learning on the one hand, and the new practices proposed in the present curriculum framework on the other hand. These qualitative differences were never clarified in the previous, apartheid curriculum and learning support materials. Here, classroom teaching and learning was assumed to involve a continuation and extension of the methods of acquisition of the everyday, spontaneous forms of knowledge.

Although the OBE curriculum posits radical changes in the procedures for classroom relations and for the organisation of learning activities, it makes no clear distinction between the formal, school-specific, scientific and theoretical forms of knowledge and its distinctive cognitive procedures on the one hand, and the everyday, spontaneous forms of knowledge and its associated epistemological procedures on the other hand. Furthermore, OBE suggests that learners' previous, non-school knowledge and experience, as well as cultural knowledge, can be extended into school knowledge and formal, classroom teaching and learning. Herein lies a fundamental limitation of the new South African OBE curriculum, which accounted for the problem of the reproduction of everyday, spontaneous forms of knowledge and the past, apartheid practices of classroom teaching and learning into the present, post-apartheid schooling and classroom teaching and learning.

Apartheid schooling did not make the distinction between the methods and procedures of everyday learning and those of formal schooling, which led to the predominant use of the methods of everyday learning for school-specific forms of knowledge during classroom practice. Meanwhile, the everyday forms of knowledge and concepts were not brought into meaningful interaction, and transformational relationship, with the formal, school knowledge and concepts, as would be possible through the application of the concept of the zone of proximal development.

The new, OBE, curriculum in a way of reversing the practices of the past, apartheid schooling and classroom teaching and learning de-emphasized and underspecified subject matter content. This resulted in uncertainties on the part of teachers on what subject matter content should be covered in specific levels of schooling (Chisholm, et al.

2000). As a result, subsequent curriculum revisions, that resulted in the Revised National Curriculum Statement (RNCS) currently in use, specified content albeit still avoiding content over-specification that characterised the apartheid curriculum. A dilemma regarding subject matter content therefore ensured. To specify content, even by way of illustration, or only specifying core concepts of a subject matter discipline, as the new RNCS suggested (DoE, 2004), has the potential, within the present educational environment, of engendering content reproduction in ways that characterized the past, apartheid schooling. Meanwhile, leaving content specification completely outside of the curriculum statement may have unintended consequences, implying that “anything goes” (Chisholm, et al. 2000).

The application on the concept of the zone of proximal development to address curriculum development around subject matter and disciplinary content would involve a consideration of the contexts of teachers’ practice and learners’ learning. That is, the availability of resources that support classroom teaching and learning, the level of confidence and knowledge that the teachers have on the subject matter and disciplinary content, as well as the effectiveness of teacher support and teacher development programmes would bear on any such decisions. Ultimately, irrespective of which decisions are taken regarding the learning content, teacher expertise, in terms of teachers having sound knowledge both of their subject matter and disciplinary content, as well as of the knowledge and awareness of appropriate epistemological (or cognitive) procedures pertaining to the learning and teaching of such knowledge, would be crucial as a basis for schooling and classroom teaching and learning improvements.

5.7 Conclusion

The current study has examined the relationship between the present practices of schooling and classroom teaching and learning and its cognitive consequences on the one hand, and the evolving sociocultural-historical context in which schooling is embedded on the other hand. The analysis of wider socio-historical context of the rapidly changing educational setting in South Africa provides important insights into the realities of schooling practices in Venda, that manifest both, continuities with the past

practices of society and schooling and some profound transformations, leading to a complex and multidimensional picture of cognitive development in children.

The present study is grounded on Socio-cultural theory, originally formulated by Lev Vygotsky and currently enjoying unprecedented reception in contemporary scholarship in developmental psychology, emphasizing the interrelations among learning, instruction and development. The theoretical analysis led to the formulation that the present practices of schooling and classroom teaching and learning reproduce and continue larger socio-historical processes, constituting the context in which cognitive development takes place and becomes shaped.

This formulation made it possible to draw substantive links between the observations on the history of schooling in South Africa in general and Venda in particular on the one hand, and the current situation with the practices of classroom teaching and learning and their cognitive consequences. The present study concludes; extending the prevailing socio-cultural theoretical formulation, that even the socio-cultural contexts characterized by strong ruptures, such as in South Africa, nonetheless continue some vestiges of the past practices that affect learners' learning and cognitive development. The social and cultural setting of schooling in Venda manifests, in its present conditions, instances of the indigenous practices of the specific cultural traditions, the religious traditions of 19th and 20th century missionary practices and the traditions of the apartheid societal and schooling practices. The past, socio-cultural traditions and practices of schooling and society are instantiated in today's, evolving practices of schooling and classroom teaching and learning, creating conditions that simultaneously constrain and make possible the developmental transformation of the present practices of schooling and classroom teaching and learning. The empirical examination, in the present study, of the practices of schooling and classroom teaching and learning supports this formulation.

The findings provide crucial insights to further our understanding about the regularities of the socio-cultural influences of cognitive and conceptual developmental processes taking place in the course of formal school teaching and learning in conditions of rapid

social change. From these findings, the study makes important recommendations for improving the conditions of schooling and classroom teaching and learning of today's students in Venda in particular, and South Africa in general. The recommendations are premised on Vygotsky's concept of the zone of proximal development, and how this concept can be utilized for developing educational practices grounded on sound psychological knowledge of the relations among formal school learning, instruction, and cognitive development.

Children's development in school is orientated towards the mastery of school-specific forms of knowledge and learning, transforming everyday, spontaneous forms of knowledge and learning and progressively creating new zones of proximal development for further learning and development of the scientific, theoretical forms of knowledge. The teacher, as mediator, is positioned within the tradition of scientific-theoretical knowledge and learning, into which he must induct his learners. It is the teacher's regulation of the relations between the scientific-theoretical concepts and forms of knowledge on the one hand, and the everyday, spontaneous concepts and forms of knowledge on the other hand that learners must internalise. The mastery of the scientific-theoretical concepts and modes of learning, necessarily, transforms the everyday, spontaneous knowledge and forms of learning and enables new analysis and new forms of understanding, by learners, of their everyday life-worlds. These conceptual relations are subsumed by Vygotsky's revolutionary concept of the zone of proximal development and its application to pedagogical situations and curriculum development processes.