DEVELOPING SELF-REGULATED LEARNING THROUGH THE USE OF META-COGNITIVE STRATEGIES IN ADVENTURE-BASED ACTIVITIES.

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IAN WILLIAM GALBRAITH

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Abstract

This research investigates the benefits of adventure-based activities used as a learning experience at school level. In order to scientifically investigate these benefits the study is located at a school where an adventure-based programme is being developed as part of the school's curriculum. This programme consists of a range of adventure type experiences including, rock climbing, abseiling, canoeing, mountain biking, group dynamic activities, survival camps, ropes courses and adventure racing. At Lilyfontein School these activities form part of the Life Orientation and Life Skill programmes from grade 1 to grade 11. Specialized and qualified staff are used to conduct some of these programmes.

Adventure-based activities are rigorous and contain elements of risk which require problem solving, good decision making and sound emotional management. These aspects present both physical and mental challenges to any participant. This study postulates that learners engaged in these adventure type activities are faced with using meta-cognitive strategies to help them through these mental and physical challenges. In doing these activities regularly learners will develop meta-cognitive strategies that will enable them to become better self-regulated learners. A self-regulated learner is able to use meta-cognitive strategies like problem solving, decision making, self-evaluation, self-monitoring, self-reflective thinking or emotional control in life generally.

The aim of this research is to conduct an on-going action research study of the adventure-based programmes to determine their worth for the learners at Lilyfontein School and consequently the future of such experiences in a school's curriculum. This forms the primary goal of this research. The secondary goal is to gather valid and reliable evidence required to make an argument for the School's Governing Body (SGB) and Curriculum Development Committee (CDC) to be able to substantiate decisions relating to any such future programmes.

This research regards the school context as the activity system which forms a primary case study. In order to extract maximum information from this educational system, embedded case studies will be conducted and monitored. These embedded case studies will be made up of the following groups of people: firstly the learners engaged

in a variety of adventure-based experiences, secondly the educators as they observe and perceive the consequences of these experiences, and thirdly the parents as they identify possible influences of adventure-based experiences on the behaviours, beliefs or habits of their children.

In this research study data collecting techniques are used to extract information from the embedded cases. Information is elicited from parents and educators through the use of questionnaires and interviews. For learners, narratives and interviews are used to get a more qualitative sense of their beliefs and feelings on adventure-based experiences. However, in order to capture and document the learners' use of meta-cognitive strategies as they engage in the rigours of an adventure-based activity a more empirical approach is used. This approach uses in-depth observation, recording and measuring of the learners in action. Video footage is used to record the learners' reactions as they battle with fear, mental-strength, fatigue and decision making to accomplish their goal during an adventure activity. This study claims that an adventure-based experience helps to mediate the learning that will develop self-regulatory strategies in a learner.

The limited research in the adventure-based learning field and more significantly the lack of empirical evidence of how meta-cognitive strategies form a crucial component of adventure-based activities has meant that the researcher has developed his own recording, measuring and analytical tools to serve this end. He has chosen to use Engeström's third generation Activity Theory model which provides a useful underlying theory as well as an analytical and interpretive framework for this study.

The research was conducted over a period of three years. Findings are considered in relation to the National Curriculum Statement for the GET and FET bands to ensure its relevance in the school context to the National Department of Education's expectations for the Life Orientation curriculum. The empirical findings of this study at Lilyfontein School and their relevance to the curriculum content of the National Curriculum Statement ought to provide convincing data for very important curriculum policy decisions at Lilyfontein School and in the broader educational context.

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List of Acronyms

ABC..... Adventure Based Counselling

ABE..... Adventure Based Education

ACA ..... American Camping Association

AEE..... Association of Experiential Education

ARA .....Adventure Recreation Association

AS.....Assessment Standard

CDC..... Curriculum Development Committee

CO..... Critical Outcomes

DO..... Developmental Outcomes

DoE ..... Department of Education

EE..... Environmental Education

FET..... Further Education and Training band

GET ..... General Education and Training band

LO..... Life Orientation

LO ..... Learning Outcomes

MCE..... Meta-Cognitive Element

MCI..... Meat-Cognitive Indicators

MCS..... Meta-Cognitive Strategy

NCS..... National Curriculum Statements

NGO..... Non Governmental Organisation

NMU..... Natural Meaning Unit

NSGA..... National Sporting Goods Association

PAR..... Participatory Action Research

RAMS ..... Risk Analysis and Management Systems

RCL ..... Representative Council of Learners

RNCS..... Revised National Curriculum Statements

SGB ..... School Governing Body

SMT..... School Management Team

ZPD..... Zone of Proximal Development

Glossary of significant terms.

Activity theory … the socio-cultural view that cognition or learning extends beyond the individual and arises in shared activity and interaction between people and their environment.

Affective learning … the learning of values, attitudes, emotional or psychological elements.

Adventure activities … activities like abseiling, canoeing, cycling, cross-country running, running, rock climbing, paddling, parachuting, mountain biking, hiking, etc.

Adventure racing … usually in teams with at least one of the opposite gender over a course including a series of adventure type activities, like running, cycling, canoeing, swimming, tubing, abseiling and zip wire.

Constructivist theory … posits that knowledge is not innate but is constructed through action and interaction between people and the environment.

Eco-challenge event … an annual event where adventure racing takes place between school teams as well as corporate teams.

Group dynamic activities … tasks done as group challenges which are used to develop co-operative, team building and leadership skills.

Inter-personal ability … the ability to get on with and interact with people productively and positively.

Intra-personal ability… the ability an individual has to cope with pressures, stresses or emotional challenges in a positive and productive manner.

Life Orientation … one of the Learning Areas in the National Curriculum of South Africa.

Mediation … something that facilitates or helps something else to happen or come about.

Meta-cognition … the process of thinking about one's thinking.

Meta-cognitive strategy … are strategies like planning, self-monitoring, self-evaluation, self-motivation, emotional control, task commitment, problem solving and decision making.

Outdoor recreation … outdoor activities done for enjoyment, e.g. hiking.

Outdoor Education … usually learning that happens in the outdoor situation

Reflective thinking … thinking about one's actions and the use of meta-cognitive strategies to evaluate, re-plan and make decisions to modify and improve a situation.

Primary Case study … the overall or larger system that is being studied; in this research into the Lilyfontein School system.

Secondary Case study … a study of one of the systems that make up the larger system, in this research the adventure component and life orientation curriculum of Lilyfontein School.

Embedded Case study … smaller case studies of the larger or primary case study; in this research the study of learners in action doing adventure activities, as well as educators and parents of these learners.

Self-regulation … the ability of a learner to use strategies like reflection, planning, self-monitoring, self-evaluation, decision making in order to be more effective learners.

Chapter 1

Introduction

Chapter one presents an overview to this study and describes the aims, goals and the research questions asked. This chapter also describes the rationale and structure of this thesis.

Historically, outdoor education formed part of the previous education system in South Africa and with the shift to Curriculum 2005 outdoor education did not feature strongly. However, while the concepts of environmental education and adventure-based learning have become more popular in current literature they appear to operate independently and are not mutually inclusive. Environmental education does not necessarily include adventure activities or *vice versa.*

Since 1987 a body called the Adventure Recreation Association (ARA) has attempted to regulate outdoor learning in South Africa. It is a voluntary, independent, non-political and non-governmental body with a constitution. Part of its mission is to promote a healthy life-style and active concern for the environment, through participation in outdoor recreation and adventure activities (ARA Constitution, 2004:1).

Although some research exists regarding adventure-based learning, its primary concern appears to focus on the effects of adventure experiences on the development of self-esteem, risk management and to a lesser degree the effects on problem solving and decision making. But there is very little empirical evidence to conclusively support such claims. The researcher has been unable to find any empirical research that has investigated the effects of adventure-based education on cognitive or meta-cognitive learning.

This research is concerned with the study of an adventure-based programme offered as part of the Life Orientation curriculum at a school in the Eastern Cape Province. In

particular this study investigates how adventure-based activities serve to enhance self-regulated learning.

1.1 Background to this study

South Africa is currently engaged in a process of revising its curriculum 2005, restructuring the NATED report 550 in both the General Education and Training (GET) and Further Education and Training (FET) bands. Outcomes Based Education (OBE) is the selected model of delivery for these curricula. The South African model of OBE has selected a constructivist approach to learning and constructivism generally casts learners in an active role (Perkins,1999:6-11).

The 2005 OBE curriculum does not address the concept of outdoor education or adventure-based programmes directly. The Revised National Curriculum Statement (RNCS), however, does mention outdoor education adventure programmes, leadership aspects, environmental education (EE) and recreational activities (RNCS policy, DoE, 2002a). No guidance to clarify the intended meaning or application of these statements is provided by the National Curriculum Statement (NCS) documents. This research will include an analysis of the National Department of Education's curriculum documents, i.e. RNCS (grade R to 9) and NCS (grade 10 to 12) (DoE,2002b). The analysis done in this study will extract the relevant elements from the Life Orientation curriculum that this research will address through the application of adventure-based activities in a school's Life Orientation programme.

Lilyfontein School, situated 21 kilometers north of East London, has a developing EE policy but is also piloting an "Adventure Leadership Programme". This programme incorporates adventure-based activities and is run as part of the everyday Life Orientation programme within the school's curriculum. The intention is to place learners in challenging situations that will help to mediate their learning so that they become more effective, self-regulated learners. Self-regulated learning is described by Schunk & Zimmerman (1994) as the process whereby learners systematically direct their thoughts,

feelings and actions towards the attainment of their goals. Self-regulation fits well with the notion that learners contribute actively to their learning and are not passive recipients of information (Schunk, 1994; 2000:355). This study claims that the rigorous and risk orientated adventure-based activities, with their contextually real nature, help to develop self-regulated learners. Adventure-based activities equip learners with certain meta-cognitive strategies that will help them to be better problem solvers to cope better with decision making and to develop their ability to handle anxiety. This can be observed in their improved self-esteem and their more self-confident participation. This means that developing these abilities may well serve to improve learners' meta-cognitive skills such as self-monitoring, self-reflection, decision making and problem solving. These are critical components in the mediation of learning that is required in the constructivist nature of the South African OBE curriculum.

Historically outdoor education, with its variety of definitions and applications, attempted to provide an alternative learning experience in South Africa and throughout the world (Darst, 1980). Ford (1981) lists seventeen different concept variations of outdoor education used internationally. There has, on the other hand, been a shift in the traditional form of outdoor education to a more adventure-based type of education. One of the problems in research is the lack of a clear definition of adventure-based education and the part that it plays in learning. Much of the current research in the adventure-based learning field looks at the development of self-esteem through experiential training.

Adventure-based education was pioneered by Dr Kurt Hahn through Outward Bound Adventure type schools in which outdoor pursuits are used within an experience of genuine (real) but controlled danger (Schoel,1988:38). Adventure-based activities could involve a range of activities like, abseiling, canoeing, rock climbing, parachuting, horse riding, cycling, high wire activities, high and low ropes courses, group dynamic and team building activities, raft building, bridge building, survival camps and adventure racing.

Characterizing these activities is a varying degree of risk in which participants are faced with the real consequences of planning, goal setting, decision making, problem solving,

managing emotions like fear and anxiety, conflict, reflective and reflexive thinking, self-evaluation and self-monitoring, to name a few. According to Schoel (1988:38) perceived risks and "impossible tasks" that are physically demanding are the important adventure experiences. Gair (1997:35) implies that fear is the key as participants face risks in dangerous but controlled situations. These risk-inducing activities, "... allow young people to develop by meeting challenges they do not necessarily face every day and to experience a sense of achievement in overcoming them" (HSC, 1995, as cited in Gair, 1997:36). At another level, Rosenthal's research on risk activities shows that a lack of risk activities may lead to depression as a result of the lack of norepinephrine in the brain. Norepinephrine is released in the brain during risk activity (Schoel *et al.*, 1988:52).

Constructivist teaching requires that instructional planning, activities and evaluation strategies must reflect how previously learned knowledge and experiences (prior learning) influence new learning (Caffarella, 1992:v). Constructivist teaching also believes that knowledge and values are actively constructed in the mind of the learner (Bodner, 1986:875). On the other hand Constructivism may range from a more internalized Piagetian approach to a more socio-cultural, Vygotskian, perspective which places learning within relationships and human action (Wertsch, 1993:8). Vygotsky claims that human action is mediated by tools and signs (Wertsch, 1993:28). **Tools** refer to the 'things' and **signs** the 'language' that the learner engages with in making meaning in any learning situation. **Tools** are of a material nature and are external (in this study they would include things like a climbing harness, ropes or the environment). **Signs,** on the other hand, are of a psychological nature and are internally orientated [and in this study would include things like, language, reflective thinking, emotions (John-Steiner & Souberman, 1978:124) and, I would add, *meta-cognitive strategies*].

In learning, culture and language all play a significant part in the construction and regulation of knowledge, skills or values. In this research adventure-based activities have particular tools and signs that serve to actively mediate the desired learning (Schunk & Zimmerman, 1994:350). In Wertsch's (1993:12) words any action is mediated by the cultural / psychological tools used to perform such an action.

Whitaker (1995) points to the shift in learning paradigms towards a more holistic and integrated form of learning experience where education strives towards a balance between the cognitive and affective (emotional) approaches to learning. Holistic education sees the purpose of learning directed towards being capable in the world rather than only knowing about the world (Whitaker, 1995:16).

Adventure-based education exposes the learner to a range of possibilities in different learning situations and conditions away from the classroom situation. Adventure-based learning seeks to increase the learner's capacity to operate in the world and attempts to find a balance between the four domains of learning: cognitive, affective, inter-personal and intra-personal learning, and in so doing to become a self-regulated learner. In Vygotsky's developmental theory, the child achieves self-regulatory capacities by actively manipulating the environment with the use of signs. However, the child's developmental progression on the road to self-regulation can also be seen as a social process (Diaz *et al.*, 1995:134).

1.2 The learner in adventure-based activities

The learner engaging in adventure-based activities will need to act reflectively to consider the best approach to a situation, analyze and evaluate his/her action and then make the most effective decision in order to carry out the next step. This real life (as opposed to simulated or classroom) situation and the high risk nature of adventure-based activities may well serve a strong developmental purpose by addressing many of the elements required to be a self-regulated learner. Such elements include: **intra-personal** aspects like self-esteem and self-motivation; **inter-personal** skills like trust, teamwork, relationships; **cognitive issues** regarding problem solving, decision making, planning or goal setting; and other **affective aspects** like values, attitudes, commitment, emotional development, managing fear and anxiety, etc. All these aspects enable learners to direct their thoughts, feelings and actions (being reflective) towards the attainment of their goals

(Schunk & Zimmerman, 1994:355). Reflective thinking is one of the demands of constructivist practice.

According to Zimmerman (1986) reflective thinking contributes to self-regulated learning. Further to this, self-regulated learning strategies have been found to be positively correlated with achievement (Zimmerman, 1986, as cited in Areglado *et al.*, 1996). One of the intended goals of adventure-based programmes is to develop in learners particular abilities such as positive self-esteem, self-discipline, managing anxiety, self-motivation, team-work or relationship building. This intended goal is achieved through purposeful and challenging activities, guided experience as well as the consequent reflective action by the learners in situations which require problem solving and decision making.

1.3 The role of more experienced practitioners in adventure-based education

It is crucial at this point to highlight a significant aspect of adventure-based learning. This aspect is the role of the instructor or leaders in the context of the activity (where and when it is happening). Because adventure activities are characterized by high risk and the consequent fear experienced by the participant, the instructor and the leaders play a very important mediating or scaffolding role in helping the participant through to the next level. This happens through supportive tools and signs like language (both technical and psychological), gestures or by physical means. Vygotsky considers the social environment critical for learning and thinks that the integration of social factors with personal factors produces learning (Schunk, 1996). A key concept in Vygotsky's theory is the zone of proximal development (ZPD) which is defined as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, cited in Schunk & Zimmerman, 1996:358). Working in the ZPD in adventure-based activities requires a good deal of guided participation. The purpose here is to move learners towards becoming more self-regulated learners. The field of self-regulated learning has been

strongly influenced by Vygotsky's theory. Self-regulation requires meta-cognitive mediators like planning, problem solving, evaluating, etc. (Schunk, 2000:359).

1.4 Aims of this research

This research aims to investigate the current national and international status as well as the features of adventure-based learning programmes and activities. To this end an analysis and interpretation of the various applications of adventure-based programmes and these programme successes in the learning context within a variety of national and international scenarios will be conducted. A definition and description of activities relevant to adventure-based programmes will be formulated.

Furthermore, this research will serve to drive an in-depth case study of the Lilyfontein School where such adventure-based activities form part of the school's weekly curriculum. An outcome of this study will be to investigate and produce empirical evidence that shows the extent to which participation in adventure-based activities is able to mediate learning in the development of a more holistic or self-regulated learner. As this evidence becomes available a parallel and ongoing action research approach will then serve as an evaluative dimension to assess the value of these findings. The intention of this action research approach is to provide relevant information to improve the design and practice of the curriculum offered at Lilyfontein School, but also to provide a strong case for curriculum development in other educational situations.

1.5 Goals of this research

1.5.1 The primary goal

The primary goal of this research is an investigation into the pilot programmes currently in operation at Lilyfontein School located near East London in the Eastern Cape Province. These programmes use adventure-based activities to achieve required outcomes as part of the Life Orientation curriculum. The goal of this research is to determine the

effectiveness of the programmes in the school curriculum. An action research type model will be applied over three time-cycles (see chapter 8, pp.159-161) with regular feedback from various participants to determine the value and areas of development required in the programme offerings.
Within this framework the following questions were asked:

1. How do adventure-based activities serve to address and enhance the requirements of the national Life Orientation curriculum from grade 4 to 9?
2. How best can the school use its assets to provide an adventure-based programme that will be of maximum benefit to its learners?

In order to accomplish this primary goal a secondary goal will need to be investigated through collecting evidence of current practice in specific domains.

1.5.2 The secondary goal

Although termed the secondary goal this is the major evidence gathering portion of this research. The evidence from these findings will serve to inform the formulation of the primary goal of this research.

The secondary goal is to determine the part played by adventure-based activities in helping learners to mediate their everyday learning. Research clearly shows that self-regulated learners are likely to be more effective in carrying out a variety of different tasks. By developing appropriate strategies of self-regulation, learners ought to become more effective learners as they use these strategies (Schunk, 1996). Schunk and Zimmerman (1996:389; 401) also claim that self-regulated learning is affected, amongst other aspects, by the learner's self-esteem, the ability to think reflectively (meta-cognition) and the ability to manage one's own anxieties and fears.

This research study uses Activity Theory to investigate, analyze and interpret activity systems in the socio-cultural settings in which learners engage in adventure-based

activities. Wertsch *et al.*, (1995:11) state that the goal of a socio-cultural approach is to explicate the relationships between human action, on the one hand, and the cultural, institutional, and historical situations in which this action occurs on the other hand. Activity Theory provides a means to understand the value and meaning learners attribute to such experiences by identifying and analyzing 'tensions and contradictions' that emerge in the human action which in turn is the agent for change (Engeström, 1993:71). This type of change or transformation process, according to Engeström (1987,1991, as cited in Cole & Engeström,1997:40) is essentially, what he calls, an expansive learning process (see chapter 5, pp. 92-95) where practitioners acquire a new way of working while designing and implementing the new practices themselves (Cole and Engeström, 1997:31). Activity Theory shows the changes that occur during the course of an activity system when such 'contradictions' (see chapter 5, pp. 87-89) are encountered by the participants engaged in the activity. This research claims that in order to make these changes learners need to have self-regulated abilities which are meta-cognitive in nature. Meta-cognitive strategies include a range of strategies like self-evaluation, self-reflection, self-monitoring, ability to re-plan and re-focus, self-confidence, self-efficacy, self-belief in one's ability to solve problems, ability to handle fear and emotions and good decision making. These meta-cognitive strategies should enable participants in an activity system to alter the system's current approach to the task at hand and in so doing allow change and development to happen.

Although the primary and secondary goals are both vital in this study and will serve to make far-reaching decisions, the main focus of this study will be to produce, gather and then analyze the evidence from this study in order to answer the questions below.

Questions asked within this framework are:

1. Do adventure-based activities serve to mediate learning by improving the meta-cognitive strategies that ensure that participants become better self-regulated learners?

2. Do the self-regulated or meta-cognitive strategies enhanced through experiencing adventure-based activities fulfill specific Learning Outcome expectations of the national Life Orientation curriculum?

1.6 Laying the foundation of this study

In order to deal meaningfully with the primary and secondary goals of this investigation, it is necessary to address matters which serve to lay the foundation on which the infrastructure of this study is based. The following chapter serves to trace the historical path of *outdoor education* to current trends in *adventure-based education* and in so doing highlight the *definition dilemma* and produce a current and universally acceptable definition of adventure-based education relevant to this research study.

1.7 The structure of this thesis

This thesis consists of sixteen chapters. At the beginning of each chapter a very brief synopsis will provide the reader with insight into the chapter's content. At the end of each chapter a brief summary will allow the reader opportunity to reflect on the relevant issues before proceeding to the next chapter.

There are two important characteristics of this research. Firstly, the primary goal is about finding the best possible curriculum application at Lilyfontein School and is monitored through an action research process. The secondary goal forms the major data-gathering portion of this research and provides the evidence to support the action research component through an empirical approach to the information gathering process.

Secondly, quotations from the participants appear unedited and reflect the true language used by the participants in the written narratives or during the participant observations.

Chapter 2

The context of this research

Chapter two gives the school context and background to the adventure programmes offered. It also offers a few foundational considerations that are necessary in order to give perspective to this study. These considerations encompass the historical perspectives of outdoor education, the dilemma surrounding a universal definition of adventure-based education, the lack of empirical research and, finally, a proposal for a working definition of adventure education on which this research will be based.

2.1 The school

This study investigates the adventure-based programmes offered at a school situated 21 kilometers to the north of East London, in the Eastern Cape Province in South Africa. The maps below show the geographical location of East London in figure 2(a) and Lilyfontein School in 2(b).

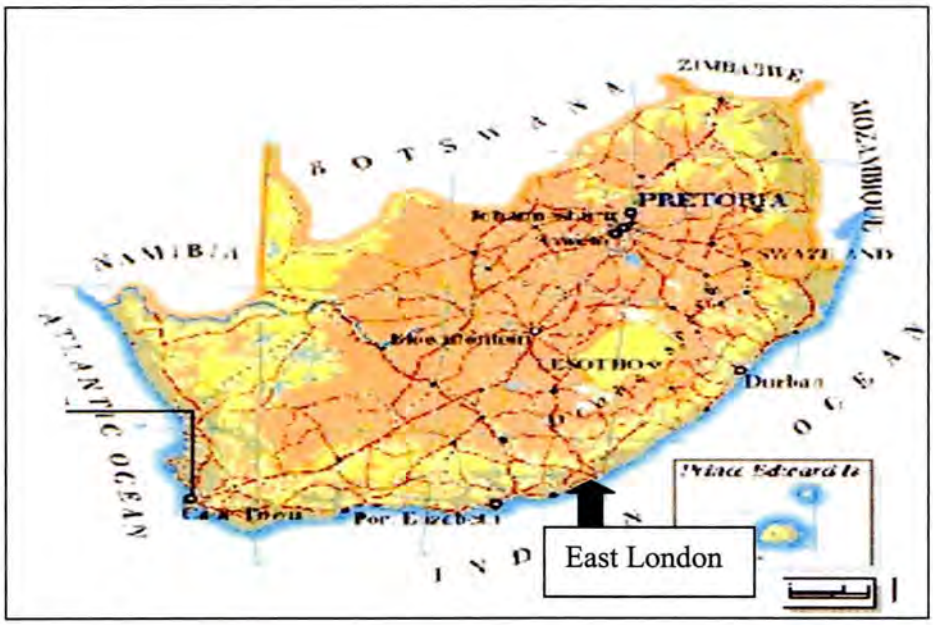


Figure 2(a). The geographical location of East London

Figure 2(b). The geographical location of Lilyfontein School

The school is a combined public school consisting of learners ranging from grade R (+-6 yrs) to grade 12 (+- 18 yrs), a total of 300+ learners. The Primary School was taken over by the then Cape Education Department in 1905 and has run as a fully-fledged Primary School (up to and including grade 7). In 2001 the school chose to extend its curriculum into grade 8, thus culminating in its first grade 12 learners in 2004.

The School Governing Body (SGB) purchased 40 hectares of land surrounding the Primary School, and the High School buildings were built through parent body funding. The large grounds offer tremendous potential for outdoor education in all its forms. The northern boundary has a flowing stream that offers many forms of ecological studies and the land also abounds with indigenous flora and fauna. It has a man-made dam as well as access to numerous other larger dams. The school property is surrounded by farmlands that also have potential to be incorporated into the school's programmes. Below are two views of Lilyfontein School.

Figure 2(c). Two views of Lilyfontein School

The School Governing Body (SGB) and the School Management Team (SMT) have recognized the potential of these assets and are very supportive of developing and converting these assets into learning opportunities for the learners of Lilyfontein School.

2.2 The programmes offered

During the course of 2002, 2003 and 2004 many new adventure type activities were introduced into the extra-mural curriculum of Lilyfontein School. Alternative sports types include canoeing, paddling, kayaking and mountain biking. Learners are also given the opportunity to abseil and rock climb. Once a year learners compete in a team challenge adventure race known as the "Eco-challenge", a grueling 55 km event involving distance running, swimming, canoeing, abseiling, high-wire crossing, kloofing, cross-country cycling, crossing a river on motorcar tyre tubes and orienteering. Learners form teams of four with at least one member of the opposite gender. [In 2004 this national inter-schools event hosted by Lilyfontein School saw 52 school teams and 20 corporate teams being both physically and mentally tested in this event.] The photograph below (figure 2(d)) is the Lilyfontein team that won the schools' championship event.

Figure 2(d). The Lilyfontein adventure team who won the South African Schools Championships

Observations of and interviews with learners involved in these events showed very favourable feedback from the participants as well as from the parents of the learners who had participated in these challenges. Many of the participants commented on their self-accomplishments and team efforts (see appendix, D(v), p.329). Learners spoke of valuable lessons they had learned, about pushing oneself to the limits, being focused and committed. As one 14 year old participant reflected, "I was happy that I finished the challenge even with a broken hand and not being the person that slowed the team down or was the weakest link" (Bernard). Another saw it this way, "I surprised myself as I don't always think I can do things on my own" (Thando).

It was positive responses like these that led the educators at Lilyfontein School who were involved in these activities to recognize the potential learning value in such experiences. A Curriculum Development Committee (CDC) was formed to generate ideas and to formulate an action plan to accommodate the thinking and to incorporate adventure-based experiences into the everyday curriculum. The idea then was to begin a pilot project by offering adventure-based activities in a more structured way through the Life Orientation Learning Area programmes. These planned learning programmes would be offered within the intra-curricular programmes of the school. The reasoning behind this was that the chosen activities would serve as a vehicle to allow the Life Orientation requirements

of some of the Specific Outcomes (Curriculum 2005) as well as particular Learning Outcomes (Revised National Curriculum Statement) to be addressed and achieved.

The pilot study began in January 2003 (see appendix, F pp.320-323) and was observed and evaluated internally by the curriculum development committee (CDC), members of staff, parents and educators as it progressed during the course of 2003. An action research approach was applied so that adjustments to the content and application of the programmes were made and recorded on a regular basis. Specific comment on the action research aspect of this study can be seen in chapter eight.

The programmes were offered from grade 4 up to and including grade 11. Each grade had a specific aspect like, abseiling, rock climbing or canoeing that they worked through during the course of the year. They were exposed to a knowledge and theory component as well as an experiential part in which each participant had to do climbing, abseiling, hiking, canoeing, etc. Grades 7, 8 and 9 learners were assessed as part of the required forms of assessment on both the practical as well as the theoretical aspects, both of which formed part of their Life Orientation Learning Area portfolio, as required by the National Education Department. The empirical results of the secondary goal ought to underpin the value of the primary goal in this study and consequently make a strong argument for a submission to the Department of Education. This submission may well add considerable value to the curriculum offerings in the new Life Orientation programme of the FET band.

The following, figure 2(e), were the instructional programmes conducted during 2003 and 2004:

Components for the adventure programmes

Grade 4:	General skills development programme, canoeing, cycling, dam swimming, obstacle course, climbing wall, hexagon apparatus and group dynamics.
Grade 5:	General skills development programme, reinforcement of grade 4.
Grade 6:	General skills development programme, including abseiling and group dynamics.
Grade 7:	Canoeing, group dynamics, initiative tasks and survival camp.
Grade 8:	Rock climbing group dynamics, initiative tasks and survival camp.
Grade 9:	Hiking (4 days), group dynamics, initiative tasks and survival camp.
Grade 10:	Equestrian component, group dynamics, initiative tasks and an equestrian camp.
Grade11:	Leadership component.

Figure 2(e). An outline of the Lilyfontein adventure programmes

The grade 11 learners were used as leaders to assist the learners in other grades with whatever skills were required in the activities. The relevance of this mediated learning and role played by peers and the instructor will be addressed theoretically under the Zone of Proximal Development (ZPD) in chapter five and practically in chapters ten, eleven and twelve (see pp. 172 –219)

The programmes were offered during the course of the week on Wednesdays and Fridays. On these days from 07:30 to 13:00 learners were taken to specific venues, e.g. to the cliffs to do rock climbing or abseiling or to the climbing apparatus on campus to practise their climbing skills. Alternatively they may have been taken on a hike or to do canoeing

during the course of this time. All activities were structured to meet the requirements of the curriculum in order to allow learning experiences to happen.

Another component to fulfilling the requirements for their grade was that the learners would have to attend a camp which ranged in duration from two days to a week depending on their grade and age group. The content of the programme ranged from survival type camps to activities relating directly to cognitive learning to reinforce academic aspects which are normally class-based. Preparations with regard to observations and collecting of data required by science, biology, geography, and even language subjects were integrated into the programmes.

2.3 Foundational considerations of adventure-based activities

Imperative to this study is the understanding of issues that will affect the interpretation of this research. The remainder of this chapter serves to trace the historical path of outdoor-education to current trends in adventure-based education and in so doing to highlight the *definition dilemma* of adventure-based education. The aim then will be to produce a working definition of adventure-based education that is current and has universally acceptable criteria. This working definition as well as the issues discussed here will be regarded as the foundational considerations of this study.

2.3.1 The problems relating to adventure-based education

2.3.1.1 The rapid growth of outdoor pursuits in education

During the late 1950s and early 1960s the western nations, United States, Canada, Great Britain, New Zealand and Australia, witnessed a tremendous educational movement towards a 'new' form of education, widely referred to as outdoor education. Donaldson and Donaldson in 1958 had already claimed that:

> Outdoor education has already been termed the major contribution of the twentieth century to education ... school camping has been called the apex of outdoor education programmes. (Donaldson & Donaldson, 1958:9, as cited in Hammerman, 1973)

By 1963, in the United States Hammerman (1973:45) comments that school camping, or resident outdoor education had made a significant impact upon public education across the nation, with a number of "outdoor school" programmes continuing to develop at a rapid rate.

Canada experienced a similar expansion in outdoor programmes. Nuttall (1969:3) writing in *Outdoor Education*: a survey of activity in Canada, notes that "...interest in outdoor education is burgeoning in many areas of Canada".

In Britain the outdoor pursuits and adventure education field studies have pioneered major advances in outdoor education. MacKenzie (1973:267), after an international study tour of outdoor education programmes in New Zealand, Australia, England, Wales, Scotland, Sweden, France, Russia and Finland in the 1970s, reports that Great Britain had seen a great expansion in outdoor education in the schools since 1950, through a variety of forms. These included field studies in geography, history, biology, and latterly some environmental studies involving a more integrated approach, but the most popular and extensive development has been in the growth in *Outdoor Pursuits* – for example: sailing, canoeing, rock climbing, hiking, camping, skiing and orienteering. More and more educational authorities are acquiring residential outdoor pursuit centers for their schools, often in the rugged physical environments of Northern Wales, the Lake District and parts of Scotland.

2.3.1.2 The lack of a suitable definition

This rapid growth of interest in outdoor education has resulted in a heterogeneous proliferation of alleged outdoor education programmes and related terms (Clayton, 1981:3). This trend spread into South Africa and the obvious lack of an appropriate definition of outdoor education may well explain the multitude of outdoor-centered activities that were found in South Africa in the early 1970s.

Outdoor education's disconcerting feature is its diversity and it consequently has many activities shading under its branches. Many teachers throughout the world have been involved in its popular cause but as Clayton (1981:11) says, few have tarried to probe its nature. More and more activities have been labeled "outdoor education" simply because they are conducted beyond the confines of the class room. Clayton sees the problem as follows:

> One of the biggest problems confronting outdoor education is its need for identity and adequate definition. There are many who speak eloquently and enthusiastically about outdoor education , but few who, when confronted can tell you what outdoor education really is. (Clayton, 1981:26)

This problem of a lack of a comprehensive definition appears to be widespread and universal. Clayton reports that by 1962 the position had become so confused that a study conducted by Cockrell reported widespread misunderstanding regarding the meaning and content of outdoor education as well as a total lack of standard terminology relating to outdoor education.

It would seem that in view of this rapid growth of outdoor education both abroad and in South Africa educators are not able to adequately record past developments.

2.3.1.3 The lack of adequate research

Even more surprising, according to Clayton (1981:28), is the fact that this phenomenal growth took place without purposeful and comprehensive prior research, so that the entire superstructure of outdoor education was launched with almost no foundation in the form of a philosophically and empirically sound rationale.

Furthermore very little attention was paid to scientifically investigating (remember this was the positivist era) the direction that future development should take in the field of outdoor education. Donaldson (1973) observed that outdoor educators' documentation at that time had been poor, the research skimpy and most often shallow. Its proponents have been doers rather that writers. Clayton (1981:5), however, recognizes the importance of

justifying the existence of outdoor education. Outdoor education must have a *raison d'etre*. Hammerman (1973:46) claims that the only rationale upon which justification for outdoor education can be maintained is the fact that it helps to fulfil that which *indoor instruction* cannot address in the aims of education.

Clayton's investigations in 1981 support his claim that very little research had gone into the benefits of outdoor education, but endorse the importance of research into outdoor education being ongoing and current. In the 1970s Hammerman (1973) also endorses the notion that research needs to point the way for curriculum content, instructional techniques and administrative procedure. This means that change, and the future development and growth of outdoor education will depend upon the willingness and the ability of professors, administrators, teachers and resource people in the field to support or refute, through research, the many positive goals they feel are being reached through learning experiences in the outdoor environment (Hammerman, 1973:368).

Neill (1994) in his honours thesis in psychology points out that some research dimensions were high priority and other dimensions were considered to be low priority. Neill (1994) claims that self-concept dimensions identified as priority in Outward Bound Schools were related to: physical abilities, physical appearance, honesty, trustworthiness, emotional stability, social support and problem solving. Neill (1994:11) quotes researchers like Ewert (1987) and Cason & Gillis (1994) in saying that:

> Outward Bound's eclectic basis presents a significant challenge to the serious researcher. The majority of Outward Bound and outdoor education has used the "black box" approach, focusing on program outcomes and ignoring their relationship to process issues and that research on Outward Bound high school programmes has been inconclusive. (Neill, 1994:11)

Guthrie (2002:132) writes in an article titled The Profession of Adventure Education Leadership: "Concern for the lack of research has been expressed frequently in the literature. Recently (early 2002), the topic was hotly discussed on the AEE list-serve. Some discussion on the list-serve suggested that a lack of research is due to too few PhDs, or too little time by professionals in this field."

2.3.1.4 The importance of historical factors

According to Clayton (1981) in his investigation of historic origins of outdoor education, it seems that the term outdoor education appeared sometime during the years between 1940 and 1950 and was largely related to resident outdoor schools and probably originated from ventures in camping education in England (Hammerman, 1973).

An understanding of the historical events relating to outdoor education ought to provide a platform to help create a current working definition of what was originally referred to as outdoor education or its associated terms. Historical aspects also have an important bearing in terms of the Vygotskian socio-historical context to Activity Theory used in this research (see chapter 5, p. 62).

The aim of this chapter is not to provide an in-depth study of each aspect of outdoor education or its related fields but to extract elements of these fields that will best serve to formulate a current working definition of adventure education. This research also intends to set limits so that the focus of the investigation will be around adventure-based education and how it is currently defined. This will also serve to highlight how the educational emphasis of outdoor pursuits has changed over the last twenty years to become more focused on adventure-based education yet with very little empirical evidence to substantiate the claims of its educational benefits.

2.4 Activities related to adventure-based education

In order to move towards a definition of adventure-based education, a background understanding of related pursuits is a prerequisite to clarifying the characteristics of adventure type activities. This approach has been taken to avoid opting too easily for an overarching term like "outdoor education".

2.4.1 Outdoor pursuits

The term "outdoor pursuits" appears to be of British origin and is used to refer to physical and recreational activities associated with adventure education, such as hiking, mountaineering, camping, skiing, canoeing, swimming, sailing, back-packing, snow-shoeing, horse riding and archery (Drasco,1973, cited in Clayton, 1981: 18). However, according to Clayton, "Outdoor pursuits" have been broadened to include virtually any activity which takes place outdoors, even field studies.

Sports such as rugby, cricket, tennis and soccer did not qualify as outdoor pursuits as they were not regarded as recreational (Clayton 1981, 21). It has been noted by the researcher that Treverton College in kwaZulu-Natal adopts the use of 'outdoor pursuits' for their adventure programmes (see page 37).

2.4.2 Adventure- based counseling

Adventure-based counseling is an off shoot of Outward Bound schools established by Dr Kurt Hahn in the 1940s. In 1971 Project Adventure emerged through the efforts of educationalists and adapted Outward Bound strategies into Adventure programmes (Schoel, 1988). Out of these beginnings emerged Adventure Based Counseling (ABC), an outpatient therapy group at the Addison Gilbert Hospital, Gloucester, Massechusetts which began in 1974 (Schoel, 1988:32).

According to Radcliffe (cited in Schoel, 1988:33) by as early as 1982 adventure-based counseling had been used in residential treatment centers, substance abuse clinics, state and county youth service rehabilitation programmes, school special needs departments and psychiatric hospitals through the efforts of Project Adventure.

The main goal of Adventure-Based Counseling was the improvement of self-concept through the use of perceived risks and impossible tasks that are physically demanding to the participant (Schoel, 1988). The underlying belief is that perceived success in a task

will contribute to a feeling of achievement and this in turn may well influence self-esteem positively.

2.4.3 Environmental Education

Clayton (1981) highlights the uncertainty surrounding the meaning and nature of "environmental education", and the variety of definitions in existence by referring to a lengthy definition in the United States Environmental Education Act of 1970:

> An integrated process which deals with man's interrelationship with his natural and man made surroundings, including the relation of population growth, pollution, resource allocation and depletion, conservation, technology, and urban and rural planning to the total human environment. Environmental Education is a study of the factors influencing ecosystems, mental and physical health, living and working conditions , decaying cities, and population pressures. Environmental education is intended to promote among citizens the awareness and understanding of the environment, our relationship to it, and the concern and responsible action necessary to assure our survival and improved quality of life. (Clayton, 1981:42)

This characteristic adding to the definition in order to clarify its meaning is indicative of the vastness of environmental education.

The interpretation of environmental education in the South African context as contained in a working document for the Environmental Education National policy (1994) reads as follows:

> An on-going process, leading to the development of a population that is aware of, and concerned about the total human environment and its problems, and which has the knowledge, attitudes, motivations, commitments and skills to work both individually and together towards the solution of current problems and the prevention of new ones. (DoE, National EE policy, 1994:8)

The white paper on Education and training of 1995 explained the need for environmental education as a vital element for all levels and programmes of the education training system in order to... " create environmentally literate and active citizens and ensure that all South Africans present and future enjoy a decent quality of life through the sustainable use of resources".(DoE, 1995:3)

In South Africa the Revised grade R-9 (2002a) and new National Curriculum Statement for grade 10-12 (2002b) has attempted to include aspects of environmental education in all the Learning Areas allowing each learning area to address environmental education according to its requirements. The nature of presentation is intentionally one of integrating EE into most Learning Areas in the new curriculum.

2.4.4 Conservation Education

Conservation education is principally concerned with the biophysical environment which is made up of all external conditions and influences affecting the life and development of an organism. The biophysical environment is therefore comprised of both biotic (living) and abiotic (non-living) elements. Conservation education is dedicated to the protection of this biophysical world, or the wise use of natural resources (Richards,1976).

2.4.5 Environmental studies

Environmental studies appears to be of British origin and according to Clayton (1981:33) environmental studies views the environment as a tool for promoting mainly academic objectives and therefore differs from environmental education in that it has no ethical or moral overtones such as concern for the environment or affective objectives in which correct environmental attitudes or values are promoted.

Confusion between environmental studies and environmental education has often arisen and can be indicated by a definition of environmental studies in the United Kingdom in the late seventies, highlighted by Clayton (1981:34):

> The environment is used as a source of stimulation for realistic activities in language, mathematics, science, the humanities and with the development of skills and abilities as an important purpose. This is known as environmental studies. (Department of Education and Science, UK, 1977)

Clayton (1981:36) highlights the difference between environmental studies and outdoor education in that although both are methods, environmental studies, unlike outdoor

education, is concerned with the whole environment (indoor, outdoor, urban and natural) and its primary function is, again unlike outdoor education, the pursuit of academic goals.

2.4.6 Adventure Education

Adventure education as it is currently practised appears to be that form of education pioneered by Hahn through Outward Bound Adventure Schools in which outdoor pursuits are used within a context of genuine but controlled danger (Clayton, 1981:29).

Other related terms associated with adventure education are "adventure training", "survival training" or "stress training" used in leadership training. The British Journal of Physical Education (June, 1979) describes adventure education as a process whereby one learns about oneself through the heightened ability to perceive things while under stress, the inner exploration of the individual by himself though the use of physical activity as a type of self-exploration (Cullingford, 1979: as cited in Clayton, 1981:34).

2.4.7 Outdoor education in South Africa

Residential School Camping and Outdoor School – both British and USA origin, have many similar rationales and will not be discussed further here. Attention will rather be given to historical aspects of outdoor education in South Africa.

Because outdoor education was regarded as a method rather than a specific subject, it became more of a slave to serve other subjects. It was used as a vehicle for many other subjects and this resulted in the aims of outdoor education being rather general. This may well explain why there have been so many forms of and approaches to outdoor education throughout the world, with South Africa being no different to the rest of the world.

In the old South African Education system (prior to 1994) each of the provincial education departments had policies with regards to outdoor education which were based

on National policy. The outdoor education programmes were broadly divided into two main types:

(i) Outdoor programmes run at outdoor schools or centres (residential school camps) and

(ii) Outdoor programmes conducted by the "normal" school itself in the form of field work, outdoor pursuits and short outings.

In the South African context the "Veld School" or the "Youth Preparedness Programmes" with their strong ideological bias was characteristic of the old Transvaal Education Department. The Auxiliary Services assisted schools with their organization of educational trips.

In Natal the application of outdoor education was very different in that the Natal Department of Education's policy was decentralized and no departmentally staffed outdoor education schools existed. Schools organized their own experiences through approved outdoor organizations (NGOs). Their approach to outdoor education was primarily conservation centered.

The notion of adventure education was found in the form of the Estcourt Veld and Vlei school housed in the Greystone Centre originally controlled by the Natal Parks Board. The Veld and Vlei Adventure Trust was the South African equivalent of the Outward Bound Adventure Schools created by Hahn. The movement was started in South Africa by Spencer Chapman in June 1958 with the first Veld and Vlei Adventure School in Sedgefield in the Western Cape. A second school was opened at Elgin in 1965 and the third at Estcourt in 1967 (Clayton, 1981:87).

Clayton's observation (1981:160) is that the adventure element at the Estcourt centre was very restricted in that it was very syllabus bound to accommodate the requirements of the Education Department. The Cape Education Department according to Clayton (1981:216) was not as advanced as the other provinces and his observations highlight the widespread ignorance regarding the meaning, philosophy and methodology of outdoor education.

Furthermore, Clayton found that the majority of outings were academically orientated and relied heavily on worksheets, demonstrating that the methodology of the classroom had merely been translocated to another environment.

2.5 The definition dilemma

Clayton (1981) claims that the "definition dilemma" occurring both in Britain and American education systems is unfortunately widespread in South Africa. Forms of outdoor education in South Africa include: adventure education, camping education, conservation education, environmental education, field education, leadership education, environmental teaching and youth preparedness programmes. It must be clearly understood that these programmes seldom exist in isolation from one another, and that overlap frequently occurs.

2.5.1 Towards a suitable definition of adventure-based education

In the old South African Education system outdoor education was generally a mix of environmental education and outdoor type schooling, involving walking in the veld finding specimens and working from a worksheet. It involved doing mathematics, biology, science, creative writing and poetry in the outdoors. In some instances learners were exposed to tougher programmes like hiking or an obstacle or ropes course. In more recent years, following the Outward Bound trend, some programmes have included riskier activities like abseiling, rock climbing, canoeing, high ropes courses, survival camps, etc.

This shift in the concept of outdoor education to adventure-based education appears to be more than just a semantic change. An investigation by Attarian (2002) into a trend analysis conducted by Ewert in 1987 supports Ewert's prediction that adventure programmes would show a significant increase by the year 2000. Attarian also indicates a change in the new activities added to the programmes. The most common new trends include ropes and challenge courses, climbing walls, backpacking, mountain biking and

caving (Coutellier, 2001). The adventure travel industry in the United States has also shown growth that supports the trend towards adventure based activities. This trend is also being followed in South Africa where a growing number of privately organized adventure programmes have sprung up, many of which also use artificial environments to conduct adventure activities. Artificial climbing walls and challenge courses have, according to Attarian (2002), become more popular in many countries. In South Africa the extreme type sports, i.e. white-water rafting and para-gliding to only name a couple, appear to be becoming more popular as leisure activities.

The shift then is towards an adventure programme with a different emphasis. The emphasis is on activities that challenge the self through risk inducing activities (abseiling, rock climbing, etc.), rather than through more cognitive or academic challenges.

2.5.2 The nature of adventure-based education

As described above, adventure education has its roots in Dr Kurt Hahn and Laurence Holt's brainchild known as the Outward Bound movement. The idea has spread through eighteen countries and five continents. Its intended philosophy is to develop self-confidence and self-awareness through self-discovery (HRH Prince Philip, quoted by Zelinski, 1991:13).

A key element of adventure education is learning through exposure to real or perceived danger. According to Zink (2001) the UK Mountain Training Board state in their National guidelines :

> Challenge and adventure are never free of risk. Learning to have regard for the safety of oneself and others is an aspect of the personal development of participants to which good instruction and leadership will make an important contribution. (UKMTB, 1995:7)

The concept of risk and the part it plays in adventure education will be considered in chapter three.

2.5.3 Some educators' perspectives regarding the benefits of adventure-based education

Educators, whether or not directly involved in adventure activities, were asked to make a brief comment on what they think the benefits of adventure-based education are for learners at Lilyfontein School. Among their observations were:

- Just the outing seems to motivate them.
- The seriousness of the activities, heights, suspended from the end of a rope or high- wire makes it very real and they do realize that they should not be messing about.
- Perhaps it helps them to focus on what they are doing ... it seems like it ...can't really say though.
- Whether it helps or not in class...I don't know, but if I had to guess I think some transfer would happen into the classroom situation.
- Listening to instructions seems to be taken more seriously...if anything that would be a great skill to pick up...kids do not listen in class.
- It's not my cup to tea but I suppose some good comes out of it.
- I don't know really...perhaps they develop a positive attitude towards school, I think that would have great value.
- I have noticed that (Z) writes a lot more freely when he writes about adventure, e.g. The Orange River excursion. He wrote more than a page and his passion was evident.
- Some kids have good ball skills that give them confidence and self-belief. Adventure activities give other kids something else to try and excel in.
- Yes I think there is a lot of incidental learning in listening to instructions, learning about consequences. Consequences are always greater or more immediate in real contexts, either you get injured, very cold or get lost maybe. It does toughen the kids up and they need it.

2.5.4 A working definition of adventure-based education.

Considering the perceptions, ideas, notions, and propositions highlighted in this chapter and for the purpose of this study, a working definition that would best be accepted for the adventure-based education programmes offered at Lilyfontein School is as follows:

Those activities that are used within the context of authentic but controlled risk experiences with the express purpose of developing meta-cognitive strategies like problem solving skills, decision making, self-motivation, self-reflective abilities, self-evaluation, management of anxieties and fears and the development of a positive self-esteem so that these participants may become better self-regulated learners.

2.6 Reflection on this chapter

Lilyfontein School uses adventure-based activities as part of its Life Orientation programme. History shows that a wide range of outdoor programmes have been used over the years in education. The shift towards adventure-based education has resulted in the lack of a common understanding and definition of this new and expanded form of outdoor education. Clearly there is a serious lack of research. Research has been scanty, with some research pointing to the value of rigorous experiences in developing self-esteem and team-work, but there is very little empirical evidence investigating the value of adventure-based activities on the cognitive or meta-cognitive development of the participant.

This chapter gives the context of adventure-based education and culminates in a working definition. This definition of adventure-based learning will be used as the perceptual framework of this research. The definition points out that adventure-based activities are those activities that are used within the context of authentic but controlled risk experiences with the express purpose of developing meta-cognitive strategies which mediate better self-regulation in learners.

Chapter 3

A literature review of trends in adventure-based education.

This chapter serves as an overview of current trends in adventure-based education. Trend analysis according to Attarian (2002:142) is an important source of information for adventure programme professionals, as trends can provide information for decision making, encourage the development of new programmes, train staff, instigate new policies or procedures and update resources.

In this chapter, the terms 'adventure programme', 'adventure recreation', 'adventure-based activities' and 'adventure education' will be used interchangeably but with a clear understanding of the working definition of adventure-based education as used in this research and stated on page 30.

Although adventure-based activities feature often in the media and there is a range of approaches to this relatively new slant to outdoor education, very little in-depth research has been uncovered by the researcher during the course of this study. The main forms of research in this field have been in the psychology domain, more specifically related to the development of adolescent self-concept, self-esteem, and the affects of risk and /or anxiety as related to adolescents. The researcher is fully aware of the lack of sound empirical literature relating to meta-cognitive learning in adventure-based experiences and is therefore highly reliant on the use of activity theory to create a theoretical framework for this study. The limited examples of the literature used in this chapter will highlight this problem and also show that any references to meta-cognitive strategies is purely by chance and are of little value to this study.

3.1 Growth of adventure-based programmes

Adventure-based programmes have a long and varied history whose origins can be traced back to organized camping, and environmental and experiential education movements:

> The number of adventure programs showed steady growth from the 1970s through the 1980s and into the 1990s, following the establishment of the Association for Experiential Education (AEE) in 1975. Today, the AEE has established a membership of over 670 organizations (AEE, 2000). The

> majority of this growth can be attributed to the emergence of experience-based training and development programs (Riola & O'Keefe, 1999). Wilderness programs for youth at risk are also on the rise (Davis-Berman & Berman, 1994). Currently, school and college programs make up approximately one third of the membership, surpassed only by experienced -based training and development programs that account for 41% of the interest groups (AEE, 2000).
> (Attarian, 2002:143)

Attarian (2002) shows the growth in adventure activities by highlighting the American Camping Association (ACA) survey that 75% of camp directors reported adding new activities and programmes over the last few years. The most common programme trends include rope and challenge courses, climbing walls, backpacking, mountain biking and caving.

According to the National Sporting Goods Association (NSGA) in America, participation in adventure activities led sport growth over the last five years of the 1990s (2001). Attarian (2002) quotes Ewert (1987) as saying that adventure sport in America has increased to such an extent that participation in adventure activities is placing greater demands on the natural settings that support adventure-based activities.

According to Attarian (2002:146), two of the most popular artificial adventure environments in America are indoor climbing walls and challenge courses. Recent estimates by the NSGA (2001) suggest that in 1998 over 2.7 million people climbed a climbing wall, which indicates the popularity of such an activity. Challenge courses would include activities like high ropes courses, initiative tasks, group initiatives, etc. Over recent years changes in design and construction have reflected a far more professional approach to the presentation of adventure programmes.

3.2 Certification and accreditation

Certification of adventure instructors was a serious topic of debate and discussion in the 1970s but Attarian (2002) says that according to Gass (1999), certification never materialized due to the inability to adequately identify and evaluate the soft or 'people skills' associated with adventure programming. However, the idea of accreditation has had more success in the professional assessment of programmes due to accreditation giving adventure programmes the ability to reach standards without sacrificing design

features as well as encouraging internal and external reviews in order to enhance the programme quality (Attarian, 2002:148). Generally the movement internationally is for accreditation and certification to be a prerequisite for instructors and institutions, as this would ensure a measure of evaluation and accountability.

This concept of evaluation is widely supported, "effective evaluation provides the means to learn from successes and failures. It [evaluation] will be a critical element in determining the broader acceptance and development of the field" (Warner, 1999:299). In conclusion, Attarian (2002:149) says that outdoor adventure education in its many forms is here to stay. Attarian makes the point that as interest in adventure education continues to grow, adventure programme professionals will continue to be faced with the challenges of how to better serve participants, train competent leaders, design and evaluate programmes, manage risk more effectively and create a positive public image.

In South Africa an attempt has been made to legislate the adventure industry through the Adventure Recreation Association (ARA). Only in recent years has accreditation become a priority, and this is reflected in ARA's mission statement, which aims to accredit outdoor adventure recreation centres as well as to ensure the accreditation of adventure programmes offered in South Africa (ARA constitution, 2004).

3.3. Extracts from current research into adventure-based activities

3.3.1 Research into Outward Bound Programmes – Australian National University, 1994.

Research done by J.T. Neill for an honours thesis in psychology at the Australian National University in Canberra in 1994 explores the effect of Outward Bound High School programmes on adolescents' self concept, mental health and coping strategies, and mentions that:

> ...Outward Bound Australia school programs involve "total and integrated programming incorporating physical and adventure based activities, personal development techniques and academic studies in the field" (Richards, 1977, p.123). Although Outward Bound programs do not derive from any specific psychological theory, the basic underlying tenet is that "all forms of growth in the human being, whether they be physical, psychological, social or cognitive can be significantly enhanced by the

individual engaging himself in active experiences in these various fields" (Richards, 1977, p.37). The impact is further enhanced by the "great interdependence of these variables evidenced in Outward Bound" (Richards, 1977, p.37). Outward Bound instructors use a 'guided discovery learning' approach (Outward Bound Australia, 1994b, 1994c). This means providing enough direction and structure to guide the students' development and to ensure a high chance of 'learning success', but not so much as to remove the opportunity for students to discover for themselves (Outward Bound Australia, 1994a). The emphasis is on learning through personal and group discovery, as opposed to didacticism.

Aims and objectives
The stated objectives for Outward Bound Australia school programs are to provide a learning environment which:
(a) improves confidence, increases self-esteem and develops maturity,
(b) develops teamwork, co-operation, effective communication and understanding,
(c) stimulates interpersonal skills and leadership development,
(d) focuses resourcefulness, initiative, self-reliance and capacity to adapt to change,
(e) encourages continuing personal development and goal setting,
(f) challenges the individual to cope with change, overcome difficulties and build on their strengths,
(g) creates real life experiences which complement and reinforce the learning from within the classroom, and
(h) develops a rapport between staff and students not readily attainable in a school environment (Outward Bound Australia, 1994c).

Neill (1994) clarified the aims of Outward Bound high school programs from the perspectives of Outward Bound instructors and accompanying high school teachers. Fourteen instructors and thirteen teachers were surveyed with regard to their overall objectives as well as the particular self-concept dimensions and coping strategies which they aimed to influence during Outward Bound high school programs. The picture emerged that some dimensions were high priority whereas other dimensions where considered low priority. The self-concept dimensions which instructors and teachers identified Outward Bound high school programs as aiming to enhance were: Physical Abilities, Physical Appearance, Single-Sex Relations, Honesty-Trustworthiness, Emotional Stability, and General Self (Marsh, 1990). The coping strategies which instructors and teachers aimed to encourage on Outward Bound high school programs were: Social Support, Focus on Solving the Problem, Work hard and Achieve, Focusing on the Positive, Physical Recreation, and Social Action (Frydenberg & Lewis, 1993a). The coping strategies which instructors and teachers aimed to discourage were: Worrying, Seeking to Belong, Wishful thinking, Not Coping, Tension Reduction, Ignoring the Problem, Self-Blame, and Keeping to Self (Frydenberg & Lewis, 1993a). [Neill, J. (25 March 2004). file://A:\ The effect of Outward Bound high school programmes on adolescents.htm].

Chapter two of my study highlights the lack of empirical research in the field of adventure-based education and the tendency to make broad subjective assumptions about the effects of adventure type experiences on people (seen in aims and objectives a-h, above) even though little concrete evidence appears to be available. The point is made in this chapter that there has been a paradigm shift in terms of adventure-based activities towards a value being placed on risk activities. The next section of this chapter gives an indication of the relevance of risk inducing activities in adventure education but also has very scant concrete evidence that reveals the use of meta-cognitive strategies.

3.3.2 New Zealand case study on risk management in adventure programmes

In an article titled "Risking a Debate-Redefining Risk and Risk Management", Zink and Leberman (2001) write on various aspects of risk:

3.3.2.1 The value of risk in Adventure programmes

According to Zink & Leberman (2001:50):

> The majority of the research on risk has been generated in the areas of finance, business and health, and focused on utility theories and decision-making under uncertainty (Brown, 1996; Trimpop, 1994). Inherent in this research is the assumption that people make rational decisions about utility, given the information they have and the probability of outcome (Bernstein, 1996). In general, risk assessment has "centered on quantification in terms of probability" (Jackson & Carter, 1992, p. 41).
>
> The emphasis on quantification of risk has found its way into adventure education. This is evidenced by the appearance of equations such as, "Risk = Probabilities x Magnitude + Public Outrage" (Brown, 1998) and the development of a range of databases in adventure education organizations tracking incidents and accidents (Brown, 1996).
>
> The idea that risk is quantifiable in adventure education is reinforced by categorizing risk into real risk and perceived risk. Not only is "real" risk the risk which "actually" exists, it is also a "convenient way of expressing the fact that some people share a particular, normative view of risk which implies or seeks to suggest that risk can be disentangled from human biases" (Waring & Glendon, 1998). A normative view of risk is endorsed through adventure education where risk is segmented into risks in the natural environment and those related to equipment, constituting "natural risks," which further disentangles risk from human biases.
>
> Embedded in the concept of real risk is the notion that everyone interprets real risks in a similar way. There is a body of research which suggests that different groups in society perceive risks differently. Gustafon (1998), for example, found that women and men not only express different levels of concern about the same risks, but that "women and men perceive different risk...and gender difference may also be found...in the meanings attributed to the same risks," Brown (1996) refers to research which suggests "that white males on average perceive risk to be much smaller and much more acceptable than other people."
>
> The existing literature pertaining to risk in outdoor recreation and adventure education is uniform in defining risk. "Risk is the potential to lose something of value. This loss may lead to harm that is physical...mental...social...or financial" (Priest & Gass, 1997). Writers in other fields have suggested broader definitions of risk. Trimpop (1994), for example, defines risk as conscious or non-conscious "behavior with a perceived uncertainty about its outcome, and/or about its possible benefits or costs for the physical, economic or psycho-social well-being of oneself or others."

3.3.2.2 The purpose of risk

Zink and Leberman (2001:51) have this to say about the purpose of risk:

> Some writers have questioned the positive effect risk has on learning. For example, Beedie (1994) asked if it is "the successful outcome of taking a risk which is important or is it enough to undergo the process of risk taking." Estrellas (1996) also questions whether risk taking enhances or jeopardizes physical and emotional safety. Contrary to Priest & Gass (1997), she states that rather than promoting the growth of an individual and the development of a team, the manipulation of risk can be

dysfunctional when the risk is too great, as this can cause high levels of stress, which in turn, may impact negatively on individuals and groups.

3.3 2.3 Managing risk

When it comes to the managing of risk, Zink & Leberman (2001:52) point out:

Managing risk or ensuring controlled or safe situations without loosing the element of risk remains a quandary. Within the New Zealand context of adventure education, risk management is commonly associated with the Risk Analysis and Management System (RAMS).

Nichols (1999:105) describes a study by RAMS, a qualitative approach was used to investigate a group of outdoor instructors' perceptions of risk and risk management. The research sought to describe the instructors' subjective experience. Twelve instructors participated in the research. Each instructor was interviewed individually. The interviews were in-depth and semi-structured, allowing the instructors to talk about the aspects of risk and risk management that were relevant to them, yet ensured that all of the interviews traversed similar terrain.

The interviews ranged in length from forty minutes to one hour and twenty minutes. This study was only concerned with the definitions of risk and risk management and the role of risk and risk management in adventure education. The instructors in this study were well educated, with seven of the twelve having completed an undergraduate degree. For five of the instructors, their degree contained some components related to outdoor recreation or adventure education.

The findings of this study were such that there was a great deal of commonality in how the instructors defined risk both in their own lives and in their work. For the majority, risk was the potential to lose something of value, which is congruent with the adventure education literature (Brown, 1998; Ewert 1989). Two of the instructors defined risk in adventure education as an opportunity for adventure and self-discovery. The three instructors who had no formal training in adventure education tended to use different language when they spoke about risk. For example, one talked about risk in terms of thinking "about what could come up, the possible issues during the trip."

The uniformity with which the instructors defined risk may also be indicative of how pervasive the current risk discourse is in adventure education.

All of the instructors said risk had a positive, if not essential role in their lives. One stated, "I need to take risks to stay motivated and fresh, refreshed, sharp, to gain some of my potential." Another commented, "Risk is healthy. It makes you look at yourself. It allows you to totally focus on the now." A third instructor put it most succinctly when he said, "the risk is fun."

All of the instructors identified risk as a defining element of adventure education. Several examples highlight this notion. One instructor said, "It [risk] is empowering. They [the students] make a conscious decision... It makes them more aware of themselves, pushes their comfort zones, extends their boundaries." Another recounted a situation which one of her groups perceived as risky and the impact this had on them: "It wakes them up and energizes them. It makes them look outside of the bubble... They are 'chuffed' [very pleased] with themselves and with each other." A third instructor highlighted that risk provided "a sense of realness. The kids see the consequences... [and they] are immediate. It helps them focus on their role in the group and what they can do to change outcomes. And that they do make a difference." (Nichols, 1999)

3.4 Schools in South Africa offering adventure-based programmes

Currently there are a number of schools in South Africa that use outdoor or adventure-based pursuits to enhance their curriculum offerings. The researcher has recently visited a few of these institutions with the purpose of examining the learning experiences they offer to their learners. When considering the lack of literature on adventure-based education the researcher feels that information on what these institutions do daily will serve to provide a richer understanding of adventure-based education.

3.4.1 Treverton Preparatory and College

Treverton is an Independent school which was established in 1964. It is situated in the picturesque KwaZulu-Natal on the outskirts of Mooi River. The school has an environmental education bias but also has a very strong "Outdoor Pursuits" programme. This programme has an Award Scheme which offers opportunities for learners to develop responsibility and leadership. Learners work voluntarily towards achieving twelve awards: Drakensberg Award (climbing and hiking), Summit Award, Traverse Award, Rock Climbing Award, Solitaire Award, Road Running Award, Kayaking Award and others. All these awards involve adventure-based activities as described in this study's definition of adventure-based activities. Learners may achieve these awards anytime up to grade 12. Treverton's outdoor programme takes place outside of the everyday curriculum and forms part of the extra-curricular programme.

Treverton also offers a post matric course for one year and is open to any young man or woman who has passed grade 12. It is one of the most progressive, exciting and relevant post matric courses in the country. This course offers a range of 30 adventure experiences over the year, including the International Computer Drivers License (ICDL) computer course, toastmasters, financial literacy course, building and mechanical welding course. These learners are required to register for one tertiary course with a recognized service provider.

The researcher was fortunate to have in-depth discussions with the Chief Executive Officer, the Headmaster of the College as well as with the Principal of the Preparatory School on the benefits of their adventure-based programmes. The researcher was also able to interview some staff members, as well as a few College and post matric learners. All these people spoke very highly of the positive benefits such an adventure programme has for the learners. In response to the question of what the learners regard as the most beneficial to themselves, they all mentioned three common aspects. According to their subjective observations such adventure experiences build self-confidence, improve self-motivation and increases level of responsibility. (How these factors were actually measured objectively was not discussed.)

3.4.2 Stanford Lake College

Stanford Lake College was established seven years ago and functions as a fully Independent school offering grade 8 to 12. It is situated in the Magoebaskloof area approximately 35 kilometers from Tzaneen in the Limpopo Province.

Stanford Lake also has a very strong adventure programme which is incorporated into the everyday curriculum. Some of the aspects can be done as part of the extra-curricular programme. Stanford Lake has a fully operative Adventure Department which forms part of the infrastructure of the school. They also conduct adventure programmes for outside schools that come to the centre for week-long courses.

Their Adventure Department is manned by four qualified instructors; some courses run here are accredited through NGO accrediting bodies (THETA) under the auspices of ARA. Stanford Lake also has a very active post matric course exposing their candidates to a range of adventure-based activities in which the post matric students may become qualified to assist other learners on their adventure days. Stanford Lake has a very strong leaning towards technology as applied in an adventure-based context.

Instructors' observations of learner benefits at Stanford Lake highlight the notions of building self-confidence, improving self-planning, organization and coping under stressful situations.

3.4.3 Warrior's Programme

This is a recently established, challenging programme, also situated in the Magoebaskloof area. The programme comprises of four major components: Self-actualisation; Social Skills Development; Adventure, Eco-tourism, Health and Fitness; Entrepreneurship and Business Management.

The Warrior's programme is ideally suited to school leavers and as a foundation for adult life; it is marketed as a gap year after school. The setting is idyllic, situated deep in the indigenous forest with plenty of infrastructural equipment but unfortunately the researcher was unable to get a true idea of the actual programme offerings. Due to time constraints the researcher was also unable to talk with the students for any length of time.

3.4.4 Woodridge College

Woodridge College is situated 60 km from Port Elizabeth on the Cape Town route. It consists of a Primary School as well as a High School and also offers outdoor and adventure-based experiences for its learners.

3.5 Learners at Lilyfontein School

This research focuses on learners at Lilyfontein school. The learners were asked to write narratives about their experiences of adventure activities. More detail will be found in chapter ten. Of the 54 learners, 41 commented in some form or another on the fear or risk element of their adventure-based experiences.

Examples of comments from these learners are:

"It helped me to take control of intense situations." And ...

"I never wanted to climb that day and I told Mr K, sorry sir...forget it! But now that I did it has changed me and given me a lot more encouragement, it's amazing."

Many of these comments concur with the above study by RAMS (pp,35) in New Zealand.

3.6 Theoretical perspectives of adventure-based education

Adventure-based education uses experiential learning theory as its theoretical base to explain its learning benefits to the learners.

3.6.1 Experiential Learning Theory

Adventure-based education comprises the previously mentioned activities (chapter two) which present experiential challenges and opportunities for participants to learn and develop. These experiences may well aid individuals in self-development, in relationships and in becoming well adjusted members of a group:

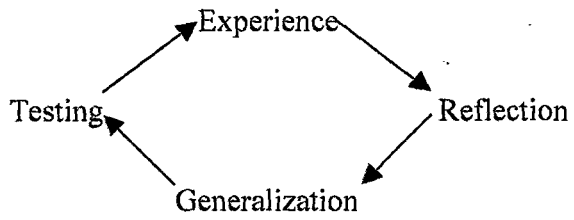
> Most outdoor education and adventure-based programs share theoretical perspective on experiential learning principles (Dewey, 1938/ 1996; Kolb, 1984) although there is no clear agreement on which of the several different types of experiential cycles is the most relevant to outdoor education. (Neill, 1994:6)

David Kolb (1984:20) argues that experiential learning theory offers a fundamentally different view to the learning process from that of the behavioural theories and therefore offers a very different prescription for the conduct of education. Hart (1990) according to Caffarella *et al.,* (1992:5), says that experiential knowledge is characterized as using one's personal experience and the experiences of others to inform the process of knowing.

Constructivist teaching allows learners to give meaning to or "make sense out of the perplexing variety and constantly changing textures of their experiences" (Caffarella *et al.,* 1992:2). She continues to say that this type of teaching assumes that learners are active knowers who participate in their construction of knowledge, and posits that novelty and change are part of most learning situations. Novelty and change are dynamic factors relating directly to the child's immediate context or environment. The environment albeit in the school, home or community is therefore the primary learning context of the child. It follows then that the nature of knowledge must be closely related to this learning environment and the experiences that it offers.

Kolb (1984:21) refers to the Lewinian model and its emphasis on a 'here and now' concrete experience to validate and test concepts. Kolb says that immediate personal experience is the focal point for learning, giving life, texture and subjective personal meaning to abstract concepts and at the same time providing a concrete, publicly shared reference point for testing the implications and validity of ideas created during the learning process. Finally Kolb makes the point that when human beings share an experience they share it fully, concretely and abstractly.

Kolb (1984:26) argues that knowledge is continuously derived from and tested out in the experiences of the learner. We learn about the world and about ourselves through reflection on past action and it is this relationship between action and learning that helps us construct our future action from reflections on our learning. Kolb (1984:21) describes this as a cycle of experiential learning illustrated in the diagram below:



Observing and then reflecting on an experience leads to making sense of that experience in a new way, leading to better understanding (Kolb, 1984:37). Finally Kolb defines learning as "... the process whereby knowledge is created through the transformation of experience" but adds that to "understand learning, we must understand the nature of knowledge, and vice versa" (1984:38). Kolb's view of knowledge here is similar to the constructivist model of understanding in that "... learners construct understanding" (Bodner, 1986:874).

3.6.2 Action Learning Theory

Action Learning is described by Mc Gill & Beaty (2001:11) as a continuous process of learning and reflection; through action learning individuals learn with and from each other by working on real problems and reflecting on their own experiences.

The extent to which Action Learning is a theory on its own is not clear. Mc Gill & Beaty (2001:19) argue that the most important aspect of action learning is the relationship between action and learning. They then describe this relationship as Kolb's cycle of experiential learning and claim that action learning and action research are based on the same learning cycle but are different only in that action learning is not "a research-oriented venture... but is essentially a group process" (Mc Gill & Beaty, 2001:21).

3.6.3 Usefulness of Experiential and Action Learning Theories

The Lewinian model, John Dewey model and Piaget's model of learning experience share strong similarities in terms of epistemology in that they do not view knowledge as a fixed entity. Learning is described as a process whereby concepts are derived from and continuously modified by experience (Kolb, 1984:26). This relates to the constructivist framework of this research in two ways, firstly the assumption that knowledge is not fixed and secondly that learners are continuously trying to making meaning of their experiences.

3.7 Critical reflection of this chapter

Large quantities of research is available on adventure-based experiences but there is a lack of scientific research that provides empirical evidence of the benefits of adventure-based experiences. This chapter serves to highlight this dilemma in showing that the research examples in this chapter are full of subjective assumptions on the benefits of adventure experiences. No empirical evidence is available to substantiate these claims and therefore are not convincing studies in this field.

Many writings on adventure-based programmes use experiential learning as their underpinning theory. This is most probably because of the generic nature of this theory, and may well serve as a broad description of the process of learning that happens during adventure-based activities. However, it does not provide an adequate framework for in-depth analysis of action in that it does not make allowances for all the possible influences on learning that can happen within an action-system. When a learner is involved in an action he/she forms part of a system involving the entire context, other people, roles of

the people, instructors, psychological factors like emotions (fears, self-confidence) or language, the environment or the objective of the action. In other words this study needs to capture what happens in the mind (cognition) of the participant when action occurs in an activity system. As action happens during adventure-based activities reflection occurs, decisions happen and change comes about in the learner's approach to solving the problem in order to fulfil his/her objective.

This study accepts the idea of experiential learning but chooses to ground the thinking about adventure-based activity in a constructivist view by using Yrgo Engeström's Third Generation Activity Theory. Engeström's theory helps the researcher to analyze the participant action that takes place during adventure-based activities and so to understand and identify the meta-cognitive strategies that are used by the learners to complete an activity successfully. This will be dealt with in greater detail in chapters five and six.

Chapter 4

The conceptual framework of this study

This chapter serves to define the underlying concepts that will facilitate an understanding of findings in this study.

Peters (1967) defines a concept as a mental construct or representation of a category that allows one to identify examples and non-examples of the category.

The focus of this study is the in-depth review of the adventure-based programmes being piloted at Lilyfontein School. This study ought to reveal the kind of impact that the content of these programmes has on the learners who are engaged in the adventure-based activities. It is therefore imperative that the underlying concepts where such impact can be measured or observed be highlighted and understood.

This chapter explains a few concepts that are critical to the validity of this study in that the understanding of the concepts below has a bearing on the reason for including adventure-based activities into the school's curriculum. The following concepts will be addressed to the extent that they will enhance the relevance of this study. The following are the concepts dealt with in this section:

- Risk in adventure education.
- The meaning and advantage of self-regulated learning.
- Self-esteem and self-efficacy and how this affects learning
- Meta-cognition, reflective thinking, problem solving and decision making in learning.

Finally these concepts will be specifically related to the National Curriculum Statement (NCS). These concepts will also be identified in the policy documents of the Revised National Curriculum Statement (RNCS) for Life Orientation in the grades R to 9 as well as in the grades 10 to 12 (NCS) documents. The purpose here is also to determine the relevance of the meta-cognitive elements as used in this study in relation to the

occurrence of meta-cognitive elements as stated in the new curriculum Learning Outcomes. This will reflect the expectations of the national Life Orientation Curricula.

4.1 The concept of *risk* in adventure-based education

The definition of adventure-based education in section 2.5.4 highlights the idea of risk in adventure-based education. It is imperative that a clear meaning of risk is established and that its role is in adventure education is explained.

The concept of risk is regarded as a fundamental ingredient of adventure-based education. Gair (1997:42) claims that fear is the key as participants face risks in dangerous but controlled situations. It is claimed that these risk type activities allow young people to develop by meeting and solving challenges which may well equip them to cope in their social environment. Douglas & Wildavsky (1982) suggest that risk is much more than rational decision making within a framework of known probabilities but is also part of the dialogue on how best to organize social relations (Douglas & Wildavsky, 1982:unpaged).

The type of activities done as part of adventure-based education would be activities like, abseiling, canoeing, rock climbing, parachuting, horse riding, cycling, mountain biking, high wire activities, high and low ropes courses, orienteering, raft building, bridge building, survival camps, group dynamic, team building tasks, adventure racing, etc. All of these activities have elements of risk attached to them albeit perceived or real risk.

Risk is an integral element in adventure-based education. Ewert, (1989:180) claims that learning, including improving one's self-concept, personal growth, leadership, and the opportunity for self-actualization is enhanced through risk. Adventure-based education provides opportunities for the individual and the group to solve problems. Ewert (1989:181) suggests that the fear or stress students' encounter in situations they perceive as risky "enhances decision making, discipline and personal awareness." The unfamiliar environment is posited as an equalizer amongst the students "as no one has the outdoor experience to be seen as the 'expert', so preexisting hierarchies may dissolve or be put aside, allowing people to begin to think for themselves" (Priest & Gass, 1997:1).

More detail concerning the concept of 'risk' and learners' abilities to handle emotions like fear and anxiety will be examined in chapters ten to thirteen.

4.2 The meaning and advantage of being a *self-regulated learner*

The purpose of this section is to provide an overview of self-regulation in order to give a clear exposition of the value of the attributes of self-regulation in learning. It also serves to point out the varying views on self-regulated learning and the all-encompassing character of self-regulation.

A clear understanding of the elements of self-regulated learning will allow one to identify the elements of self-regulation as learning components of adventure-based experiences. The logical consequence then is for an observer to make connections between the nature of the adventure-based experiences and the elements that promote self-regulation.

4.2.1 Origins of self-regulation

Self-regulation or self-regulated learning refers to the process whereby learners systematically direct their thoughts, feelings and actions towards the attainment of their goals (Schunk & Zimmerman, 1994:355). Zimmerman (1994) points out that research on self-regulation during learning began as an outgrowth of psychological investigations into self-control and the development of self-regulatory processes. This early research in self-regulation was conducted primarily in therapeutic contexts and had its theoretical roots in behavioural, developmental and socio cognitive psychology. Since then it has been interpreted in many different theoretical orientations (Schunk, 2000:355). Zimmerman and Pons (1986) point out:

> On the basis of existing literature, a number of categories of self-regulated learning strategies have been identified. The categories were drawn most heavily from social learning theory and research (e.g., Bandura, 1982; 1986; Schunk, 1984; Thorensen & Mahoney, 1974; Zimmerman, 1983). They included goal-setting, self-consequences, environmental structuring and self-evaluating. Other categories included, seeking and selecting information, transforming and organizing. (Zimmerman & Pons, 1986: 615)

Daniel Goleman (1998:318) of emotional intelligence fame defines self-regulation as: the ability to handle our emotions so that they facilitate rather than interfere with the task at

hand; being contentious and delaying gratification to pursue goals; and recovering well from emotional distress.

4.2.2 The conceptual framework for self-regulation

To address the question of what constitutes self-regulation, Zimmerman (1989) makes the point that a critical element in self-regulation, and one that makes it distinctive, is that learners have some available choices. It is this element that makes it distinctive from similar constructs like motivation, self-concept, self-efficacy, meta-cognition, self-monitoring, etc. (Schunk, 2000:356).

Schunk (2000:359) elaborates by stating that, concepts like "meta-cognition, comprehension monitoring, self-monitoring and self-evaluation", are cognitive activities that most likely brought into play during self-regulation, but that self-regulation is a far broader concept than any of the former as self-regulation includes these other processes. Self-regulated learners are meta-cognitively aware, monitor their understandings and performances, and evaluate their goal progress and competencies.

Finally, many concepts denote processes that are capable of being regulated. Self-regulation may include many of the above processes and more but is not limited to them. However, for the purpose of this study a distinction needs to be made between self-control and self-regulation, as it has a bearing on the nature of learning that happens through adventure-based activities.

In self-control, the child complies with a command or request in the absence of the caregiver; that is, the child complies with and responds to an internalized caregiver command. In self-regulation, on the other hand, a self-formulated plan of action, rather than an internalized command, guides the child's activity. Put another way, self-controlled behaviour is a rigid response to an outside given, but the capacity for self-regulation is the child's capacity to plan, guide and monitor his or her own behaviour or action. This implies flexibility according to changing circumstances and an ability to follow self-formulated goals or objectives. According to Claire Kopp's (1982)

developmental review it differs in its active use of reflection and meta-cognitive strategies (Diaz, *et al.*, 1995:129).

A brief outline of how the different theoretical perspectives interpret self-regulated behaviour will serve to highlight its range of dimensions.

4.2.3 Theoretical perspectives of self-regulation

- *Reinforcement theory perspectives* and views on self-regulation according to Schunk (2000:358) derive mainly from the work of Skinner; operant behaviour is emitted in the presence of discriminative stimuli. Self-regulated behaviour involves choosing among alternative courses of action, typically by deferring an immediate reinforcer in favour of a different, and usually greater, future reinforcer (Mace *et al.*, 1989, as cited in, Schunk, 2000:359).
- *Developmental theory perspectives* on self-regulation according to Schunk (2000:365), conceive of self-regulation in terms of progressive cognitive changes that allow them to exert greater control over their thoughts, feelings, and actions (Schunk & Zimmerman, 1994). Schunk (2000) refers to Claire Kopp (1982) who points out that self-regulation involves actions such as:

> ...the ability to comply with a request, to initiate and cease activities according to situational demands, to modulate the intensity, frequency, and duration of verbal and motor acts in social and educational settings, to postpone acting upon a desired object or goal, and to generate socially approved behavior in the absence of eternal monitors. (Kopp, 1982:199)

- *The Social cognitive theory* emphasizes the interaction of personal, behavioural, and environmental factors (Zimmerman, 1989:372). Social Cognitive theory views self-regulation as comprising of three processes: self-observation, self-judgement and self reaction (Zimmerman, 1989:374). Self-regulation is a cyclic process because these three processes typically change during learning and must be monitored. Such monitoring leads to changes in an individual's strategies, cognitions, affects and behaviors (Zimmerman, 1989:372).

4.2.4 Social origins of self-regulation

One of the most detailed accounts of the development of self-regulation can be found in the works of Lev Vygotsky, a Russian psychologist. Chapter five (see pp.76-78), gives a detailed study of Vygotsky's theories and their influence on learning. Diaz *et al.* (1995:127) point out that a central theme in Vygotsky's developmental theory is that cognitive development can be understood as the transformation of basic, biologically determined processes into higher psychological functions. Further readings of Vygotsky by Diaz *et al.* (1995:127) suggest that this "transformation" from basic to higher functions consists mostly of an increasing self-regulation of processes and capacities that are originally bound to and controlled by a concrete, immediate stimulus field. The child achieves self-regulatory capacities by actively manipulating the environment with the use of signs, and in so doing constructs meaning in a social cultural manner. Furthermore Diaz *et al.* (1995:129) propose that self-regulatory capacities develop within the context of adult-child interactions.

According to Vygotsky, the developmental progression on the road to self-regulation can be seen as a social process and indeed, a major theme in Vygotsky's developmental theory is that children use language not only to communicate but to guide, plan and monitor their activities. Language or children's 'private speech' according to Vygotsky plays a significant part in how self-regulatory processes develop (Diaz *et al.*, 1995:141).

Alexandria Luria, a colleague and student of Vygotsky, addresses the development of self-regulation in terms of a human's capacity for conscious, voluntary action. Luria supported Vygotsky and also argued that the voluntary act is first a shared social event before it becomes an intra-psychological function or a self-regulated action (Diaz *et al.*, 1995:137).

According to Zimmerman and Pons (1986: 615) self-regulation has been variously labeled as "self-controlled," "self-instructed," or "self-reinforced," learning to draw attention to the importance of self-regulation processes.

4.2.5 Teaching for self-regulation

Diaz *et al.,* (1995:138) point out that studies of parental teaching styles and child rearing patterns suggest that three characteristics promote capacities related to self-regulatory functions. These are: the use of reasoning and verbal rationales, the gradual relinquishing of control, and these are combined with a sense of affective nurturing and emotional warmth.

According to Diaz *et al.*, (1995:139) Jerome Bruner's concept of "scaffolding" refers to detailed adult interventions to regulate children's mastery of a given task but the gradual withdrawal of adult control and support is an important function of children's mastery of a given task.

Vygotsky's zone of proximal development (ZPD), defined as "the distance between the actual development level as determined by independent problem solving and the level of potential problem solving under adult guidance or in collaboration with more capable peers" (Wertsch, 1995:18) has similar implications, (see chapter five, pp.87-88).

Diaz & Neal (1995:140), inspired by the concepts of *scaffolding* and the *zone of proximal development,* suggest three major factors in the origins of self-regulation. Firstly, the child's cognitive or problem solving ability is initially socially regulated by the adult in joint interaction. Secondly, the child's successful takeover of the regulatory role involves the active redefinition of the problem situation in terms of the adult's goals and perspectives, with a gradual increase in the child's responsibility for the task at hand. Thirdly, the process from other to self-regulation, from joint to independent problem solving, does not simply happen automatically or by chance but rather involves very specific teaching interaction on the part of the adult. Both Vygotsky and Luria agree on the regulatory role that language plays in becoming a self-regulated learner.

Effective self-regulation requires having goals and the motivation to attain them (Zimmerman, 1989:355). Learners must regulate not only their actions but also their underlying achievement –related cognitions, beliefs, intentions and affects. An increasing

body of research substantiates the prediction that self-monitoring of achievement beliefs sustains learning efforts and promotes achievement (Schunk & Zimmerman, 1989).

As to the importance of self-regulation in a learning setting Zimmerman and Pons (1986) say that:

> It is theorized that human achievement is heavily dependent on the use of self-regulation, particularly in competitive or evaluative settings (Thorensen & Mahoney, 1974; Zimmerman, 1983). In the upper grades, success in schooling is believed to be highly dependent on student self-regulation, especially in unstructured settings where studying often occurs. (Zimmerman & Pons, 1986: 615)

A critical aspect is that effective self-regulation depends on learners developing a sense of self-efficacy for self-regulating their learning and performing well. Positive self-evaluations lead learners to feel efficacious about learning and motivated to continue to work diligently (Zimmerman, 1994:60).

One of the goals of this study is to determine the extent to which adventure-based activities affect the learner's self-concept by developing in the learner a sense of self-belief, self-efficacy or a positive self-esteem that in turn will contribute to effective self-regulating capabilities in the learner. It is therefore critically important that these related concepts are clarified.

4.2.6 Self-efficacy and attributions in self-regulation

The paragraph above refers to the concept of self-efficacy which is another model relating to self-esteem and needs to be considered briefly as this model also proposes the significance of the learner's perceptions of competence. Self-efficacy also has a bearing on self-regulated learning. This section aims to clarify the concepts of self-efficacy and attributions, emphasizing their relationship to self-esteem. Self-esteem will be dealt with in section 4.3.

The concept of the self-efficacy theory has been applied by Bandura, who was responsible for the development of a socio cognitive model of behaviour. Bandura and others have applied this model in a variety of domains including mental health, business, athletic performance, career choices and academic achievement (Pintrich, 1996). In the

educational domain Schunk (1991) has been the leading theorist and researcher of aspects of self-efficacy. In this self-efficacy model, Schunk (2000:106, cites Bandura,1986) as defining self-efficacy as "people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performances".

Perceptions of competence concern students' judgements of their capability in a domain and, hence are more cognitive evaluations, whereas self-esteem is a more affective and global reaction to self. Finally, Pintrich (1996) maintains that research has consistently shown self-efficacy beliefs to be related to academic achievement and performance on standardized tests and actual school tasks in addition to self-reporting measures of cognitive engagement and self-regulated learning.

- S*elf-monitoring* is a subsection of this theory and is the process by which students become aware of existing behaviours. This assists them in improving those behaviours, especially if self-monitoring is combined with goal setting. The students are then taught how to use tools, e.g. reviewing or recording, to help them achieve their goals. Research supports the benefits of self-monitoring on achievement outcomes and according to (Zimmerman, 1989:360), monitoring progress enhanced children's progress and self-efficacy.
- *Self- instruction* refers to discriminative stimuli that set the occasion for self-regulatory responses leading to reinforcement and in some cases may take the form of statements that serve to guide behaviour. Self-instructional statements have been used to teach a variety of academic, social and motor skills (Zimmerman, 1989:362)
- *Self-reinforcement* refers to the process whereby individuals provide themselves with a reinforcement contingent on their performing a response and that increases the likelihood of future responding. According to Bandura (1986), as cited in Schunk, 2000, much research shows that reinforcement contingencies improve performance but some studies will refute these claims as the results are not clear. Self-reinforcement is hypothesized by O'Leary & Dubey (1979) to be an effective component of self-regulated behaviour, but the reinforcement may be more important than the agent of reinforcement (Zimmerman, 1989:364).

Schunk (2000:108) uses Bandura's (1977) definition to explain that self-efficacy refers to personal beliefs about one's capabilities to learn or perform actions at designated levels. Self-efficacy refers to perceptions of one's capabilities to produce actions. Self-efficacy is the belief about what one is capable of doing and is not the same as knowing what to do. For example, a student may believe that he will get positive recognition from a teacher if he answers the question correctly (which he desires), but may not attempt the answer if he doubts his capabilities (low self-efficacy). Research shows that self-efficacy is domain specific (Schunk, 2000:108); it has to do with perceived capabilities in certain domains: "I am confident in swimming not in rock climbing". The self-concept on the other hand is according to Schunk (2000), one's general self-perception that includes efficacy in different areas.

According to Schunk (1994:75), research substantiates the idea that self-regulation depends on learners' feeling efficacious about performing well and forming attributions that sustain learning efforts. Attributions are the meanings that students attribute to their performances in different situations. According to Schunk (1994), attributions form part of self-regulation when self-judgment and self-reaction happens when students compare and evaluate their performances. Schunk further says that "Effective self-regulation depends on students making attributions that enhance self-efficacy and motivation" (1994:82).

Schunk's research experiments in 1983, 1984, 1989, (Schunk, 2000:87) show clearly that attributional feedback (information that allows a learner to develop positive self-belief of ability) is critical to self-efficacy which contributes to self-regulated learning. Most studies show a positive correlation between ability attributions and self-efficacy (Schunk, 2000:87).

4.3 Self-esteem and how it affects learning

The purpose of this section is to operationalize the concept of self-esteem as it is commonly understood and used in this study. However, to avoid being overly simplistic, the researcher will firstly review the construct of self-esteem and some of its related

notions before establishing a definition of self-esteem for the purpose of this study. The results of this study have a bearing on self-esteem and on the understanding of self-esteem and how it is enhanced through adventure-based programmes offered at Lilyfontein School. The reason for this is that studies frequently show that the self-esteem of a learner has a marked influence on his/her capacity to be a self-regulated learner.

Discussing what is meant by the self appears to be trite and significant at the same time. On the one hand living as humans do, by thinking and talking, presupposes a 'self' as being part of our very nature and on the other hand the self is a profoundly significant notion in contemporary culture (Forrester, 2000:84). Forrester (2000:85) points out that in Western society we are encouraged to search for our 'real' selves, we talk of adolescence as a period when our sense of self-identity is fragile and incomplete, we aspire to self-fulfilment and are encouraged, whatever else we do, to be our (true) selves.

Forrester (2000:84) makes the obvious but necessary point that we are all familiar with the elaborate discourse surrounding the endless list of the polysemous word, the self, which includes: self-esteem, selfishness, self-identity, individuation, ego, higher-self, self-actualisation, self-consciousness and even the more abstract notions like self-reflection, self-taught and even self-destructiveness. Academic discourses on the self show conflicting philosophical positions on the idea of **self**. Western psychology, as the science of mental life and behaviour, has a long tradition of theories and images of the self.

Given the ambiguous nature of the word "self-esteem", greater clarity of the terminology and its conceptual attributes need to be highlighted.

4.3.1 Origins of the concept of self-esteem

The nineteenth-century American psychologist William James was probably the first to employ the experimental psychological, rather than the philosophical, approach to the study of the self (Mc Grath,1992:17). James points out the paradoxical nature of our being able to stand back from ourselves and view our own consciousness as a subject of study (today called meta-cognition). James found it necessary to distinguish two aspects

of the self – the self as *known* and the self as *knower*. The capacity for self-consciousness is most probably closely related to the development of language. As such it is arguably unique to humankind.

James believed that each person's "self-concept" is the view of the known self that is held by the knower. The known self has material, social and spiritual components (McGrath, 1992:17).

Sigmund Freud, a psychoanalyst who lived in Vienna in the late nineteenth and early twentieth centuries, worked out important theories about the development of personality. These theories were very innovative and made a significant contribution to the topic of self-esteem.

Many psychologists over the centuries have used the notion of the "self" as an underlying aspect of their approach. McGrath (1992:21-29) names a few:

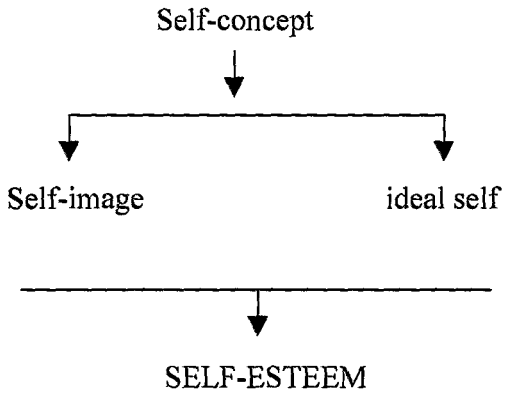
- The aim of psychotherapists like Karen Horney was therefore to change the way a client viewed the self in order to improve the quality of interaction with others.
- Aaron Beck thought of the personality as a complex collection of mental mind maps he called self-schema, which comes about through self-evaluation.
- Carl Rogers's client centred approach to psychotherapy held that there is a superficial or false self that is experienced through the individual's habitual behaviour and as a result of the values of others.
- Abraham Maslow advocates self-actualization as the basis for healthy personality function. Maslow's hierarchy of need included the importance of self-esteem.

4.3.2 What is the self-concept?

People all have their own idea of what is meant by the term self-esteem. In fact a simplistic testing of this understanding with ten teachers in both the primary and high schools at Lilyfontein revealed exactly what Lawrence (1996:1) states: "... in any discussion of self-esteem amongst a group of teachers there are likely to be several different definitions". He continues by claiming that this position by teachers is

understandable when one considers that literature has only until fairly recently tended to use many terms like these to mean the same thing.

Lawrence (1996:2) explains the concept of self-esteem through the following representation of the components of self-esteem as depicted in the diagram below:



Lawrence (1996:1) sees the self-concept as the sum total of an individual's mental and physical characteristics and his/her evaluation of them. Schunk (2000:108) claims the self-concept as one's general perception of ability. As such it has three aspects; the cognitive (thinking); the affective (feeling); and behavioural (action).

In practice and from a teacher's point of view, it is useful to consider this self-concept as developing in three areas – self-image, ideal self and self-esteem. The self-concept is seen as an umbrella term considering the self-image (what the person is); the ideal self (what the person would like to be); and self-esteem (what the person feels about the discrepancy between what he/she is and what he/she would like to be). In order to clarify further, each of these terms needs to be explained.

According to Lawrence (1996:3-5) the individual's ***self-image*** is the awareness of his/her mental and physical characteristics. It begins in the family where the child learns he/she is loved or not loved, or learns of being clever or stupid. This process continues into the school-experience where his/her image of his/her self is reinforced. Here children also learn how well they can do at mental and physical tasks and also acquire a sense of how popular they are with other children. The more the experiences, the richer the self-image.

This process of development according to Lawrence (1996:6) is not only related to feedback from others, but is also one of reflecting on their own actions as cognitive abilities. Such reflection enables individuals to reflect on their experiences and interpret these, and in so doing formulate an image (positive or negative) of themselves.

Side by side with the development of the self-image, the child is learning that there are ideal characteristics that he/she should possess – that there are ideal standards of behaviour and also particular skills which are valued by society. The child is becoming aware of the mores of society: comparison with peers during adolescence or the influence of the media become significant factors providing models of aspiration.

Lawrence (1996) reinforces the view of some psychologists who claim that our early experiences may continue to influence our present behaviour to some extent although we all have the potential for becoming self-determinate. The schoolchild is most likely to be at the stage of accepting the ideal images from the significant people around him/her and striving to a greater or lesser degree to attain them.

As mentioned above, self-esteem is the individual's evaluation of the discrepancy between ***self-image*** and the ***ideal self***. Lawrence (1996:5) then makes the point that this process of evaluation is an affective process and is the measure of the extent to which the individual cares about this discrepancy. From the above discussion on the development of the self-image and ideal self, it can be appreciated that the discrepancy between the two is inevitable and so can be regarded as a normal phenomenon. In fact this discrepancy, according to Lawrence (1996:6) is very necessary for positive growth but depends largely on the influence of the child's significant people in his/her life.

An over anxious parent may well cause feelings of failure in the child for not living up to the expectations of the parent. This failure, although only in a particular area, may well translate into general feelings of failure as a person. Lawrence (1996:6) goes on to make a further point that unrealistic demands may result in low self-esteem, but no demands at all may result in no achievement. It is therefore not the failure as such but rather how the child's significant other reacts to the failure. Clearly then there must be an optimum

amount of pressure – just enough to cause the child to care but not too much so that he/she becomes distressed.

4.3.3 The importance of a positive self-esteem

The acquisition of a sense of self-worth is a major developmental task of childhood. It is a continuing process which starts in infancy, and continues throughout childhood and adolescence; indeed it does not stop when a person enters adulthood (Barker, 1992:33).

As Erikson (1950), among other developmental psychologists, points out, middle childhood is an important time for the development of self-esteem, a positive self-image or self-evaluation. Children compare their real selves and their ideal selves, and judge themselves by how well they measure up to the social standards and expectations they have taken into their self-concept and by how well they perform (Papalia & Olds, 1992:278).

Papalia & Old (1992:278) go further to say that children's opinions of themselves have tremendous impact on their personality development. Indeed, a favourable self-image may be the key to success and happiness throughout life. This is reflected further in Lawrence's (1996:13) claim that a child with high self-esteem is likely to be confident in social situations and in tackling school-work. The child with low self-esteem, by contrast, will lack confidence in his/her ability to succeed. Consequently, he/she may try to avoid situations which he/she sees as potentially humiliating. William James (1890) said "With no attempt there is no failure; with no failure no humiliation"(cited in Frager & Fadiman, 1984:243). Rather than tackle new work and risk feeling stupid, children may well rather face the wrath of the teacher for not doing the work and in so doing appear to be something of a hero in the eyes of their classmates.

This rather strange choice may be explained by Carl Rogers (1961) who draws our attention to the prime need in our culture for self-regard and the need to preserve self-esteem (cited in Lawrence, 1996:8). Because we need to be liked and valued, this drive to preserve self-esteem may be at the cost of logical thinking but at the same time may act, according to Lawrence (1996:9), as a motivator.

On common sense grounds one would expect children with high self-esteem to do better in class than children with low self-esteem. This is supported by research which consistently shows a positive correlation between children's self-esteem and their levels of attainment (Lawrence, 1996:11). However, the correlation studies reveal a figure around 0.6, which indicates the possibility of other factors playing a part in learner achievement. Lawrence proposes the importance of the part played by the personality of the teacher or significant other. A startling research finding is the high correlation between children's self-esteem and teacher self-esteem, indicating the teacher's powerful position to influence the children's self-esteem and in turn influence their achievements and behaviour (Lawrence, 1996:11). This study considers strongly the teacher influence when reviewing and making sense of evidence.

Schunk (2000:321) makes the point that students who are confident of their learning abilities and feel self-worthy display greater interest and motivation in school, which enhances achievement. Higher achievement, in turn, validates self-confidence for learning and maintains high self-esteem. Schunk (2000) then adds that these ideas are not consistently supported by research and that Wylie's (1979) research reveals that the general correlation between academic achievement and self-concept was +30, an indication of a positive relationship between achievement and self-concept. But, although the direction of the influence is unclear, we can reasonably assume that self-concept and learning affect one another. The student's perception of competence has a bearing on actual competence.

Coopersmith (1967:193), declares that since ability is only one of the factors that enter into academic performance, the attitudes, beliefs and feelings associated with the self-concept and self-esteem have an important influence on how closely a child approaches his potential. In the case of this study the idea of 'self-confidence' will be taken to have the same, if not similar, meaning as self-esteem or self-efficacy.

4.3.4 The importance of the self in self-regulation

The affective dimension has to do with negative and positive self-conceptions often referred to as self-schemas, which may well play significant roles in the self-concept formation. According to Garcia & Pintrich (1994), self-schemas have a few advantages for theories of self-regulation:

> First, self-schemas are a means of putting the self in the foreground of 'self-regulated learning'. McCombs (1989) argued for a phenomenological approach to self-regulated learning, one that emphasized personal construal and meaningfulness. She charged that educational psychologists doing work in self-regulated learning have narrowly focused on the regulation aspect and have largely ignored the self aspect. In the same vein, (Borkowski, Carr, Rellinger, & Pressley, 1990) contended that researchers should pay greater attention to the self, because beliefs and affective evaluations about the self are what provide the incentives for self-regulatory behaviors. (Garcia & Pintrich, 1994:133)

4.4 Meta-cognition, reflective thinking, problem solving and decision making

These terms are all very current and popular in education. They too form a polysemous group of ideas relating to the following terminology: meta-cognition, comprehension monitoring, self-monitoring, self-evaluation, self-regulation, problem solving, decision making, reflective thinking, thinking skills, reflective access, executive decision making, problem solving, etc.

The nature of this study will only include the following aspects as part of the elements that claim to be enhanced through students doing adventure-based activities. These are meta-cognition, reflective thinking, problem solving and decision making.

4.4.1 Meta-cognition

Brown (1987:66) refers to meta-cognition loosely as one's knowledge and control of one's own cognitive system or, put another way, meta-cognitive skills entails the operation of specific mental processes by which individuals organize and monitor their own thinking.

Bruner (1996:64) makes a very strong case for meta-cognition when he says that modern pedagogy is moving increasingly to the view that the child should be aware of her own

thought processes, and that it is crucial for the pedagogical theorist and teacher alike to help her become more meta-cognitive – to be aware of how she goes about learning and thinking as she is about the subject matter she is studying.

In a very direct sense reflective thinking and meta-cognition have the same features by which learners think about what they are doing, apply certain techniques to improve or adjust their activities. Brown (1987:67) talks about "meta-cognitive skills" which entail the operation of specific mental processes by which individuals organize and monitor their own thinking. Brown (1987) continues to argue that cognitive activities, such as checking, monitoring, planning and prediction contribute to cognitive performance of the type investigated by developmental psychologists and that these meta-cognitive skills are the basic characteristics of efficient thought. Brown cites Flavell's (1976) claim as to how these meta-cognitive skills improve children's problem solving capacities.

Brown (1987:67) states that meta-cognition is the deliberate conscious control of cognitive activity. Flavell (1987) says that meta-cognition has as its core meaning 'cognition about cognition' or 'thinking about thinking'. Flavell says that:

> Meta-cognitive skills are believed to play an important role in many types of cognitive activities, including reading, writing, communicating, problem solving, social cognition, self-instruction and self-control. (Flavell, 1987:104)

According to Zimmerman in Schunk (2000:179-181), self-regulated learning requires that students decide which learning strategy to use prior to engaging in a task. While students are engaged in the task they assess task progress using meta-cognitive processes. Corno & Mandinach (1983:94) state that self-regulated learning, which represents the highest form of cognitive engagement, is epitomized by the task appropriate use of information acquisition and transformation, but that meta-cognitive control processes are also an important component of this concept. Furthermore, meta-cognitive skills involve strategies like planning and re-planning, receiving, encoding and tracking information, monitoring, evaluating, motivation, and emotional control of performance anxiety. Daniels (2001:100) summarizes Vygotsky's ideas on self-regulation by saying that meta-cognitive mediation refers to children's acquisition of semiotic tools of self-regulation, self-planning, self-monitoring, self-checking and self-evaluation.

Flavell (1987:25) goes further to state that concepts that might be related to meta-cognition include: executive processes, consciousness, social cognition, self-efficacy, self-regulation, reflective self-awareness and the concept of psychological self or psychological subject. The nature of this research is about analyzing meta-cognitive strategies and therefore should consider a point made by Weinert (1987:9). Weinert (1987) suggests that serious consideration should be given to the extent to which an individual's meta-cognitive judgements correspond to the actual state of affairs, whether the judgements are about abilities, learning strategies, or task difficulty. These concepts will play a fundamental role in analyzing data this research.

4.4.2 Reflective thinking

Being a reflective thinker (sometimes reflexive is used by some authors) assumes the capacity to think about what one is doing with the intention of and actually improving one's action. Ann Brown (1987:69) refers to it as the essentially human ability to step back and consider one's own cognitive operations as objects of thought, to reflect on one's own thinking.

Loughran (1996:3) cites Boud, Koegh and Walker (1985) who see reflection as an important human activity in which people recapture their experience, think about it, mull it over and evaluate it. It is this working with experience that is important in learning. The capacity to reflect is developed to different stages in different people and it may be this ability which characterizes those who learn effectively from experience.

Brown (1987:70) highlights John Locke's (1600s) interest in children's knowledge of their own knowledge. Locke distinguished between two primary sources of ideas: (i) sensation and reflection and (ii) "perceptions of the state of our own minds". Brown points out the significance of the recurring theme in psychology between multiple and reflective access and that these concepts are key issues in the field of meta-cognition and in developmental psychology.

4.4.3 Problem solving and decision making

Brown (1987), cited by Kluwe, (1987:32) claims that executive decision making deals with the course and the organization of own mental activity and, therefore, is part of procedural knowledge. She maintains that studying the procedural attributes of different problem solving processes is important as it shows the flexibility of intra-individual thinking processes. Brown (1987:86) quotes on the one hand Simon & Simon (1978) as well as Sternberg's (1979) studies on problem solving and executive decision making. These studies reveal that more definitive research is required in this domain. On the other hand, studies by Reither (1979), maintain that the effects on cognitive performance by reflecting on one's own problem solving is impressive.

Brown (1987) reaches this very important conclusion:

> The resulting picture of human thinking, therefore, is not one of an always predetermined sequence and mode of information processing. Instead, the individual may: decide about cognitive processes; interrupt, accelerate, slow down own thinking directed towards certain goals; increase the intensity of own thinking; or deliberately maintain or continue the specific course of thinking. It is, therefore, assumed that executive decisions contribute to age-related variations and to intra and inter-individual differences in thinking. (Brown, 1987:106)

4.4.4 Concluding remarks

In drawing all these concepts together I would like to illustrate the interrelated nature of many of the concepts, constructs and notions associated with self-regulated learning through a number of extracts from different writers.

- Zimmerman (1994:) maintains that effective self-regulation depends on students developing a sense of self-efficacy for self-regulating their learning. Of critical importance is the process of self-evaluation of capabilities; this comprises both self-judgements of current performance and comparing this to one's goals.
- Furthermore, effective self-regulation requires having goals and the motivation to attain them (Bandura, 1986 & Zimmerman, 1989).

- Social cognitive theory views self-regulation as comprising self-observation, self-judgement and self-reaction. Learners enter learning activities with goals such as acquiring knowledge and problem solving strategies, finishing work and completing experiments (Zimmerman, 1989:355)
- Although self-regulation and motivation are not synonymous, they are related. Processes such as goal setting, self-efficacy and outcome expectations are important motivational variables that affect self-regulation (Zimmerman, 1994)
- From an information processing perspective, self-regulation is similar to meta-cognitive awareness requiring the learner to plan, monitor and evaluate his/her progress (Schunk, 2000).
- Other regulation by supportive others: peers, parents, teachers, etc.is important. Vygotsky argues that all psychological processes are initially social, shared between people, and over time through language and experiences becomes intra-personal (internalized) (Wertsch, 1993:28).
- Self-regard and self-worth mean essentially the same as self-esteem.
- Self-schema, self-awareness, self-knowledge, self-appraisal and self-concept are names for the non-evaluative process on which self-esteem is based.
- Self-reliance and self-efficacy refer to constituent elements of self-esteem, related to competence (McGrath, 1992).

In the late 1970s and 1980s much was written by a range of authors on the topic of learning related to thinking processes. Many articles were written on the cognitive processes involved in effective thinking skills. In order to illustrate the paradigm of that time an article in *The Educational Leadership Magazine* (May, 1986) is useful. The article was titled "Decision making: New paradigm for Education" and subtitled; "Schooling should focus not only on knowledge but on the decision making skills students need to use knowledge intelligently."

Over the years analytical thinking, critical thinking, intuitive thinking, meta-cognitive thinking, reflective thinking, reflective access, problem solving, decision making, meta-memory, meta-knowledge, to name but a few, certainly raise the question of the extent of

difference or similarity. Perhaps this merely reveals semantic changes that evolve out of the necessity to best fit the speak or fashion at the time.

The following points are imperative to the goals of the action research study being conducted at Lilyfontein School:

1. Firstly, self-regulation refers to self-generated thought, feelings, and actions that are systematically oriented towards the attainment of goals. Self-regulation during learning involves personally activating and sustaining goal-directed cognitions and behaviors. Different theoretical perspectives emphasize various processes involved in self-regulated learning, including attention, rehearsal, use of strategies (meta-cognitive strategies, reflective thinking), comprehension monitoring, self-instruction, and self-reinforcement. Regardless of theoretical tradition, self-regulation fits in well with the constructivist spirit of this study and the notion that students contribute actively to their learning goals and do not passively receive knowledge but rather actively construct it (Zimmerman, 1989:355).
2. Secondly, acknowledgement that research highlights the importance of the learner having the capacity to make effective decisions in order to be able to use the above techniques in a self-regulated manner to solve everyday or academic problems.
3. Thirdly, the nature of the rigours and demands of adventure-based activities help to mediate learners into becoming better self-regulated learners.

4.5 Relevance of the above concepts to the Revised National Life Orientation Curriculum (RNCS) (2002).

The detailed analysis of the Revised National Curriculum Statements (RNCS: Grade 7, 8 and 9) and the NCS (Grade 10,11 and 12) for Life Orientation in chapters seven and nine has extracted concepts that are a prerequisite to the delivery of the curriculum Learning Outcomes as they apply to Life Orientation in the school context.

The list of words below has been extracted from of the RNCS (Grade R to 9) and the NCS (Grade 10-12) for Life Orientation (DoE, 2002a, 2002b). These words have been

lifted directly out of the assessment standards contained in each of these documents. The assessment standard is defined as the knowledge, skills and values that learners need to show to achieve the Learning Outcome in each grade (NCS document, DoE, 2002b:61). This list of words represents the knowledge and concepts or ideas, skills and values which are required by the assessment standards to be achieved by the learners.

These words, ideas or concepts will be recognized as being directly associated with the concepts that were discussed earlier in this chapter and which form the theoretical basis of this study. In order for learners to become effective self-regulated learners they have to master a range of meta-cognitive abilities. These abilities incorporate skills such as planning, goal setting, self-evaluation, self-motivation, problem solving, decision making, to mention a few, that learners can acquire during appropriate activities and consequently become better self-regulated learners.

The following are the concepts contained in the prescribed Assessment Standards of the National Life Orientation curriculum for Grade 7 to 12.

Goal setting
Self-planning
Problem solving ability.
Self-reflection
Self-improvement strategies
Self-evaluation
Conflict management
Positive Self-concept formation
Emotional coping
Self-management skills in difficult situations
Self-motivation
Decision making
Coping with change

The concept of the learning area of Life Orientation captures the essence of what this learning area aims to achieve. It guides and prepares learners for life and its possibilities. Life Orientation is central to the holistic development of learners. It is concerned with the social, personal, intellectual, emotional and physical growth of learners, and the way in which these facets are interrelated. The focus is the development of self-in-society (RNCS, Grade R-9, DoE, 2002a:4). It is the researcher's deduction that the extracted concepts above are the foundational meta-cognitive facets of the intended curriculum of Life Orientation.

4.6 Reflection on this chapter

This chapter highlights the concepts that this study encompasses in order to illustrate the significant influence that adventure-based activities has on self-regulated learning. This chapter also points out that meta-cognitive skills incorporate a range of 'life skills' or techniques that learners can absorb through practice in order to become self-regulated learners. One of the aims of this study is to provide evidence to show that engaging in adventure-based activities helps mediate the necessary learning to develop meta-cognitive strategies.

This research takes meta-cognitive strategies (MCS) to include a range of cognitive elements or strategies like self-planning, self-reflection, self-monitoring, self-evaluation, self-motivation, self-esteem, self-improvement strategies, problem solving, decision making, emotional coping and fear management, etc. This study also highlights the occurrence of these meta-cognitive elements in the National Life Orientation Curriculum of 2002.

All of these concepts will be applied within the framework of Engeström's third generation Activity Theory Model as seen in the following chapter (see chapter five) in order to highlight the learning that takes place through adventure-based programmes.

Chapter 5

The theoretical framework

The purpose of this chapter is to present a theoretical framework that will best accommodate and integrate the nature of learning that happens when learners are engaged in adventure-based type activities. As fully described in chapter two, the nature of adventure-based activities are contextually real activities. These activities demand from the participants rigorous problem solving and personal challenges as well as group cooperation through activity-based tasks. The dynamics of such adventure-based tasks require from the participants the ***individual capacity*** to plan, think reflectively, evaluate situations, make decisions, as well as a more ***collective ability*** to communicate using appropriate language, listen to others, share ideas, work in a group, empathize, read body language, and recognize and appreciate the contribution made by others. This dynamic is within keeping of the socio-cultural framework of this study.

This study aims to ensure that the underlying theoretical position taken mirrors the action or active nature of the study. This study therefore has a dual purpose. Firstly, to determine the part played by adventure-based activities in mediating the development of self-regulated learners. Secondly, it has an on going evaluative purpose through an action research component, to determine the 'applicability' (Rossman & Rallis, 1998:47) of adventure-based activities in Lilyfontein's school curriculum,

5.1 The problem of finding a relevant theoretical framework for this study

Chapter three of this study points out that, according to some adventure-based researchers and writers like James T. Neill (1994), the generally accepted theory that underpins adventure-based activities appears to be Kolb's experiential learning theory. In some cases reference to action learning has also been found (Attarian, 2002). The researcher pointed out in chapter three that the experiential learning cycle has a few fundamental limitations as an analytical tool, and therefore does not provide an adequate explanation of the participant's action within a system of learning. It gives scant or no attention to the

part played by language or dialogue. The influence of the context and other people in the action system are also not clear, i.e. the socio-cultural context. It also does not allow for the importance of interpreting the effects of the dynamic nature of external instruction or the various psychological elements that form part of any interacting system where learning and change is a feature.

Having said this it must also be acknowledged that the experiential learning cycle does play a part in the ongoing reflection used in the action research component of this study.

With regard to the empirical study of participants' action this research has therefore chosen its philosophical underpinnings in a socio-cultural (Vygotskian) approach to learning. Emanating from this socio-cultural approach Leont'ev's (1981) notion of activity theory is used through Engeström's (1987) third generation interpretation of activity theory. This theoretical position assumes a socio-cultural formation of mind developed on the basis of Vygotsky's (1978) work. This approach has the purpose of recognizing and retaining the importance of the influence of language in this learning process. Language is not regarded in isolation, but is seen as part of the learning system which involves other people, artifacts, rules and roles.

> Cultural-historical activity theory (Leont'ev, 1978, Engeström, Miettinen & Punamaki, 1999) is a recent arrival in the western scene of practice-based organizing theory. Activity theory is commonly received primarily as a psychological theory that offers a fresh cultural and mediational angle on cognition and language. I argue that activity theory has an original and potentially powerful approach to the social construction of knowledge. (Engeström, 2000:301)

The theoretical exposition here will provide discussion on the nature of learning and knowledge from a socio-constructivist perspective but will also focus on concepts like: mediated activity, distributed cognition, dialogic inquiry, the Zone of Proximal Development (ZPD) and the expansive learning cycle. All these aspects and elements contained within the idea of activity theory help to promote and enhance learning in order for learners to become better self-regulated learners. As part of this chapter I will endeavour to interpret the theoretical aspects into the practical reality of the adventure-based activities.

In doing this I must acknowledge the different positions and assumptions relating to activity theory, socio-cultural and socio-historical approaches in respect to their contradictions, dilemmas, limitations and contentions relating to pedagogy which are held by different theorists. This chapter will, however, only make mention of such shortcomings as far as they affect the purpose of this study and will not enter into extensive debate on these limitations.

5.2 Introduction

Researchers in the scientific behaviourist tradition are concerned with human behaviour; interpretive researchers are concerned with human action. Interpretation is a fundamentally human activity (Murray, 2003:5). The interpretive paradigm consequently has a different view to the nature of learning and ontology from that of the behaviourist theories of learning (Packer & Addison, 1989). On the one hand the behaviourist's learning theory is based more on a logical empiricist epistemology (positivism) and, on the other hand and juxtaposing this view, is the notion that learners actively engage in constructing their own knowledge. This self-construction of knowledge is orientated towards a more cognitive epistemology within a social constructivist paradigm (Wortham, 2001:116).

Epistemological assumptions are critical to the formulation of research goals and tracing the path that a study aims to follow, as education aims to be about successful learning. Wortham (2001:115) clearly makes the point that beliefs about knowledge inform, justify and sustain our practices of education.

This research is about engagement in adventure-based activities and is concerned with how learners construct their knowledge and learn to develop support techniques, tools and skills for general application in life (self-regulation). This research therefore operates within the interpretive paradigm as it takes the position that the social realm is different from the natural sciences realm and therefore cannot be investigated in the same way

(Packer & Addison, 1989:277). It is therefore imperative that clarity is sought in terms of the epistemological and ontological foundations of this study.

We are reminded that experiential learning, action learning and activity theory all subscribe to a core assumption that human activity forms human existence and therefore contextually embedded activity becomes the unit of analysis in human inquiry (Gilbert, 1997). Another common thread is the claim that learners construct knowledge and that knowledge is not passively received either through the senses or by way of communication, but is actively built up by the cognizing subject (Bodner, 1986:873). This more socially constructed form of knowledge is in contrast with the traditional or positivistic view of knowledge held by many psychologists and educators; therefore the nature of knowledge needs to be further clarified.

5.3 The nature of knowledge and other concepts relating to constructivist inquiry

5.3.1 The nature of knowledge

Kolb (1984) strongly asserts that:
"... to understand learning we must understand the nature of knowledge and vice versa".

Behaviourist and cognitive learning theories have dominated education over the last century and consequently educators' view of knowledge. Epistemological assumptions or what an educator believes about the nature of knowledge is critical to teaching practice (Wortham, 2001:115). The dilemma facing educators is that in any period of 30 years of teaching the currency of knowledge may change, often leaving educators feeling 'short-changed'. Wells (1999:57) uses Wartofsky's (1979) argument that "...what we take knowledge to be is itself the subject of an historical evolution".

Wells (1999:57) points out that as we look at what is currently the most valued form of knowledge, we may easily be misled into thinking that knowledge is essentially abstract in nature and largely unrelated to the business of everyday living. However, Wells

(1999:58) quotes Oatley (1996) who claims that when we take a historical perspective, by contrast, it becomes apparent that, in its origins, knowledge is intimately bound up with activity and is essentially social in nature. Wells (1999:53) makes a further point by raising an objection to the notion held in schools that individual intellectual development is largely a matter of accumulating a store of general knowledge through the process of reception (transmission) and memorization.

In rejecting this view Wells (1999:89) proposes an alternative conception in which it is the activity of 'knowing' that is given primacy. Wells argues that knowledge does not have an independent existence, but is simply a way of referring to what is focused on in communities in which the participants, whether co-present or temporarily alone, attempt to achieve greater understanding of some aspect of an activity in which they are jointly engaged. He continues by saying that it is certainly the case that materials and symbolic artifacts are involved in knowing, both as mediating tools and as outcomes of the activity, but these artifacts are not in themselves knowledge, nor do they contain knowledge in any metaphorical sense. Wells concludes that knowledge is not an object of any kind – material, mental or immaterial – that exists outside particular situations of knowing; and in such situations it does not preexist the activity but is what is recreated, modified and extended in and through collaborative knowledge building and individual understanding.

Indeed, this is a key theme in cultural-historical theory, where it is proposed that it is essentially in object-orientated joint activity that humans construct their knowledge of the world and, furthermore, that the value of this knowledge is that it serves to mediate their further collective activity (Leont'ev, 1981:64).

The early cognitivist approach tended to exclude societal and cultural factors from its notion of context and located knowledge in the individual (Daniels, 2001:69). The concept of cognition as a phenomenon that extends beyond the individual and that arises in shared activity, owes a clear debt to the original Vygotskian understanding that the inter-personal precedes the intra-personal (Daniels, 2001:70). This was the basis for Vygotsky's (1978) 'general genetic law of genetic development':

> Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first between people (interpsychological), and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relations between human individuals. (Vygotsky, 1978:61)

The striking fact here is that the traditional study of cognitive processes, cognitive development and formation of educational skills have been possessed and reside in the heads of individuals; social, cultural and technical factors have been relegated to the role of backdrops or external sources of stimulation (Salomon, 1997:xii). Salomon (1997:xiii) continues by saying that this notion is acceptable in isolation but when real-life problem solving situations arise then a different phenomenon emerges. He claims that people appear to think in conjunction or partnership with others and with the help of culturally provided tools and implements. The thinking of these individuals might be considered to entail not just "solo" cognitive activities but also distributed ones (Salomon, 1997:xv). Pea (1997:47) reminds us that Gregory Bateson once remarked that memory is half in the head and half in the world.

This perspective or epistemological view ties in very neatly with the view to knowledge held by the experiential theory of learning mentioned in chapter three, which is claimed to be the theory that underpins adventure-based or outdoor education. These theories proceed from the assumption that ideas are not fixed or immutable but are formed and reformed through experience (Kolb,1984:26). Chapter three provides a review of these theories and their relevance to this study.

5.3.2 The concept of distributed cognition

The concept of cognition as a phenomenon that extends beyond the individual, and that arises in shared activity owes its origin to the Vygotskian understanding that the interpersonal precedes the intra-personal (Daniels, 2001:70). Because of the influence of Vygotskian thinking in this research, the idea of distributed cognition needs to be addressed.

The concept of distributed cognition according to Cole & Engeström (1997:2) is not necessarily a new idea and they point out that its origins could be found amongst psychologists at the turn of the century. They point to Wihelm Wundt and Hugo Munsterberg to support this notion. Cole & Engeström (1997:3) quote Wundt (1921) saying that; "... individual consciousness is wholly incapable of giving us a history of the development of human thought, for it is conditioned by an earlier history concerning which it cannot of itself give us any knowledge". In modern terms, Wundt was arguing that while elementary psychological functions may be considered to occur "in the head", higher psychological functions require additional cognitive resources that are to be found in the socio-cultural milieu (Cole & Engeström, 1997:2-3).

Salomon (1997:xiv) maintains that perceptions are changing and quotes Resnick (1991) as saying that with the growing acceptance of a constructivist view of human cognitions comes a serious examination of the possibility that cognitions are situated and distributed rather than decontextualised tools and products of mind. Resnick (1991) continues to say that accompanying this possibility is the acknowledgement not only that social and other situational factors have a strong impact on "in-the-head" cognitions but that social processes should be treated as cognitions (cited in Salomon, 1997:xiv). For example, one could argue that all knowledge for adventure-based activities is generic and that the tacit knowledge gained through rock-climbing will be transferable to abseiling. But this may not occur unless the actual action is embedded in a culture of these activities. Does this imply that learners who are not regularly exposed to (in a culture of) certain activities and their artifacts will be unable or less likely to learn the activity effectively?

Cole & Engeström (1997:15) mention that anthropologists have made a major contribution to our understanding of both the universal process of culturally mediated cognition and the various ways in which heterogeneity of culture supports and requires the distribution of cognition. The notion that mediation of activity through artifacts implies a distribution of cognition among individual, mediator and environment, as well as the fundamental change wrought by artifact-mediated activity can be attributed to anthropologists (Cole & Engeström, 1997:13). They go further by quoting Fussell &

Krauss (1989) in saying that a distributed notion of culture also requires one to think about how cognition is distributed among people by virtue of their social roles.

Pea (1997:50) talks about the distribution of intelligence and its manifestation in activity. The primary sense of distributed intelligence arises from people in action. We begin with activity, expressing action rather than a state of being. In such activity, we see the configuring of intelligence. Activity is enabled by intelligence, but not only intelligence contributed by the individual agent. When intelligence (cognition) is said to be distributed it is meant that the resources that shape and enable activity are distributed in configuration across people, environments and situations. In other words, intelligence is accomplished rather that possessed (Pea 1997:50).

Salomon on the other hand (1997:xx) refers to some of Nickerson's (1997) common sense questions relating to the notion of distributed cognitions and then points out the dangers of creating a reverse dichotomy whereby distributed cognition becomes the focus to the exclusion of individual cognition. Salomon (1997) also offers a cautionary note in that while the idea of distributed cognition is novel and provocative, it can be carried too far. He expresses the concern that the new look, in its emphasis on situational, social and cultural variables, has gone to the extreme of removing the individual from the picture altogether. Salomon (1997:113) goes on to make a case for viewing individual and distributed cognitions as interacting and mutually supportive aspects of cognitive performance and learning, and argues that neither aspect can be understood without consideration of how it relates to the other.

This study then locates its ontology in the cognitive domain of psychology and its mode of learning and epistemology is strongly framed within the socio-constructivist orientation of Vygotsky, but with strong consideration of the importance of both individual as well as distributed cognition in thinking and consequently in the learning process of activities. The analysis of the activities to be considered is grounded in Engeström's model of activity theory, i.e. activity systems. According to Engeström (1999:46) thinking is not only distributed socially between participants of a collective,

and instrumentally between humans and their artifacts, but is also distributed temporally in time and is therefore historically bound. The study of Engeström's model (chapters seven to twelve) will reveal the decisive feature of multiple mediations in activity.

5.3.3 Mediated action

Wertsch (1995a) maintains that one of the fundamental claims of sociocultural research is that its proper focus is human action. Action may be external as well as internal, and may be carried out by groups, both small and large, or by individuals. Wertsch (1985, 1991) has also argued that "mediated action" is the appropriate unit of analysis for a Vygotskian derived socio-cultural approach (Wertsch, 1995a:16). He also makes an important point in that an assumption of socio-cultural research is that humans have access to the world only indirectly, or mediately, rather than directly or immediately.

Wertsch (1993:28) claims that according to Vygotsky (1978) higher mental functioning and human action are mediated by 'tools' and 'signs'. Vygotsky's interest, according to Wells (1999), was in the transforming effect of introducing tools into the relationship between humans and their environment, and in particular, in the effect of signs used as psychological tools to mediate mental activity.

Wells (1999:7) quotes Vygotsky (1981): "By including the psychological tool into the process of behavior the psychological tool alters the entire flow and structure of mental functions. It does this by determining the structure of a new instrumental act, just as a technical tool alters the process of a natural adaptation by determining the form of labor operations." Vygotsky identified a variety of sign-based tools that function in this way – various systems for counting, mnemonic techniques, works of art – but the one of greatest significance – the tool of tools – was language. For language not only functions as a mediator of social activity, by enabling participants to plan, coordinate and review actions through external speech; it also functions as a medium in which those activities are symbolically represented. Language also provides the tool that mediates the

associated mental activities in the internal discourse of inner speech (Vygotsky, 1987, cited in Wells, 1999 p7).

Wertsch (1993:33) makes the point that mediation is an active process, while the cultural tools or artifacts involved in mediation certainly play an essential role in shaping action, they do not determine or cause action in some kind of static, mechanistic way. Cultural tools can have their impact only when individuals use them, therefore mediation is best thought of as a process involving the potential of cultural tools to shape action, on the one hand, and the unique use of these tools on the other.

According to Steiner & Souberman (1978) 'tools' are of a material nature and externally oriented, while 'signs' are of a psychological nature, internally oriented.

5.4 Activity theory

The theoretical framework for this study is based on socio-cultural theory and uses activity theory as the conceptual framework to guide the interpretation and analysis of data emerging from learners engaged in adventure-based activities. A conceptual framework allows the researcher to decide what the important features in a study are, which relationships are important, what data must be collected and how it will be analysed (Robson, 1993:38).

Activity theory challenges the very nature of the individualist or Cartesian notion of thinking. Vygotsky's (1978) revolutionary view on thinking supported by Bakhtin (1982) and Davydov (1991) look at a more socially organized and historically evolving view of activities in which thinking is embedded (Engeström, 2000:44). Engeström (2000) also makes the significant point that because thinking is originally and primarily embedded in collective activities, thinking itself has an interactive, dialogic or argumentative character. In line with the basic tenets of socio-cultural or cultural-historical activity theory Engeström proposes that thinking is embedded in object-orientated and artifact-mediated collective activities which evolve and change over time.

5.4.1 Origin of Activity Theory

Activity theory (also known as socio-cultural, socio-historical or cultural-historical theory) is a product of Russian psychology. It proposes that the unit of analysis in human inquiry should be activity, which is seen as being the interface between the individual and his/her environment (Wertsch, 1993:8). This stance has been the solution to the ongoing crisis in psychology, that of the individual/society dualism. Many theorists have developed activity theory to what it has become today (Gilbert, 1997:6).

Their theories on activity have formed the basis for further elaboration by contemporary academics such as Engeström, Wertsch and Cole. Engeström focuses on the activity system as the unit of analysis, Wertsch on activity as the interface between the individual and society, and Cole on cultural psychology and activity. Although seemingly different, all socio-historical or socio-cultural theory share some core assumptions, the most fundamental one being that human activity forms human existence (Gilbert, 1997:6).

As opposed to a phenomenological social theory approach where context is seen as the world constructed through social interaction, theories pertaining to activity theory view context as being historically constituted between persons engaged in socio-culturally constructed activity and the world with which they are engaged (Chaiklin & Lave, 1993: 33).

One of the fundamental claims of socio-cultural research is that its proper focus is on human action; the goal therefore of a socio-cultural approach is to explicate the relationships between human action, on the one hand, and the cultural, institutional, and historical situations in which this action occurs, on the other (Wertsch, 1995a:67).

Leont'ev's work on activity involves an elaboration of the notions of object and goal and the centrality of the object to an analysis of motivation and the main thing according to Leont'ev (1978) that distinguishes one activity from another is the difference of their

objects. Leont'ev illustrates his proposed structure of activity through the following example:

> When members of a tribe are hunting, they individually have separate goals and they are in charge of diverse actions. Some are frightening a herd of animals towards other hunters who kill the game, and other members have other tasks. These actions have immediate goals, but the real motive is beyond hunting. Together these people aim at obtaining food and clothing – at staying alive. To understand why separate actions are meaningful one needs to understand the motive behind the whole activity. Activity is guided by motive. (Leont'ev, 1978:62)

5.4.2 The influence of Vygotsky and the significance of history

Wertsch (1995:6) points out that Vygotsky seldom if ever used the term "socio-cultural", instead he and his followers used "socio-historical", but Wertsch (1995:6) justifies the use of the term "socio-cultural" by reasoning that it is appropriately used in how culture is understood by the various parties involved (in the West).

Russian psychologist, Lev Vygotsky's idea on activity was influenced by the writings of Marx, Engels and Dewey. Gilbert (1997) points out that activity theory is the accepted label given to theory and research generated from the socio-historical school of Russian psychology founded by L.S. Vygotsky, A.N. Leont'ev and A.R. Luria during the 1920s and 1930s.

Gilbert (1997) explains that Vygotsky established activity as the interface between the individual and the environment, and overcame this duality crisis in psychology at the time by identifying two processes involved in human development. Firstly, there is the basic biological process of development and secondly the development of higher psychological functions which he believed were not solely physiological operations of the brain or mere reflections of society. Instead they were perceived to be of socio-cultural or socio-historical origin (Vygotsky, 1978:64).

Tudge (1995:pp.155-158) points out that Vygotsky (1978) illustrates this in internalization. A child (or person) initially learns things through participating in activity with others, the activity is then internalized which means that the external activity is

reconstructed internally (from interpersonal to intrapersonal). This is how the human consciousness is developed. But not just any activity is internalized. Activities that the child initially engages in with others is mediated by tools and signs (Vygotsky, 1978). Tools are of a material nature and externally oriented, while signs are of a psychological nature, internally oriented (John-Steiner & Souberman, 1978). These tools and signs are historically influenced and culturally defined and are fundamental to human action. Therefore, human action can be characterized as mediated action (Vygotsky, 1978). Human consciousness is culturally mediated as the action internalised is historically and culturally formed (Gilbert, 1997). Instead of seeing development as a linear cause and effect relationship (a more positivist view), Vygotsky according to Stenhouse (1983) saw it as a complex dialectical relationship between the individual and the environment, which is more representative of a circular process (Stenhouse, 1983,pp.36-44).

It must, however, be remembered as Wertsch (1995) points out, that even though Vygotsky did not explicitly formulate his ideas in terms of a theory of activity, his analyses of mental functioning, semiotic mediation, and other issues consistently focus on processes that have most if not all of the attributes of what later came to be called action by Leont'ev and others. Leont'ev's (1981) theory of activity and Vygotsky's notion of activity, as well as his ideas of mediated action and the Zone of Proximal Development (ZPD), have been developed further by a number of psychologists. This research study will be underpinned by Vygotsky's concept of mediated action and the ZPD, and then will use Yrjo Engeström's activity system as the analytical tool for the analysis of the effects of adventure-based activities in mediating learning.

Engeström (1993,pp.65-68) has introduced the activity system as a dynamic unit of analysis to study the elements of human activity. For Engeström, activity is a collective, systematic formation that has a complex mediational structure. An activity system produces actions and is realized by means of actions. However, activity is not reducible to actions. Actions are relatively short-lived and have a temporally clear-cut beginning and end. Activity systems evolve over lengthy periods of socio-historical time, often taking the form of institutions and organizations (Daniels, 2001:86). Cole & Engeström

(1G997:45) see activity as a collective, systematic formation that has a complex mediational structure and argues that activities are not short-lived events or actions that have a clear-cut beginning and end. They are systems that produce events and actions and evolve over lengthy periods of socio-historical time.

5.4.2 The first generation of activity theory

The first generation of activity theory is developed from Vygotsky's concept of "artifact-mediated and object orientated action" (Vygotsky, 1978:40). Vygotsky created the idea of mediation where an individual interacts with his or her environment through the use of material or mental tools (see 5.3.3). Vygotsky's view of human action is represented in Figure 5(a) below. The first generation activity model, as illustrated below, draws heavily on Vygotsky's (1978:40) concept of mediated action. During this period, studies tended to focus on individuals where development is seen as the internalization of external activities.

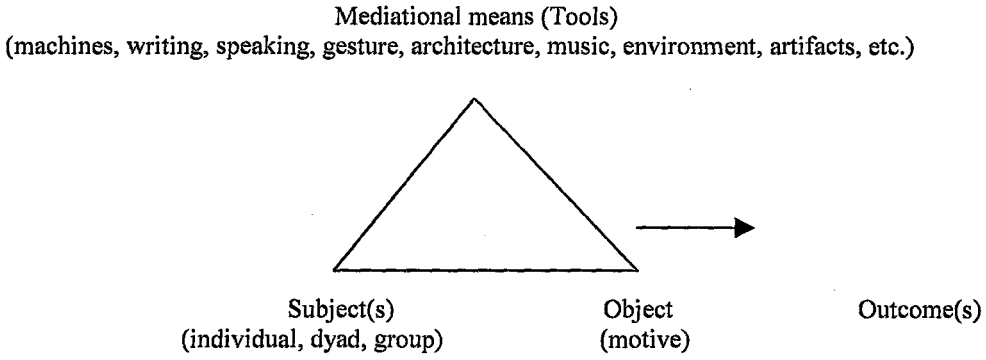


Figure 5(a). Human action as a tripartite structure

The ***subject*** may be an individual or group of individuals engaged in the action. The ***object*** is the objective or the motive, which is determined by the **subject** and may be a physical or conceptual product and may have to work through more than one object to reach the outcome. The ***mediation*** comes about as the individual uses different mediational means or 'tools' to reach the ***object*** of the activity. The process of ***mediation***

is an active process since the use of the 'tools' not only becomes a means of mediating the action in order to achieve the ***object***, but also influences the nature and mental functioning of the ***subject.*** The 'tools' in turn are also created and transformed during the action and reflect a cultural-historical aspect of social knowledge. Wertsch, del Rio and Alverez (1995:25) argue that:

> ...cultural tools usually emerge for reasons other than to facilitate the kinds of action they in fact end up shaping... the implicit assumption is often made that cultural tools such a language somehow emerged in the service of the forms of mental functioning they mediate. However, this is seldom the normal course of events. Instead, mediational means often emerge in response to a host of forces typically unrelated to the form of mental functioning at issue. Then these means are incorporated into action in unanticipated ways. The implication of such a claim, of course, is that human action, including mental functioning, is shaped by forces that have little to do with an ideal design. (Wertsch, del Rio & Alverez, 1995:25)

Since Vygotsky's work was object-orientated action mediated by cultural 'tools', it did not take into account the part played by the social interaction of other human beings. Another shortcoming of Vygotsky's model, which was developed by Leont'ev (1978), was the distinction between the concepts of 'activity' and 'action' (Daniels, 2001:86). Daniels (2001) explains that for Engeström an activity is a collective, systematic formation that has a complex mediational structure. An activity system produces actions and is realized by means of actions but activity is not reducible to actions. According to Engeström, activity systems evolve over lengthy periods of socio-historical time but actions are short lived with a clear cut beginning and end. The main element that distinguishes one activity from another is the difference of their object (motive) but action is driven by a conscious goal (Daniels, 2001:86). Leont'ev (1972) (as cited in Daniels, 2001:87) explains this:

> Apart from its (the action's) intentional aspects (what must be done) the action has its operational aspect (how it must be done), which is defined not by the goal itself, but by the objective circumstances under which it is carried out ... I shall label the means by which an action is carried out its operations. (Leon'ev 1972:63)

Leont'ev illustrates his notion of activity through an example of hunting (see, p.78): and makes the point that activity is driven or guided by motive but is not clear on the mobility of motive, i.e. that different actions may have different learning possibilities within the

overall system of activity. The second generation of activity theory addresses these shortcomings.

5.4.2 The second generation of activity theory

The second generation activity model is characterized by the division between individual and collective activity and the addition of the elements of community, rules and division of labour whilst emphasizing the importance of analyzing their interactions. This is a three-level model which distinguishes between activity, action and operation. The importance of this second generation of activity theory was that it brought interrelations between the individual subject and his or her community into focus (Daniels, 2001: 89).

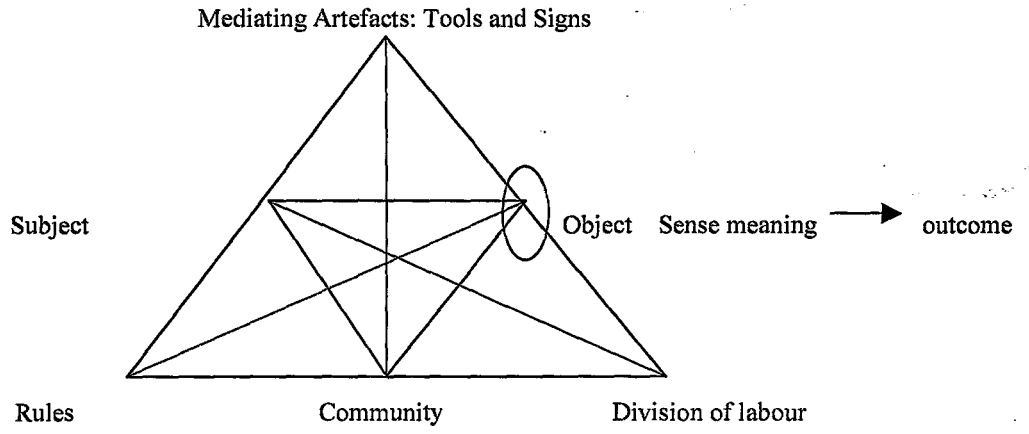


Figure 5(b). Second generation activity theory model

In Figure 5(b) above the object is depicted with an oval, indicating that object-orientated actions are always, explicitly or implicitly, characterized by ambiguity, surprise, interpretation, sense making and potential for change (Engeström, 1999 as cited in Daniels, 2001:89).

Engeström (1987:78) developed and modified Leont'ev's model of activity and presented a model of collective activity systems in a third generation of activity theory.

5.4.5 The third generation of activity theory

The third and current generation is characterized by Engeström's model of interacting activity systems. Activity is achieved through constant negotiation, orchestration and struggle between the different goals and perspectives of its participants. The objective and motive of a collective activity are something like a constantly evolving mosaic, a pattern that is never fully completed (Engeström, 1999, cited in Daniels, 2001:91).

The activity system represents "culturally situated and linguistically and technologically mediated" activities that are "enacted in communities and involve a division of labour" (Daniels, 2001:91).

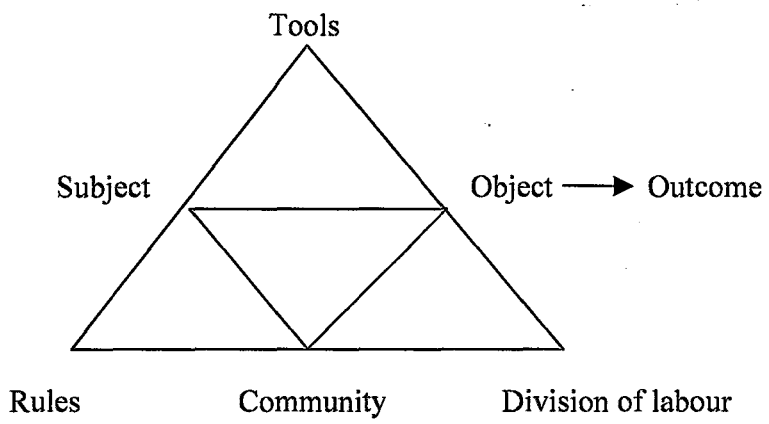


Figure 5(c). The relationship between the elements in an Activity System.

The Centre for Activity Theory and Developmental Work Research (1998:unpaged) defines the 'elements' in Engeström's Activity System as follows:

- The **subject** refers to the individual or group whose agency is chosen as the point of view in the analysis.
- The **object** refers to the 'raw material' or 'problem space' at which the activity is directed and which is molded and transformed onto outcomes with the help of physical and symbolic, external and internal mediating instruments, including both

tools and signs. An activity may well progress through more than one object in order to achieve the outcome successfully.

- The **community** comprises multiple individuals and/or sub-groups who share the same general object and who construct themselves from other communities.
- The **division of labour** refers to both the horizontal divisions of tasks between the members of the community and the vertical division of power and status.
- The **rules** refer to the explicit and implicit regulations, norms and conventions that constrain actions and interactions within the activity system.
- Engeström's consideration of the mediating role of artifacts allowed him to use the Vygotskian idea of **tools and signs. Tools** refer to artifacts used in the activity and **signs** are the psychological aspects like language, fear, self-esteem, confidence, and in this study the meta-cognitive strategies (MCS), etc.

Engeström (1999) sees joint activity or practice as the unit of analysis for activity theory, not individual activity. He is interested in the process of social transformation and includes the structure of the social world in analysis, taking into account the conflicts that occur in social practice.

This third generation model as proposed by Engeström intends to develop conceptual tools to understand dialogues, multiple perspectives and networks of interacting systems (Daniels, 2001:91). Activity theory according to Gilbert (1997:2) is a meta-theory with a framework that can be adapted to different contexts by virtue of its focus on socio-cultural-historical context. It has a moveable ontology. Gilbert continues by asking if reality is what happens when people interact with the environment, it is not a static entity but a changeable (malleable) thing. The distinction between the theory and the practice cannot be made, as the theory only becomes theory in its practice (Gilbert, 1997:2).

Daniels (2001:91) posits out the idea of networks of activity within which contradictions and struggles take place in the definition of the motive and object of the activity, this calls for an analysis of power and control within developing activity systems. Figure 5(d)

below shows two systems exhibiting patterns of contradiction and tension resulting in more than one object in order to get to the intended outcome.

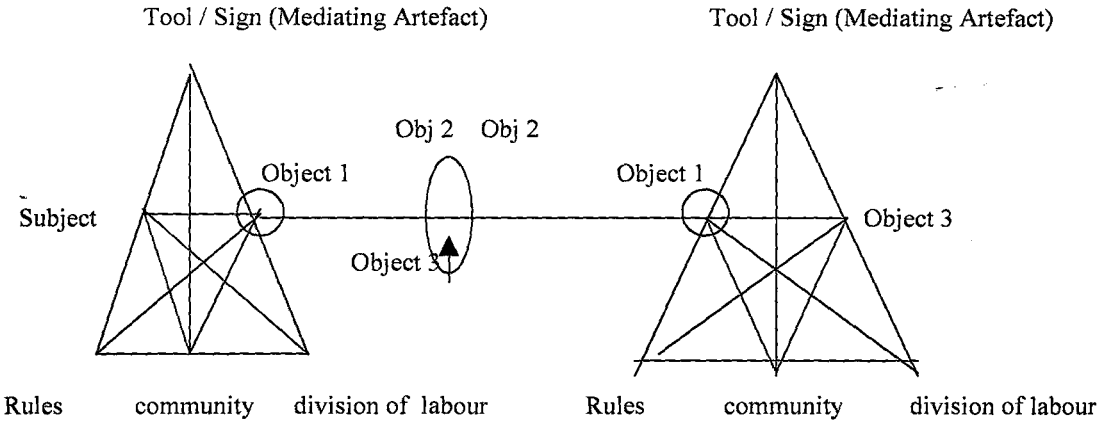


Figure 5(d). Engeström's Third generation Activity System Model: Two interacting activity systems as a minimal model for third generation activity theory

What follows is a synopsis of characteristics that Engeström (1993) makes regarding Activity Systems:

- An activity system gives context and meaning to seemingly random individual events and it enables its components to be understood historically.
- Contexts are activity systems and they integrate the subject, object and the instruments (material tools as well as signs and symbols) into a unified whole.
- An activity system incorporates both the object-oriented productive aspect and the person oriented communicative aspect of the human conduct.
- A human activity system always contains the subsystems of production, distribution, exchange and consumption.
- Between the components of an activity system, continuous construction is going on but the life of activity systems is also discontinuous.
- Besides accumulation and incremental change there is crisis, upheavals and qualitative transformations.

- It is not a homogeneous entity, it is composed of a multitude of disparate elements, voices and viewpoints.
- This multiplicity can be understood in terms of historical layers.
- An activity system always contains sediments of earlier historic modes, as well as buds or shoots of its possible future.
- These sediments and buds are found in different components of the activity system, including the physical tools and mental models of the subjects.

Finally Engeström (1999) argues that research has a dialectical, dialogic relationship with activity and he focuses on contradictions as causative and disturbances as indicators of potential. He sees interventions as enabling the construction of new instrumentalities, and the bringing about through externalization the transformative construction of new instruments and forms of activity at collective and individual levels (Engeström, 1999:11). Engeström suggests that activity theory may be summarized with the help of five principles which Daniels (2001) claims stand as a manifesto of the current state of activity theory:

The ***first principle*** is that a collective, artifact-mediated and object-orientated activity system, seen in its network relations to other activity systems, is taken as the prime unit of analysis. Goal directed individual and group actions, as well as automatic operations, are relatively independent but subordinate units, eventually understandable only when interpreted against the background of entire activity systems. Activity systems realize and reproduce themselves by generating actions and operations.

The ***second principle*** is the multi-voicedness of activity systems. An activity system is always a community of multiple points of view, traditions and interests. The division of labour in an activity creates different positions for the participants, the participants carry their own diverse histories, and the activity itself carries multiple layers and strands of history engraved in its artifacts, rules and conventions. It is a source of trouble and a source of innovation, demanding actions of translation and negotiation.

The ***third principle*** is historicity. Activity systems take shape and get transformed over lengthy periods of time. Their problems and potentials can only be understood against their own history. History itself needs to be studied as both local history of the activity and its objects, and as history of the theoretical ideas and tools that have shaped the activity. Thus, medical work needs to be analyzed against the history of its local organization and against the more global history of the medical concepts, procedures and tools employed and accumulated in the local activity.

The ***fourth principle*** is the central role of contradictions as sources of change and development. Contradictions are not the same as problems or conflicts. Contradictions are historically accumulating structural tensions within and between activity systems. The primary contradiction of activities in capitalism is that between the use value and exchange value of commodities. This **primary contradiction** pervades all elements of our activity systems. Activities are open systems. When an activity system adopts a new element from the outside (for example, a new technology or a new object), it often leads to an aggravated **secondary contradiction** where some old element (for example, the rules or the division of labor) collides with the new one. Such contradictions generate disturbances and conflicts, but also innovate attempts to change the activity.

The ***fifth principle*** proclaims the possibility of expansive transformations in activity systems. Activity systems move through relatively long cycles of qualitative transformations. As the contradictions of an activity system are aggravated, some individual participants begin to question and deviate from its established norms. In some cases, this escalates into collaborative envisioning and a deliberate collective change effort. An expansive transformation is accomplished when the object and motive of the activity are reconceptualized to embrace a radically wider horizon of possibilities than in the previous mode of activity. A full cycle of expansive transformation may be understood as a collective journey through the zone of proximal development of the activity.

The critical factors that emerge from these principles have a profound influence on learning and consequently on the interpretation of the evidence generated by this research:

- mediated action (see 5.3.3)
- language and multi-voicedness in social activity (see 5.5)
- the role of history and distributed cognition in activity systems (see 5.3.2)
- contradictions, innovate learning and change (see 5.9)
- the Zone of Proximal Development (ZPD) (see 5.6)
- and the expansive transformational learning cycle (see 5.9).

5.5 Language in social activity

Implicit in all of these principles is the element of learning and its underlying ontology, evident in behaviour such as innovation, negotiation and change. Learning is hugely influenced by language in the context of any activity. Gordon Wells (1999:3-49) in his writings on Halliday quotes Halliday (1993) as saying that the distinctive characteristic of human learning is that it is a process of making meaning – a semiotic process; and the prototypical form of human semiotics is language. Hence the ontogenesis of language is at the same time the ontogenesis of learning. Wells (1999:6) says that for both Vygotsky and Halliday, then, language is a human "invention" that is used as a means of achieving the goals of social living. Vygotsky regarded language as the "tool of tools" and it did more than mediate social activity but enabled planning, co-ordinating and reviewing of actions through external speech. In addition, as a medium in which those activities are symbolically represented, it also provides the tool that mediates the associated mental activities in the internal discourse of inner speech, hence it may be regarded as a semiotic tool. Vygotsky regarded highly the importance of inner speech that accompanied problem-solving activities of various kinds (Wells, 1999:7). Engeström (2000:308) cites Billig (1988) in making the point that multivoicedness is not only a characteristic of communities, it is inherent in the speech, thought and action of every individual and becomes manifest in dilemmatic situations of trouble, conflict and disturbance.

Wells (1999:8) again uses Halliday (1978) to point out the significance of the co-construction of meaning in particular conversations providing the basis for the child's taking over of adult language. This means, according to Halliday (1978), that in the development of a child as a social being, language has a central role. Language is their main channel through which the patterns of living are transmitted to them, through which they learn to act as a member of a 'society' – in and through the various social groups, the family, the neighbourhood, and so on and to adopt the 'culture', its modes of thought and action, its beliefs and its values.

The child learns from his mother tongue in behavioural settings where the norms of the culture are acted out and enunciated for him, settings of parental control, instruction, personal interaction and the like; and reciprocally, he is 'socialized' into the value systems and behaviour patterns of the culture through the use of language at the same time as he is learning it (Halliday, 1978, cited in Wells 1999:24). The use of culturally specific language during adventure-based learning experiences enables the conceptual, perceptual and practical mediation of the required learning to happen. This in a sense then brings us to a significant aspect of Vygotsky's thinking and his focus on "the social situation of development" (Wells, 1999:24), that is the Zone of Proximal Development (ZPD).

5.6 The Zone of Proximal Development (ZPD)

The concept of the ZPD was created by Vygotsky as a metaphor to assist in explaining the way in which social and participatory learning takes place (Daniels, 2001:56). Schunk (2000:243) defines the ZPD as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers."

Vygotsky developed the concept of the ZPD to account for the role of teaching in the process of learning. Wells (1999) makes the point that the ZPD should be treated as a

general developmental law and even be applied to adult learning, but needs to be seen in the light of Vygotsky's overall theory or else it may well be confused with any instructional technique where an adult simply leads a child through developmental steps. The difference for Vygotsky was that the *context* in which the interaction occurs is of crucial importance (Wells, 1999:25). Collaboration with another person, either adult or a more competent peer, in the zone of proximal development thus leads to development in culturally appropriate ways (Wells, 1999:25).

Wells (1999:25) also points out that a significant feature of the ZPD is that it makes clear that the ZPD is not an attribute of the individual learner but rather a potential for his or her intra-mental development that is created by the inner-mental interaction that occurs as the learner and other people cooperate in some activity. Wells also points out that Vygotsky emphasized certain criteria: firstly that the assistance enables the learner to achieve, in collaboration with another, what he or she is as yet not able to achieve alone. Secondly, that assistance should be relevant to the learner's own purposes and relevant to life for the learner.

5.7 Activity Theory in context

The following two examples of a learner engaged in adventure-based activities at Lilyfontein School may be useful at this point in order to illustrate how Engeström's elements of the activity triangle relate to an adventure activity.

5.7.1 Example one: rock climbing

All the elements of the activity system will collaboratively influence the outcome of an activity. This can be seen in the example of rock climbing action below.

The learner (***subject***; the climber) is motivated towards a solution (***object***: climbing to the top of the structure). The ***outcome*** may be for the learner to develop self-confidence, complete the task, overcome fears, plan, set goals, reflect and self-evaluate on the route he/she ought to climb (self-regulated learning strategies). This effort is mediated by ***tools***

(artifacts at the learner's disposal: ropes, harness, surface of the cliff, etc.) and ***signs*** (psychological aspects like language, use of voice, attitude, and meta-cognitive aspects like fear of heights, self-esteem, prior-experiences, problem solving abilities, trust, etc.). This is done in collaboration with others. The ***community*** may consist of, amongst others, the instructor, peers, friends, belay partner (on required safety rope), the school and indirectly parents. The structure of the activity is constrained by cultural factors like conventions (***rules***: hand positions, body position, talking, concentration, listening to instructions, use of correct techniques, tying of knots, safety rules, etc.) and the ***division of labour*** (which climbers are working with each other, relationship with partner, who the instructor is (feelings of trust), previous relationship with instructor (power issues), how good the belay person (person on safety ropes) is, how the outcome is measured and what feedback mechanism is used to convey feedback to the learner, is the performance being assessed as part of the Life Orientation learning area, will all influence the outcome or objective in one way or another.)

5.7.2 Example two: canoeing

The ***subject*** is the learner wanting to learn how to canoe and therefore must have an ***objective*** to become a proficient canoeist. He may not have succeeded in other sports so is determined to achieve some recognition. This experience or activity is mediated by ***tools*** of the activity like the canoe, the water, paddles, clothing and ***signs*** like language, voice and instruction as well as aspects like attitude to water (fears) effecting self-confidence, ability to balance, feelings of achievement and failure (these are culturally and historically determined through life experience and learning).

The activity is bound by conventions or ***rules***, which are also culturally determined through the collective gathering of information and experience over time, which has been documented by people, perhaps called experts. Such conventions in canoeing may be related to the fitness of the individual, body position in a canoe, how to grip the paddle effectively, body forces, balance, safety, etc. The people involved would be the ***community*** and may well involve instructors, peers, canoeing partners, teachers, parents,

onlookers, people in the cultural setting that have set up rules, conventions, techniques, approaches, etc. The ***division of labour*** may involve whoever looks after the canoe or paddles, who carries the canoe, who organizes the food or water, who sits in the front or back of the canoe, peer pressure and pecking order, etc.

In each of these "settings" meta-cognitive actions like thinking about action, remembering, problem solving and decision making are distributed not only among artifacts (ropes, canoes, water, harnesses) but among the rules (no standing up in a canoe) and among people according to the division of labour (instructors, leaders, parents, peers) (Engeström & Cole, 1997:17). Learning happens through more competent people leading less competent people by using artifacts, conventions, rules, skills or techniques in adventure-based activities. This is essentially learning through the ZPD (Vygotsky) as detailed on page 89.

5.8 Activity systems as a change process (expansive learning cycle)

These two simple examples serve to illustrate activity theory in terms of an activity system in practical terms. More detailed analysis will be given when other adventure-based activities are interpreted as part of chapters ten, eleven and twelve. These descriptions highlight the various elements of the activity system. It is, however, important to remember the *transformability* of an activity system and consequently the purpose of activity is to learn and to develop. In the case of this study adventure activities put learners into learning situations where they **encounter contradictions between elements of the activity system.** These contradictions lead to conflict or a situation of no progress. At this point a need arises to reflect on their performances (meta-cognition) with the view to change and improvement. The contradiction may furthermore require the participants to use the new artifacts, tools, signs, rules, community, in order to change existing practice. Changing existing practice may well improve learning in their immediate context and may later possibly transfer their learning into other contexts.

An activity system is, by its very nature, in a process of constant change and transformation and is not static. There is constant construction and renegotiation within the elements; activity theory allows for an understanding of change across time and place (Thomen, 2001:75). Thomen (2001) adds that as new subjects enter the activity system, tasks will be reassigned and re-divided, rules reinterpreted. As new tools become available, so the activity will change. It is this dynamic process of change that the third generation of activity theory attempts to capture, and that provides a valuable analytical tool in adventure-based learning experiences.

Any such transition or change might be characterized as an ***expansive cycle*** (Engeström, 1987, 1991,1997). An expansive cycle is a developmental process that involves both the internalization of a given culture of practice and the creation of novel artifacts and patterns of interaction (Cole & Engeström, 1997:40). Cole and Engeström represent cognition as the emergent new state of the subject's knowledge resulting from the analysis and synthesis of at least two sources of information in real time, the two being the object already held by the subject and the object represented through the medium. They posit an "expansive cycle" which represents a cyclical relationship between internalization and externalization within activity that is constantly changing. Their thinking reflects a cultural theory of mind in which cognition is redistributed and "thinking occurs as much among as within individuals" (Daniels, 2001:93).

Engeström (1997) elaborates on the expansive cycle in that:

> ... the new activity structure does not emerge out of the blue but that it requires reflective analysis of the existing activity structure – participants must learn to know and understand what they must learn to know and understand what they want to transcend. And the creation of a new activity system requires the reflective appropriation of advanced models and tools that offer different ways out of the internal contradictions. However, these forms of internalization are not enough for the emergence of a new structure. As the cycle advances, the actual design and implementation of a new model for the activity gain momentum. Externalization begins to dominate and the expansive cycle of an activity system begins with almost exclusive emphasis on internalization, on socializing and training novices to become competent members of the activity as it is routinely carried out. Engeström (1997:40)

Engeström (1997) emphasizes that at this point creative externalization occurs first in the form of discrete individual violations and innovations. As the disruptions and

contradictions in the activity become more demanding, internalization increasingly takes the form of critical self-reflection – and along with externalization (meta-cognitive strategies), – the search for novel solutions increases. Externalization reaches its peak when a new model for the activity is designed and implemented. As the new model stabilizes itself, internalization of its inherent ways and means again becomes the dominant form of learning and development. This change is often seen during the action taking place in the group dynamic tasks as learners reflect, replan and retry to accomplish success in a task.

Engeström (1997) also sees that, at the level of collective activity systems, such an expansive cycle can be viewed as the equivalent of traveling through Vygotsky's zone of proximal development (ZPD) at the level of individual and small-group learning. Engeström (1999:9) sees joint activity or practice as the unit of analysis for activity theory, not individual activity. He is interested in the process of social transformation and includes the structure of the social world in analysis, taking into account the conflictual nature of social practice. He continues by explaining that he sees instability (internal tensions) and contradiction as the "motive force of change and development" and the transitions and reorganizations within and between activity systems as part of evolution; it is not only the subject, but the environment, that is modified through mediated activity (Engeström, 1999:9).

Engeström's (1999) fourth principle, as depicted and claimed by Daniels (2001:94), is the central role of contradictions as the source of change and development. Daniels points out that contradictions are not the same as problems or conflicts but that contradictions are historically accumulating, and are the structural tensions within and between activity systems. There are constant contradictions within and between the elements of an activity system providing the opportunity for change and development and leading to continuous transitions and transformations between components of an activity system (Engeström, 1999:9).

Engeström (2000:305) points out that when an activity is disturbed or contradictions occur, one needs to focus on these contradictions and search for their origins in systemic causes since resolution may only come about when the system is changed. He argues that not all contradictions will be resolved but innovations may lead to the "cycle of expansive learning which may lead to a redefinition of the object of the activity", (2000:308).

5.9 The relevance of Activity Theory to this research

Activity theory in this research refers to Engeström's third generation activity theory and its relevance to this research is evident in five aspects.

Firstly, activity theory provides a useful conceptual framework for understanding how learners develop and use self-regulated learning techniques through engaging in adventure-based activities and in so doing become better at applying meta-cognitive techniques in order to be more effective self-regulated learners (see chapter four; p.61). Activity theory enables the understanding and analysis of these learning processes. The theory also shows how learners use meta-cognitive techniques during an activity as they encounter contradictions and furthermore the resultant change that learners undergo through reflecting on these contradictions between elements in an activity system. It is the interaction and collaborative effects between the elements that make overall changes to the system a meaningful learning experience.

Secondly, activity theory is an interpretive method to enable analysis of current institutional practice to determine the appropriate use of adventure activities as part of restructuring the Life Orientation curriculum into appropriate instructional programmes for delivery at Lilyfontein School. The National Life Orientation Curriculum (NCS) actually contains the meta-cognitive elements that this study identifies as strategies used during adventure-based activities to allow the subject to reach the object and deal with contradictions between the various elements in the activity system. This study claims that this interaction is developmental and mediates learners into becoming better self-

regulated learners and in so doing influences and changes instructional practice to add significant value to learning experiences.

Thirdly, activity theory also allows for multiple perspectives of reality and this allows for scope within which to construct interpretations of how different participants (stakeholders) value the experiences of the adventure-based activity phenomenon. It, at the same time, also allows for those people involved in this multi facetted phenomenon of adventure-based activities to interact, and to use voicedness to interpret and negotiate meaning in their real-life context of adventure activities. This encapsulates the socio-cultural and socio-historical ontology and epistemologies that support a constructivist approach to learning. This in turn reflects the interpretivist paradigm as well as the phenomenological leaning of this research approach.

Fourthly, activity theory provides a clear focus of the 'elements' of an activity: subject, object, tools, rules, community and division of labour. In particular the tool element of the activity theory triangle allows for the psychological aspect of meta-cognitive thinking to take place in the form of meta-cognitive strategies that can be used to improve and modify performance of an individual in coping with the challenge of contradictions and tensions. This facilitates the analysis of human action during the data collection phase of this study thereby enabling the interpretation of "...object orientated, collective and culturally mediated human activity" (Engeström, 1999:9). This then also incorporates psychological aspects like distributed cognition and language used between the various elements.

Finally, activity theory in this study allows for the identification of contradictions and tensions within and between the 'elements' (Thomen, 2001:77) in the Life Orientation curriculum, the nature of adventure-based activities, and the participants becoming self-regulated learners. The contradictions within the elements are, according to Engeström (1993a:72), 'primary contradictions' and reflect the contradiction between the elements and the 'object'. For example, the learners are required to abseil but the figure of eight

(abseiling equipment) is missing and therefore abseiling cannot occur resulting in a 'primary contradiction' within the 'tool' element in relation to the 'object'.

According to Engeström (1993a:72), when a strong novel factor or new element is "injected" into the system then 'secondary contradictions' or tensions appear between those elements or factors and other 'traditional' or old components of the system. For example, all the participants (learners at Lilyfontein School) have prepared for abseiling activities at a local well known site but a group of grade 11 learners were taken to abseil off the Madonna and Child waterfall at Hogsback (see pp). Observation of these learners showed clearly that this different site, surroundings (a change in their environment 'tool'), different instructors (community and division of labour), even different harness function (artifacts) set up contradictions within the learners' thinking. This change of elements in the system set up a *primary contradiction* **within** the 'tool' element in relation to the object but at the same time the rules at the new site changed. This change then set up a *secondary contradiction* **between** the 'rule' element and the 'tool' element. The learning that happens in this activity system through using meta-cognitive strategies (internalization) to find concrete solutions (externalization) to the disturbances created by contradictions is referred to by Engeström (2000:308) as the expansive learning cycle. This expansive learning cycle allows for the building of self-confidence in the learners in that they experience their expansion of learning in being able to apply some of the previously learned culturally specific techniques to the new situation. This is enabled through the use of meta-cognitive strategies.

The nature of adventure-based activities involve a great deal of emotive reactions like frustration, fear, excitement, disappointment, anxiety and anger therefore for the purpose of this research these "attitudinal, emotional and/or psychological" aspects are identified as part of the 'tool' element also referred to as the "mediating artifacts" by Cole & Engeström (1997:9). Cole & Engeström (1997:14) use White (1959:236) to express the relationship between artifacts:

> An axe has a subjective component; it would be meaningless without a concept and an attitude. On the other hand, a concept or attitude would be meaningless without

> overt expression, in behavior or speech (which is a form of behavior). Every cultural element, every cultural trait, therefore, has a subjective and an objective aspect. Cole & Engeström (1997:14)

These contradictions and tensions allow participants to reflect on their existing practice, identify the 'disparities' and find innovative solutions through renegotiation, reconstruction and change between the elements. This consequent change is a way of mediating learning towards acquiring meta-cognitive skills. Daniels (2001:100) points out that "... meta-cognitive mediation refers to children's acquisition of semiotic tools of self-regulation, self-monitoring, self-checking and self-evaluation."

5.10 Limitations of Activity Theory

Activity theory offers an alternative way of viewing human activity, thinking and knowledge which according to a socio-cultural paradigm is socially and contextually bound. Although this notion makes educational sense and supports the constructivist approach to learning, it poses challenges for researchers, particularly from a practical point of view.

Firstly, Engeström's model of activity theory posits six 'elements' in an activity system, namely, 'subject', 'object', 'tool', 'rule', 'community' and 'division of labour', but Engeström does not adequately place the emotional aspects of activity in any of these elements when the importance of these attitudinal, emotional or psychological aspects to change and development cannot be over emphasized. Thomen (2001:80) suggests that emotions should possibly form another element in an activity system. This would most probably add a considerable dimension for researchers when attempting to analyze individual's influences and interactional roles in social activity.

Secondly, activity theory highlights the transformative ability of an activity system by allowing for an understanding of change across time and place. It is through identifying contradictions between elements of the system and encouraging reflective thought by participants that change ought to occur. However, activity theory appears to assume that change will happen, and very little attention is given to conditions that may constrain the

participants' ability to change an activity system. Very little has been written about consequences emerging when change does not follow, and from an action research point of view what the procedure for further intervention will be in such situations. Engeström (2000:329) does, however, point out that activities do not have a clear cut beginning and end, and can evolve over lengthy periods of socio-historical time. This time factor may well be a constraint for innovative solutions to occur.

Thirdly, activity theory gives very little guidance to researchers attempting to make sense of and interpret data to provide rigorous enough evidence to conclusively substantiate changes that have to be made to a system. Considering that " a distributed notion of culture also requires one to think about how cognition is distributed among people by virtue of their social roles" (Cole & Engeström, 1997:15) and that "... culture can be seen as a set of control mechanisms – plans, recipes, rules, instructions for governing behavior" researchers will always be faced with their interpretations being highly specific and contextual with very little scope for transference into other contextual domains of research.

Fourthly, activity theorists provide very few practical guidelines in proposing analytical frameworks for capturing and gathering information from activity situations. This has been a problem in this study and the researcher has developed and used untested matrixes, tables, measuring tools and rubrics for this purpose.

Finally, in the researcher's view Engeström's model does not always provide clear reasons or explanations for the resolution of the contradiction that has occurred between elements. The researcher here has felt the need to explain more clearly what, in his opinion, it was that was helping the participant though the 'contradiction'. According to the researcher and the claims in this study, closer observation reveals that one is able to identify and judge the **meta-cognitive strategy** that is being employed by the participant in trying to resolve the problem or conflict that he/she has encountered. The researcher in this study attempts to identify the meta-cognitive elements used during an activity, measure their frequency of occurrence and then evaluate or judge their value to the

learning of life-skills. The meta-cognitive strategies (MCS) form part of the sign element as psychological aspects of Engeström's activity triangle.

5.11 Reflection on this chapter

According to the researcher's readings adventure-based activities appear to use experiential learning theory as their theoretical framework. Due to the limiting factors of experiential learning theory, which are mentioned in this chapter, the researcher has chosen to use Engestrom's Third Generation Activity Theory Model. This model uses tools, object, subject, rules, community and division of labour as defining elements to interpret action and consequent change as a result of contradictions between these elements. This is very helpful in making meaning of the learning that happens during adventure activities. Activity theory also takes into account the various elements that have a mediating influence on an activity system, e.g. language and dialogue, distributed cognition, Zone of Proximal Development, the processes of internalization and externalization, the people in the overall system, the attitudes that prevail during such an activity, etc.

Most activities are directed at the achievement of goals. Activity theory uses the term 'object' to refer to the goal at which an activity is directed and 'outcome' as the final achievement of the object. 'Subjects' involved in the activity do not necessarily share a common understanding of the goals. This, as Engeström (1987) says, may well lead to contradictions and consequent tensions. It is these contradictions and the resultant mediated learning which occurs through the 'tools', 'rules', 'community' or 'division of labour' that promotes change and movement forward of the individual and consequently the institution or system. Michael Cole (1985) reminds us that individuals and the social milieus of which they are a part constitute mutual interacting elements of a single system.

Because this research recognizes the dynamic and real nature of adventure-based activities, it identifies meta-cognitive strategies used by participants during these

activities. These meta-cognitive strategies are used within the framework of activity theory to get a sense of whether adventure-based activities enable self-regulated learning.

Chapter 6
The Methodological Framework

6.1 Introduction

This research is conducted within the interpretive paradigm. Chapter six presents significant features of the interpretive paradigm in order to support this position. Reference will also be made to the phenomenological perspective in order to highlight the significance of the participants' interpretations of their adventure-based experiences which is in keeping with any qualitative research approach. Aspects like research methods, generalizability, ethical considerations and trustworthiness relevant to this study are described.

The nature of this study is such that it is required to answer two salient questions, which in a sense are the primary and secondary goals of this study, these questions are:

i) Can a well structured adventure-based programme fulfil certain Learning Outcomes and requirements of the Life Orientation National Curriculum Statement? [this primary question /goal is given less focus in this study].

ii) Do learners who engage in adventure-based activities, as described in chapter two, use, develop and acquire meta-cognitive strategies which this study regards as vital components of self-regulated learning? [this secondary goal / question is the major focus of this study].

6.2 The interpretive paradigm

There are different research 'traditions' or 'paradigms' that are distinguishable by their contrasting ontological and epistemological assumptions. In this research the terms 'paradigm' and 'tradition' are used interchangeably. This research adopts Bassey's definition of the term 'paradigm' to mean:

> A network of coherent ideas about the nature of the world and the functions of researchers which, adhered to by a group of researchers, conditions the patterns of their thinking and underpin their research actions. (Bassey, 1995:12)

Epistemological and ontological assumptions are critical to formulating goals and guiding the research path in educational research. Wortham (2001:118) makes the point that beliefs about knowledge inform, justify and sustain our practices in education.

Researchers in the scientific tradition are concerned with human behaviour; interpretive researchers are concerned with human action. Interpretation is fundamentally a human activity (Murray 2003). The interpretive paradigm, also called the hermeneutic tradition, developed as a reaction against the scientific or positivist tradition. The positivist paradigm has been criticized for its technicist approach that aims to control and predict relationships and also of its view that knowledge is absolute. Packer & Addison (1989:15) continue by saying that the positivist's dualistic view of mind and world allowed them to claim that they had identified the source of genuine knowledge and that science provided a model for all analytical inquiry. This philosophical position was known as logical positivism and formed the bases of the traditional epistemology of science. In classical scientific method the facts are regarded as 'out there', independent of the observer, waiting to be discovered (Cannole, 1998:8). Researchers working within this paradigm have also been criticized for their singular view on reality that is measurable through 'objective' and 'value-free' scientific or quantitative methods. Packer & Addison (1989:18) further claim that this position is an abstraction that removes an utterance or action from its immediate context, from the particular circumstances of a human situation, and from individual interests and concerns.

The positivist position was seriously undermined by a number of thinkers; in particular Karl Popper's criticism of the process of inductive reasoning in science as well as his application of the principle of 'falsification' to testing theories in research (Flyvbjerg, (2001:81-84). The counter claim from the hermeneutical (also interpretivistic) stance was that action and context are not separable, performance and context cannot be teased apart. Packer & Addison (1989) clarify further the interpretivist's position in saying that:

> Interpretive inquiry focuses on human activity situated in context and the offspring of such activity: institutions, histories, accounts, records, texts, stories, lives. It

> makes no sense to imagine any of these existing in the absence of beings like ourselves, who wish to study them and, conversely, it would make no sense to think that we could exist, as psychologists and inquirers, apart from or independent of a whole range of practices, institutions, and accounts. People both constitute and are constituted by their social world; we contribute to sustaining it as what it is (or changing it); it made us what we become. We cannot become the neutral and dispassionate observers that both empiricism and rationalism would have us be. (Packer & Addison, 1989:20)

Researchers within the interpretive paradigm argue that human action is value laden and that human phenomena cannot be understood independent of human interests and activities (Packer & Addison, 1989:19). A researcher of human action must therefore focus on how people interact, negotiate and make meaning within social situations as the reciprocal nature of human action means that people are both built by and build their social world. Taylor & Bogdan (1984:9) view the task of the phenomenologist and qualitative methodologist as one of capturing the process of interpretation and seeing things from other people's point of view.

Researchers from the interpretive paradigm seek to understand phenomena and to interpret meaning within the social and cultural context of the natural setting (Cantrell, 1993:84). Humans, according to Murray (2003:5), also operate by means of shared systems of meaning expressed through language and other semiotic forms (i.e. systems of signs). Language and other symbols do not simply refer to objects but are constitutive of them, that is, they bring them into being, give them significance. In order to uncover what people believe and to render meaning about their actions and intentions, interpretive researchers interact dialogically with the participants (Cantrell, 1993:84). Cantrell (1993) argues that unlike positivists who attempt to separate values from facts, interpretivists accept the "inseparable bond between values and facts" and attempt to understand reality, especially the bahaviour of people within the social context.

Janse van Rensburg (1994:6) points out that within the interpretivist paradigm there are multiple perspectives of the world, reality is constructed by individual experiences and understanding which are "shaped by the interactions in the inquiry", and this requires multiple methods for understanding. Cannole (1998:14) supports this in that she argues that from an interpretivist perspective humans have reasons. This means that actions are

preceded by intentions which take place within a structure of social rules and therefore have meaning for both actor and observer. Meanings are also generated, shared and negotiated through language and/or other forms of symbolism.

Although the overall characteristic of this research is about activity it deals primarily with two concerns. Firstly it is concerned with what learning occurs when students engage in adventure-based activities and secondly how the institution (school) can best use the findings revealed by this study to change and consequently add value to the curriculum. In order to achieve these aims it is imperative that the ontological as well as the epistemological foundations of this study are clearly demarcated.

The underlying ontological assumptions of the interpretivist paradigm according to Cantrell (1993:83) are of multiple realities and are constructed in the mind through human interaction. Some cognitive learning theories like experiential learning, action learning theory and activity theory all subscribe to a core assumption that human activity forms human existence and therefore contextually embedded activity becomes the unit of analysis in human inquiry (Gilbert, 1999:7). Another common thread is that learning theorists claim that learners construct knowledge. Von Glaserfeld (1990) states that knowledge is not passively received either through the senses or by way of communication, but is actively built up by the cognizing subject (as cited in Bodner, 1986:873). Epistemological assumptions or what an educator believes about the nature of knowledge is critical to teaching practice. Wells (1999:57) points out that as we look at what is currently the most valued form of knowledge, we may easily be misled into thinking that knowledge is abstract in nature and largely unrelated to the business of everyday living. Wells (1999:57) in claiming this is a misconception quotes Oatley (1996) who says that when we take a historical perspective, by contrast, it becomes apparent that, in its origins, "... knowledge is intimately bound up with activity and is essentially social in nature".

As this research is within the interpretivist paradigm, it aims to understand the meaning learners attribute to adventure-based experiences. The making of meaning (learning) that

occurs through engaging in adventure-based activities is central to understanding how this learning experience helps mediate learners in becoming better self-regulated learners. This study also listens to how other stakeholders like parents and teachers interpret and value adventure-based activities as learning experiences. This study will also boldly attempt to make in-depth observations and analyses of learners in action during their engagement in adventure-based activities. All this information will serve to inform an overall research process that will influence decisions on curriculum content relating to the Learning Area, Life Orientation, as it is interpreted and offered at Lilyfontein School. Murray (2003:5) clarifies this position by saying that members of a community, through their actions and words, both construct and signify meaning, as does a researcher investigating that community. A phenomenologist views human behaviour, what people say and do, as a product of how they define their world (Taylor & Bogdan, 1984:8)

While the positivist paradigm remains the dominant one in education, the interpretive perspective has gained much wider acceptance. Cantrell (1993:87) claims that because of the complex nature of education – entangled relationships, with its social, political and economic context, and laden with values – it demands that an alternative paradigm be used to drive educational research. These multiple realities in education then suit the multiple realities within an interpretivist paradigm and accordingly a researcher will need to use multiple methods to construct these realities (Cantrell 1993:87).

McNiff (1992:17) expresses a few concerns in using the interpretive approach in educational settings in that the methods used lack scientific rigour. Case studies are often ill defined, weaken the academic legitimacy of a study and are more appropriate to sociological issues than to education. McNiff, however, points out that Hirst in 1983 had already acknowledged that educational theory needs to be tested against the reality of practice in order to be valid. Hirst, according to McNiff (1992:18), contributed to restructuring the image of educational research in that it ought to serve the purpose of improving educational practice. A description of the research design and methods employed in this research follows.

6.3 The research design

The nature of this research is a sincere attempt to produce a valid and purposeful curriculum. This study considers the needs of the school community and consequently time and energy have been invested in this investigation which ought to produce a relevant curriculum. This research is not a means to an end but rather a means to a beginning. This sentiment is reflected in Kurt Lewin's (1948) comment that research that produces nothing but books will not suffice (as cited by McNiff, 1992:19. Although this study uses an action research approach to monitor the emerging evidence over time for curriculum development purposes, the major portion of this study is the process of gathering relevant data from the embedded cases through narratives and in-depth participant observations.

6.3.1 The initiating phase of this research design (pilot study)

Cantrell's (1993) point that researchers from the interpretive paradigm seek to understand phenomena and to interpret meaning within the social and cultural context of the natural setting is fitting in the case of this research. Learners at Lilyfontein School have been engaged in various adventure-based activities and obvious benefits for the learners have been observed by parents and educators alike.

These observations initiated a pilot study (documented in Appendix F p. 320) and also described in chapter one where learners were firstly interviewed and then the participants who had experienced adventure-based activities were asked to write narratives. These responses were such that deeper understanding of the learning that occurs was required and an action plan was put into place.

6.3.2 The aim of the design of this study

The aim therefore in the design of this investigation is "...a search for deep perspectives of particular events and for theoretical insights" (Bassey,1995:12). But the aim is also to

use the evidence emanating from this study to improve the school's curriculum. McKernan (1996:3) argues that the ultimate aim of inquiry is understanding, and understanding is the basis of action for improvement. Action for improvement is thus the optimum phrase in this study.

A research design is a plan that guides the researcher in the process of collecting, analyzing and interpreting data. Although Yin's writings are regarded by Bassey (1999:27) as leaning more towards the positivist paradigm, Yin (1984:28) gives clarity to the meaning of design. He states that "the design is the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusions."

The design in this research must therefore consider the 'logical sequence', the methods of collecting valid evidence, analyzing the evidence to produce reliable conclusions and how these conclusions will guide action for improvement. In view of Yin's "logical sequence", this research is a case study of the adventure-based programmes offered at Lilyfontein School. It adopts an action research approach that moves through three cycles (see chapter eight, table 8.1) of continuous planning, doing, assessing, collecting evidence, reviewing, re-doing and re-planning. Each time this process ensures that a new and modified product emerges on the way to the final refined model which would be recommended for adoption by the School Governing Body as part of the Life Orientation curriculum at the school.

6.3.3 The focus of this study

During these cycles data is collected through a variety of methods from a number of embedded case studies. An embedded case study is similar to an ordinary case study except that it involves "more than one unit of analysis" (Yin 1984:49). In this study no significant distinction is made between single or multiple case research since Yin (1984:52) argues that the choice is one of research design with both being included under the case study strategy. It is these embedded cases that will provide the focus and source

for the data that will justify the relevance of adventure-based experiences in promoting self-regulated behaviour.

McKernan (1996:77) claims that a case study is eclectic, using a variety of research styles and methods; it is idiosyncratic and specific; it is process rather than product orientated; and it is rich in description, interpretation, explanation and narrative, working more for understanding than rigorous scientific measurement. On the other hand, Stake (1995:277) argues that the case study can and should be rigorous. The researcher in this study has devised particular tools to record and measure the empirical data as objectively as possible.

As the purpose of this study is twofold, the style of the case study used here would involve two of Stenhouse's (1985:50) proposed styles. Firstly, the **evaluative case study,** as the intention is for this research to show or judge the value of the adventure-based programme currently run at the school. The value of this case study of the learners involved in adventure-based activities would have to be determined by rigorous and valid evidence gained from in-depth observations, narratives and interviews with learners, parents and educators actually involved in the action. This evidence gathering and measuring component will form the major portion of this study.

Secondly, this case study is **action research in progress** (Stenhouse, 1985:50) and will be concerned with relevant feedback from evidence gained in the embedded cases to guide revision and refinement of the curriculum to be adopted at Lilyfontein School. This research will only comment briefly on this component as this aspect of research will continue beyond the realm of this study.

6.4 The Research approach

6.4.1 An overview of the research process

This overview is given in the figure below.

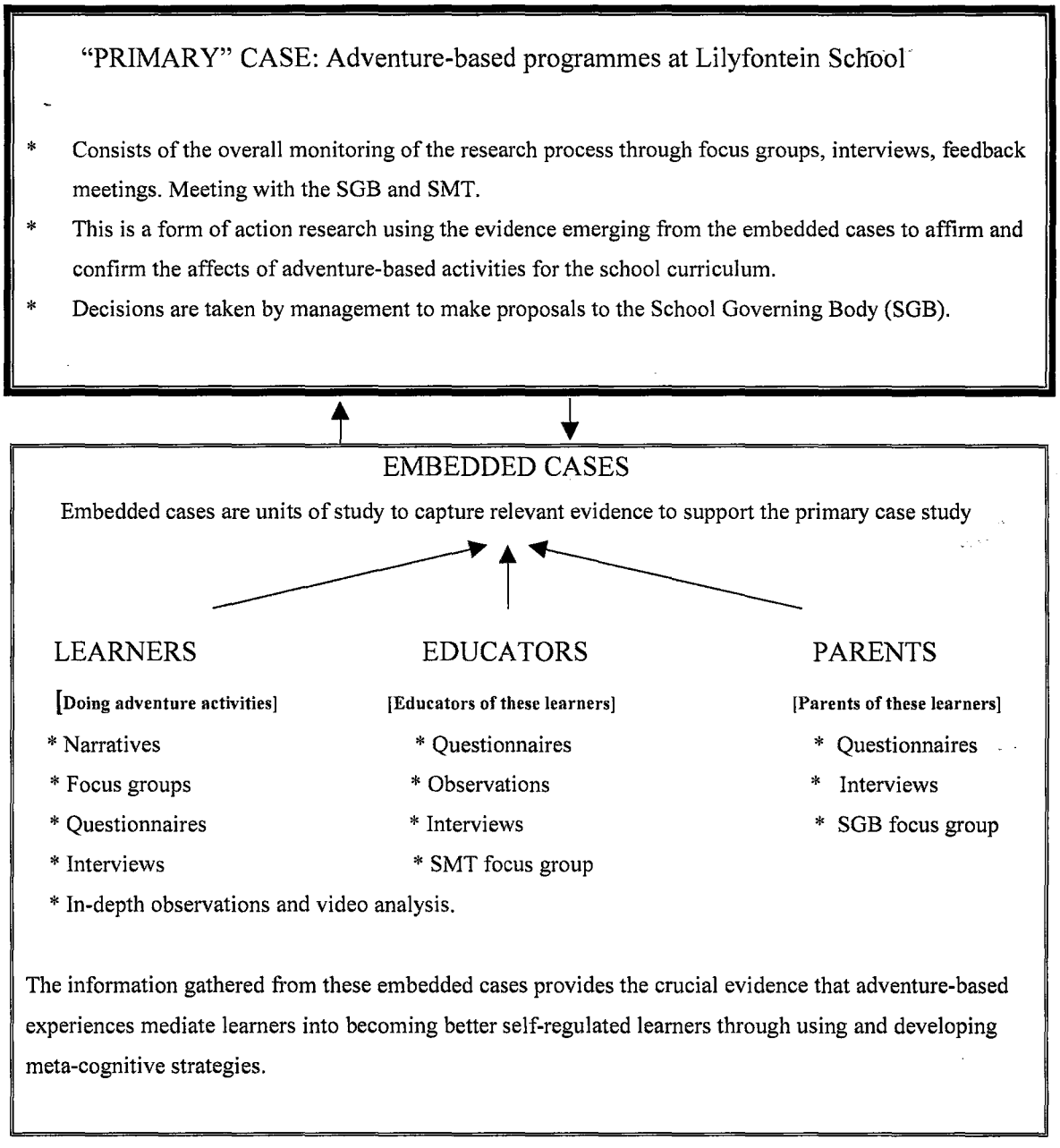


Figure 6(a). An overview of the research process with the main methodological principles involved in this particular case study.

6.4.2 The action research component of this study

In this study the action research component is a vehicle to monitoring the empirical data generated by learners in action doing adventure-based activities. Action research according to Henry & McTaggart (1996:1-2) is a term which is used and misused to cover a myriad of activities, it is widely defined but essentially is a collective self-reflective enquiry undertaken by participants in a social context to improve their practice. Henry & McTaggart (1996) highlight three forms of action research: firstly *Participatory action research* (PAR) which originated from third world developing countries for improving community living conditions, secondly *classroom action research* whereby teachers use self-reflective techniques to improve their own practices and, thirdly *critical action research* which involves social analysis through reflection in a local situation to improve things in a social context. All these forms of action research are characterized by a continuous spiral of action and reflection (Greenwood & Levin, 1998:60).

Action research is an approach that focuses on action as an end result. It is research which aims to improve people's circumstances through personal and organizational improvement, which lead to greater efficiency (Greenwood & Levin, 1998:60). This captures the essence of action research but in order to avoid creating a simplistic impression it is necessary to review a few typologies of action research.

McNiff (1992:33) points out that Kurt Lewin describes action research as a spiral of steps, planning, acting, observing, reflecting. This would move onto the next step of re-planning, acting, reflecting and so on. However, as McNiff (1992) points out, Levin tended towards positivism and did not intend his ideas to be used in educational settings.

Lawrence Stenhouse gave prominence to the teacher as researcher and aimed at liberating teachers from rigid authoritarian roles. The formal schemes of Stephen Kemmis, John Alliot and Dave Ebbut encourage teachers to be researchers through self-reflective practice. Their schemes are criticized for being rigid, confusing and not educational (Mc Niff, 1992:33).

A third type, the critical-emancipatory educational action research belongs to the Deakin model and according to McKernan (1996:27) is very politically orientated.

The model selected for this study is James McKernan's (1988) time-process cycle. It is considered as appropriate because it "... presupposes scope for total curriculum planning, not ad hoc piecemeal reform" and " ... all those with an educational stake in the process need to be involved: parents, practitioners and pupils" (McKernan, 1996:28). The advantage of McKernan's model is that he also borrows concepts and features from the above mentioned typologies of action research and is "... thus eclectic and synthesizing, choosing to select profound ideas from diverse strands of theoretical and practical interventions in the field, rather than dismiss whole paradigms and traditions" (1996:30).

This model was selected for this study as its theoretical base and practical mode of delivery best serves the research into the current needs of the adventure-based component of the curriculum at Lilyfontein School. This position is clarified by McKernan (1996:28) when he says that curriculum action research has implications of three kinds: firstly it can serve to improve problematic situations, secondly it can enhance the personal understanding of the researcher and, thirdly it can serve to illuminate the researcher's environment in which he or she works. The following serves to give a grounded view of McKernan's action research model.

6.4.3 McKernan's model of action research.

McKernan's model is a time process model, which comprises of process steps each with significance and purpose. McKernan's model is illustrated below.

An overriding assumption in this model is that action requires continuous improvement through the use of strategies that encourage reflection and change. In keeping with the underlying philosophy of this research, these strategies are meta-cognitive in nature.

Figure 6(b) below serves to illustrate cycle one showing the beginning cycle of the process.

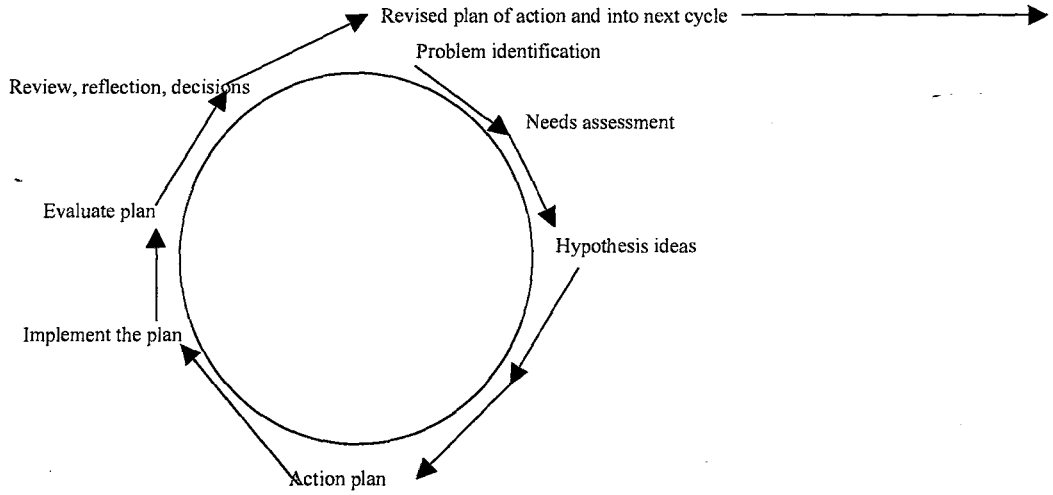


Figure 6(b). Illustrates cycle one showing the beginning cycle of the process

The figure 6c below illustrates the movement of the time process model.

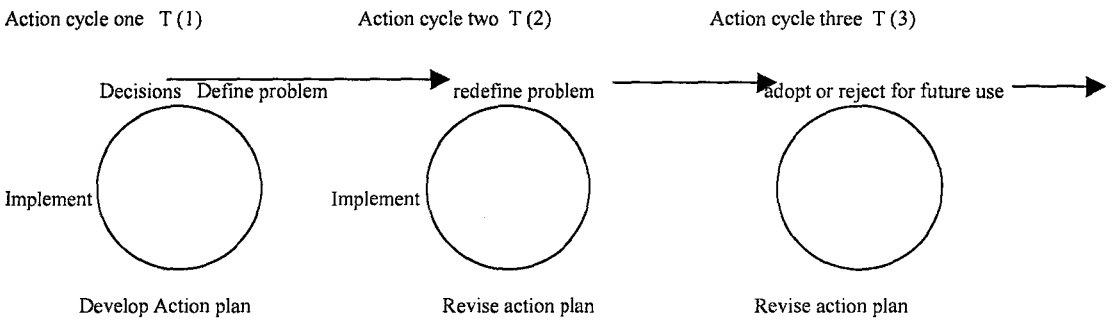


Figure 6(c) Illustrates the movement of the time process model

For practical purposes the researcher has placed McKernan's description of the process into a series of chronological steps. Figure 6(c) illustrates the three action cycles as, T1, T2 and T3 and may be interpreted in the following way according to McKernan (1996).

1. At a particular time a problem arises which needs to be addressed or solved, this triggers the first cycle (T1) to define, assess and clarify the context and the

situation of the problem or need. The school management team (SMT) is aware of the benefits that adventure-based learning has for the students at Lilyfontein School.

2. Once this awareness has been raised a careful statement describing the nature of the benefit is made known. Adventure-based activities help develop self-regulated learners.
3. The stakeholders involved are consulted to avoid possible constraints that may impede the process. School staff, parents, SMT, SGB and the RCL are involved in discussions.
4. The feedback from the above stakeholders would suggest hunches or a hypothesis which would function as strategic ideas worthy of investigating and testing in practice. An empirical investigation is made of the benefits that adventure-based experiences have for developing self-regulated learners.
5. The next step in this cycle is devoted to developing an overall plan of action which would serve as an operational blueprint for the project. A Curriculum Development Committee (CDC) is set up to plan a pilot study to determine the value of such an investigation.
6. Implementation of the plan follows where the plan is installed in the setting and action happens. The learners in action are monitored, observed and measured as they engage in the adventure-based experiences.
7. Continuous evaluation of the action takes place by the group involved and it seeks to understand the effects and what has been learned by the study.
8. Careful reflection, reviewing of the data and evidence are shared by the group in order to make decisions about modification and improvement of the action.
9. Once improvements have been effected and agreed upon the modified model is then set into action in another cycle, T2.
10. The process of these steps may be repeated through further cycles (T3) in order to refine and finalize a model or product for use. "On the basis of evaluation and group critique the action initiatives in the second cycle are further subjected to scrutiny and further decisions are reached" (McKernan, 1996:29). The importance of the next step(s) is that the original research problem is "allowed to redefine

itself as a result of the action in the time period of the first cycle" and "if further testing and experimentation is deemed necessary this would form the basis of the next cycle" (McKernan, 1996:29).

This research uses embedded case studies within these action research steps as each of these embedded case studies exemplifies a component of the overall study of the adventure programme offered at Lilyfontein School. Each of these units of study plays an important part in the meaning and significance of the overall case study and therefore needs to be given independent attention. In this study an embedded case would be a group of students engaged in a rock climbing activity or a group dynamic task. They will be observed in action, given opportunity to give their views and feelings in order to gather information about how these users regard their experiences. This is in line with Cantrell's (1993:84) view that researchers from the interpretive paradigm seek to understand phenomena and to interpret meaning within the social and cultural context of the natural setting.

In order to make meaning of and understand the overall design feature of this research process it is important to clarify the concepts and principles underlying the research process. Robin Hall (1982:26) stresses that the process of conceptualization is based on the grasping of principles, which allow us to discriminate and use words correctly. Hamlyn in Peters (1967:27) then says "...thus an appreciation of general principles implies in the full sense an appreciation of how they are to be applied." Hamlyn continues to argue that having a concept of something is to know the principles that are relevant.

6.5 The research methods

As stated earlier, there are multiple realities within the interpretive paradigm; researchers working within this paradigm need to make use of multiple methods to construct these realities. Multiple sources of evidence are in line with action research and case study strategies and allow researchers to gather accounts of a situation from different points of

view. This combination of methods or sources of data in a single study is termed "triangulation" and is often thought of as guarding against researcher bias and allowing for checking on the reliability of an informant (Taylor & Bogdan, 1984:68). McKernan (1996:75) sees it as important that the researcher employs a number of research methods to secure data, and views the case from various vantage points in order to correlate methods with perspectives.

Case studies typically rely on a variety of techniques for data gathering and are conducted over a period of time. Case studies may rely on superficial observation, in-depth observation, questionnaires, archival records, psychological testing, interviewing and analyzing documents (Rossman & Rallis, 1998:71).

The research methods used in this research will now be discussed. These include: questionnaires, narratives, participant observation, focus or discussion groups, interviews and document analysis.

6.5.1 Questionnaires

McNiff (1992:78) points out that in action research, questionnaires will probably be used in an exploratory fashion to get an idea of trends. In this research, questionnaires are appropriate in the first cycle or pilot phase and are also used as data collecting methods to gather valuable feedback from learners, parents and educators, who form the embedded cases in this study and furthermore are collectively and indirectly responsible for ensuring the ongoing process of this "primary case" case. Questionnaires in this study serve two purposes, firstly as a tool to monitor the overall progress of the primary case-study and secondly to get specific information with regard to value judgements by participants within the embedded cases as they engage in certain adventure-based activities.

6.5.2 Narratives

The use of life narratives as a form of qualitative research is growing in popularity. Narratives are first-person accounts of experiences that are in story format having a beginning, middle and end (Merriam, 2000:286). In this research the participants, who are the learners in the school, write accounts of their own experiences with the adventure-based activities in the form of an uninhibited description or story. Merriam (2000:286) describes the story as a basic communicative and meaning-making device pervasive in human experience.

These narratives of the learner's experience ensure that a rich description of life events and their influences on the learner are told. Rossiter (1999:78) also describes the use of narratives in terms of a holistic psychological approach in that it acknowledges the cognitive, affective, and motivational dimensions of meaning-making. The learners, who are all participants in the adventure-based programme, must therefore be in the best position to be able to express their experiences in terms of value to themselves, cognitively as well as affectively. This in turn serves as a very sound interpretation and assessment of the value of this experience as part of the school curriculum. Bloom (1998:311) claims that narrative research is also important in that it helps us construct social critique and that studies of narratives, when used to construct social critique, also help us construct social action at both personal and collective levels.

The task of the narrative researcher in this study is to be "...dually conscious of the individual and the societal-cultural contexts" (Bloom, 1998:311) in which the learners have their adventure-based experiences. The learners were asked to respond to one question: "Describe your experiences of adventure activities at Lilyfontein." Their responses ought to uncover a wide range of data that will be significant to understanding the value of their adventure-based experiences. Clandinin & Connelly (2000:50) refer to what they call four directions in any inquiry: inward and outward, backward and forward. By inward they mean toward the internal conditions, such as feelings, hopes, aesthetic reactions, and moral dispositions. By outward they mean towards the existential

conditions, that is the environment. By backward and forward they refer to – temporality, past, present and future. They wrote that to experience an experience - that is to do research into experience – is to experience it simultaneously in these four ways. By using narratives the learners' only inhibition is their ability to write and express themselves accurately.

6.5.3 Participant observation

McKernan (1996:64) describes participant observation as the practice of doing research by joining in the life of the social group or institution that is being researched. In McKernan's (1996) opinion, participant observation bears high fidelity with the methodological purpose of action research and is the foremost technique for use in the study of classroom practice and curriculum.

In the interpretivist paradigm the researcher does not control the data collection situation as is done in the positivist paradigm, therefore it is necessary to integrate data collection into the real-life contexts of this study. This involves the activities in which the learners (participants) are engaged in action during adventure-based programmes and therefore in order to achieve the aims of this research, prolonged "fieldwork" was conducted over a period of approximately three years. This entailed the observation of learners by educators, instructors engaged in activities, parents within the home context and extensive in-depth observation by myself as researcher. This process involved observation, recording and measurement during the activity as well as detailed analysis of video recordings of the participants in action during different activities. For McKernan (1996:65) the greatest benefits of participant observation are the collecting of authentic accounts and the verification of ideas through empirical observations. In many of the cases in this research the participant observers were part of the events taking place. This approach is within keeping with Robson's role of the participant observer (1993:159). The advantage here was that all the 'observers' were interacting on a 'first hand basis' (Creswell, 1994:150) and therefore were also able to provide valuable data to the researcher either through written or verbal feedback.

McKernan (1996) says that participant observation is more that just looking; data must be systematically recorded through such means as interviewing, diary keeping, field notes or other data capturing devices. The researcher was also part of the actual process and made extensive use of video recordings of learners who were engaged in the adventure-based activities.

All of the advantages mentioned above need to be carefully considered against the possible disadvantages of participant observation. Taylor & Bogdan (1984:19) warn that researchers should stay away from settings in which they have a direct personal or professional stake. They warn that when one is directly involved in a setting one is likely to see things from only one point of view. Yin (1984:93) cautions against the "potential biases" on the part of the researcher and how the researcher "and the role she takes" may be negatively viewed by the participants. The consequent responses, being skewed to idealistic interpretations, may in turn affect the validity of any study. In this study the researcher is the school manager (principal) and the caution made by both Yin (1984) and Taylor & Bogdan (1984) needs to be taken seriously and considered, as significant decisions are to be made for the purpose of the school's curriculum.

Taylor & Bogdan (1984) do, however, make the point that a good qualitative study combines an in-depth understanding of the particular setting studied and general theoretical insights that transcend that particular type of setting (1984:17). And furthermore their advice is not to hold too tightly to any theoretical interest, but to explore phenomena as they emerge during observations. It is with this insight, the wisdom of many years experience in the field of outdoor education, experience in the area of curriculum development and the interest in giving learners a rich personal growth opportunity through the school's Life Orientation programme that the researcher will pursue this study through making frequent participant observations during adventure-based activities. But he will also seek confirmation, reinforcement and verification of observations through alternative methods and resources.

6.5.4 Interviews

Patton (1990:206) identifies four different types of interviews. Firstly, the *informal conversational interview* to gain information from the immediate context by asking questions. Secondly, the *interview guide approach* where the issues to be discussed are specified in advance and the sequence and wording of the questioning happens during the course of the interview. In the third type, the *standardized open-ended interviews,* set questions with exact wording and in a predetermined are asked.The fourth type is the *closed quantitative interview* where questions are predetermined and participants choose their answers from predetermined fixed responses.

Interview data is appropriate in interpretive research as hermeneutics is the study of the interpretation of texts and the interview is regarded as "the oral discourse transformed into texts to be interpreted" (Kvale 1996:46).

Kvale (1996:117) claims that the caliber of researcher is critical to the quality of the scientific knowledge and to the soundness of ethical decisions in any research project. Through interviewing, the importance of the researcher as a person is magnified because he/she is the instrument for obtaining the information. In the end, however, the integrity of the researcher, his or her honesty, fairness, knowledge and experience, are the decisive factors in determining the validity of the information.

Further to this Bassey (1999:81) points out that the answers of the respondent may well be influenced by the respondent's view of the researcher. As both researcher and principal of the school, the views and responses from the learners in this study may well be inhibited and this factor has been seriously taken into consideration as it may affect the overall validity of the findings of the interviews. The researcher in this study has not given high priority to the interview technique. It has, however, been used in very informal situations and most probably is in line with the "informal conversational" approach of Kvale. Lincoln and Guba (1985:177) believe that the non-standardized interview best supports the purposes of naturalistic research. Interviews in this case did serve to help the

researcher understand the formulation of relevant questionnaires for parents and educators of the participants.

6.5.5 Documents

Documents in this research refer to curriculum documents of the Department of National Education. Namely policy documents such as: Senior Phase (Grades 7 to 9) Curriculum 2005 (Department of Education, 1997), the Revised National Curriculum Statement for schools grade R to 9 (Department of Education, 2002a; Life Orientation), the NCS documents for grade 10 to 12 (DoE, 2002b), the NCS documents for grade 10 to 12, Life Orientation (DoE, 2002c) and Implementation Strategies for 2003 –2006 (DoE, 2003) are analyzed as far as their relevance to this study is concerned. One of the goals of this study is to determine the extent to which the requirements of these Life Orientation curricula are met by the adventure-based programmes offered at Lilyfontein School.

6.5.6 Focus groups

Patton (1990:335) defines a focus group interview as "... an interview with a small group of people on a specific topic". Contrary to popular belief the group situation often triggers off thinking which in turn generates further ideas. This point is captured rather well by Neumann (2000:274) who says that focus groups are useful in exploratory research or to generate new ideas for hypotheses, questionnaire items and the interpretation of results. It has the advantage of gathering data from a whole group in as short a time as possible.

Focus groups in this research were comprised of parents in the School Governing Body (SGB), educators as members of the School Management Team (SMT) and learners of the Representative Council of Learners (RCL). Bloor *et al.* (2001:8) point out that focus groups have a much larger part to play as an ancillary method, alongside and complementing other methods. Bloor (2001) identifies three ancillary roles of focus groups: first, their use in pre-pilot work, to provide a contextual basis for survey design;

second, their use as a contemporary extension of survey and other methods to provide an interpretive aid to findings; and third, their use as a method of communicating findings to research subjects to generate new insights. As an ancillary method, therefore, focus groups may operate at the beginning, middle and end of projects.

All three of these parts have been applied in this research. Pre-pilot contact sessions were used to begin the action research process, in the middle to review findings in order to decide on a way forward and finally at the end of this research these focus groups were constituted out of stakeholders of the school community who contributed to the purposeful verification of the research findings and conclusions. And then ultimately the stakeholders will be responsible for the decisions taken to adopt or reject the emerging proposals. Bloor *et al.,* (2001:6) state that one of the challenges for focus group researchers is to find ways of incorporating focus group methods into participative public decision-making.

Focus groups also serve as a forum to raise issues of concern as well as opportunities to correct or at least discuss misunderstandings and misinformation. Brown (cited by Patton, 1990:335) captures this in saying that "They (focus groups) give rise synergistically to insights and solutions that would not come about without them".

Bloor (2001:7) warns, however, that the focus group's data on meanings may demonstrate the essential ambivalence of interpretations; the rather chaotic character of the findings is not a defect of the method, it is the faithful reflection of the subject matter. The character of the final focus group in this research is to provide critique and discussion of the findings that have emerged from various other methods of data collection and not to collect data per se. In the words of Bloor (2001): "...more common than the use of focus groups as a stand-alone method, is the use of focus groups as an adjunct of other methods" (Bloor *et al.*, 2001:8).

6.6 Verification

Positivists typically speak of validity, reliability and objectivity when assessing the worth of a study. Based upon the underlying assumptions of the paradigm, these concepts do not transfer directly to interpretive inquiry (Cantrell, 1993:100). Undoubtedly designing and executing 'valid' research is the goal of all researchers. Following Cantrell's (1993) point, validity, rigor and trustworthiness of one's research depends on the particular research paradigm. A researcher within the positivist paradigm seeks to uncover the 'truth' and relies on the objective and rigorous nature of methodological rules and standards to ensure validity, whereas within the interpretivist paradigm the researcher strives for "... a way to claim legitimacy and trustworthiness without the necessity of laying claim to uncontested certainty" (Angen, 2000:379).

Janse van Rensberg (1994:8) makes the point that the constructivist approach to research, interpretivism, focuses on the meaning which people make of their reality. The epistemological assumption here is vastly different and therefore the criteria for assessing research in the interpretivism paradigm must necessarily be different from assessing validity in the positivist paradigm (Lincoln & Guba, 1985:219). Lincoln & Guba (1985:294) offer alternative criteria to the positivist's validity, reliability and objectivity in that they suggest credibility, transferability, dependability and confirmability. This research uses ***'trustworthiness'*** as an alternative to 'validity', ***'credibility'*** instead of 'reliability' and ***'applicability'*** instead of 'generalizability'. Each concept will be discussed in turn.

This research uses an action research process to generate a curriculum relevant to the school's context which fulfils the national curriculum requirements of the learning area Life Orientation. A common challenge to action research is that it is subjective and therefore unreliable, meaning that the solutions it claims to produce cannot be universally tested and are therefore invalid. McNiff (1992:131) offers the point made by Pam Lomax (1986) that:

> ... as action researchers we do not claim to find the final answer to a question, but we do claim to improve (and change) educational practice through the educational

> development of practitioners. The validity of what we claim would seem to be the degree to which it was useful (relevant) in guiding practice for particular teachers and its power to inform and precipitate debate about improving practice in the wider professional community. (McNiff, 1992:131)

McNiff (1992:131) puts forward three aspects to validity in action research, namely: self validation, peer validation and learner validation. McNiff uses the idea of *self validation* to argue that the strength of action research is that individual teachers interpret their own practice and make decisions about improving it. She continues to argue that research findings are of social value only if they may be communicated to others and therefore the idea of *peer validation* is an important issue. Finally McNiff claims that it is particularly useful to get on record the reactions of the clients themselves and that their evidence "... is perhaps the strongest support in the researcher's claim to knowledge" (1996:135), hence the idea of *learner validation.*

6.6.1 Trustworthiness

Rossman and Rallis (1998:43) argue that the trustworthiness of a qualitative research project is judged by two interrelated criteria: that firstly the study conforms to standards for acceptable and competent practice and secondly that it has been ethically conducted with sensitivity to the politics of the topic and setting. Rossmann and Rallis continue to make the point that for a study to be useful it must have credibility to the users, be they researchers, policy makers, practitioners or the participants themselves and furthermore each group assesses the study's integrity using different criteria. These authors (1998:44) also make the significant point that "... integrity implies soundness of moral principle – the ethical dimension that constitutes the element of trustworthiness".

Bassey (1999:75) claims that a case study is the study of a singularity which is chosen because of its interest to the researcher or sponsor. It is not chosen as a 'typical' example in the sense that typicality is empirically demonstrated, and so issues of external validity are not meaningful. As an alternative to reliability and validity, Lincoln and Guba(1985:) put forward the concept of 'trustworthiness' and in Bassey's view this successfully

illuminates the ethic of respect for truth in case study research. Bassey (1999:77) also makes a strong case for the respect for persons in case study research.

Robson qualifies Bassey's view when he argues that trustworthiness relies "... on the 'human instrument' (the researcher) rather than the data collection techniques per se" (1993:160). He puts forward personal qualities that researchers should possess in order to successfully conduct case study research: "an open and enquiring mind; being a good listener; adaptiveness and flexibility".

6.6.2 Credibility

Robson (1993:403) regards credibility as the parallel construct to 'internal validity' and points out that case studies are more prone to threats of internal validity but that there are techniques that can be put in place to minimize these threats. Robson (1993:76) quotes Shipman (1988): "Is there sufficient detail on the way the evidence is produced for the credibility of the research to be assessed?". Different authors propose a variety of techniques:

Rossmann and Rallis (1998:45) propose a few strategies that help establish the truth claims of qualitative research.

- Data to be gathered over a period of time, not in a 'one-shot' manner.
- Sharing interpretations of findings with participants.
- Designing the study as participatory or action research throughout the study.
- Triangulating by drawing data from several different sources.

Robson's (1993:404) techniques to enhance credibility – prolonged involvement, persistent observation, triangulation and peer debriefing – have a close similarity to Rossmann and Rallis's techniques.

6.6.3 Applicability

Applicability according to Rossmann and Rallis (1998:47) parallels the objectivist concern for generalizability in quantitative research, and qualitative research does not claim to be generalizable in the statistical sense, but it can be useful for other settings.

> - To establish the usefulness of a study, provide rich, thick description of your theoretical and methodological orientation and the process as well as the results. Another useful strategy is to provide as much detail about the context as possible. (Rossmann & Rallis, 1998:47)

Robson (1993:405) argues that the onus for making generalizations shifts to the person interested in applying findings into another case in order to make such a generalization or transfer to reach that decision. Lincoln and Guba (1985:) state it that "it is not the task to provide an index of transferability; it is his or her responsibility to provide the data base that makes transferability judgments possible on the part of the appliers".

This research concerns the context of Lilyfontein School and the emergent findings which are directly applicable to the stakeholders and conditions of this school and how the findings and process of action research improve the curriculum offerings at this particular school. The context differs from other educational settings and therefore the idea of generalizability has very little relevance.

6.6.4 Research ethics

Bassey (1999:74) proposes three values that are critical to ethics in research, namely: respect for democracy, respect for truth and respect for persons. Interpretive researchers are concerned with making decisions about how they should conduct themselves and are "therefore concerned with the rights and responsibilities of both researcher and researched" (Scott, 1996:68).

This research study's intention is to improve an educational setting; Stenhouse (1985:53) makes the point that:

> In an educational case study where the purpose of the research is to improve educational practice and hence the lot of children and the professionalism of teachers there is at least some room for the consideration of the responsibility of subjects to take risks on professional grounds. (Stenhouse, 1985:53)

A strong case is made here for the professional capacity of researchers in taking decisions to study a context in that their integrity and intention is sound and based on moral principles. Like Kant, we believe these moral principles direct us to act as we would want everyone else to act in any given situation – in ways that treat humanity as an end as well as a means (Rossman & Rallis, 1998:48).

6.7 Reflection on this chapter

This research is located within a qualitative research framework. This chapter has served to build the argument that an interpretivist paradigm is best suited to the nature of this research. This study is about analyzing and interpreting participants' experiences in action as they engage in adventure-based activities during the Life Orientation curriculum. The research design, approach and methods described in this chapter serve to highlight the phenomenon of action and ought to provide evidence as to what the learner learns through the adventure-based action and how this learning experience adds value to the curriculum offered at Lilyfontein School which is monitored by an action research approach.

Cantrell (1993:84) emphasizes the importance of seeking to understand phenomena and interpret meaning within the social and cultural context. This research method has aimed to do just that through three approaches. Firstly it has endeavoured to capture in narrative form the feelings of the participants about their experiences during adventure activities, secondly it has attempted to do in-depth observation and analysis of the participants as they engage in the activities, and thirdly to capture observations and comments from teachers, parents and fellow students within their social context. In doing this McNiff's (1996) three aspects of validity namely, self-validation, peer validation and learner validation (see p. 84) will be realized. This will serve to validate the action of an

interpretive researcher who needs to focus on "...human activity in context and the offspring of such activity" (Packer & Addison, 1989:20).

The methodological approach to this research has therefore taken two facets, a primary case and a secondary case. These facets are not mutually exclusive but have a complementary role to support the goals of this study. The primary case is about the value of adventure-based activities in the school's curriculum offerings and the secondary case is about finding empirical evidence of what the learning value of adventure activities holds for learners in becoming better self-regulated learners. These two facets require a variety of data gathering techniques as discussed in this chapter.

Chapter 7
The Research Process

In order to give a clearer picture of the process involved in this research chapter seven illuminates the research design and methods used in this study.

7.1 The research design

As previously stated, the goals of this study may be divided into a primary and a secondary goal.

- The primary goal is about relevance to curriculum requirements. This design regards Lilyfontein School and its curriculum as the primary case. It investigates the effectiveness of the use of adventure-based activities at Lilyfontein School in fulfilling the requirements of the National curriculum for Life Orientation and furthermore uses the emerging data from the study to modify and develop more effective programmes.
- The secondary goal is about what learning actually takes place during adventure-based activities (embedded cases). It is to determine the extent to which adventure-based programmes at the school mediate the participants' learning so that they become better self-regulated learners. A self-regulated learner has the ability to use meta-cognitive strategies to think about and control one's own learning and cognitive system (Brown, 1987:66). Meta-cognitive strategies include elements like: reflective thinking, self-planning, self-monitoring, self-evaluation and self-modification (see chapter four for detailed descriptions of these concepts).

This research then takes the form of a case study referred to here to as the 'primary case study'. The primary case study is the investigation of the adventure-based learning programmes used in the Lilyfontein School's Life Orientation curriculum.

This case study uses McKernan's action research model to pilot, study and monitor the adventure-based learning programmes being applied in the context of the school as these programmes are required to be modified over time. As mentioned previously this research

study then adopts a tri-cyclic approach over a period of two years: Cycle one of six months, cycle two of twelve months and cycle three of six months. Although this research reports across the above mentioned time frame, the action research approach used here will continue beyond the time of this study. The lack of research in using adventure-based learning as a mode of delivery for the Life Orientation curriculum means that this study will need a more extended monitoring period.

As mentioned in chapter six, the action research model used in this research has a series of embedded case studies or embedded units (Yin, 1994:60) which serve to highlight the experiences of participants within these cases. As Robson (1993:53) argues, a case study is a strategy and not a method, and therefore is about research in a broad sense and relies on the collection of evidence in particular contexts. Each embedded case study provides a different set of conditions and therefore the emerging data is specific to each case. This data does, however, serve to corroborate and reinforce, through triangulation, the findings in the overall or broader primary case, i.e. the effectiveness of the Lilyfontein adventure-based programmes on self-regulated learning strategies.

7.2 Case studies

This research involves the study of human action within a variety of activity systems. These activity systems are within different settings but all comprise of humans in purposeful action. The embedded case studies or embedded unit in this research create the necessary focus to allow for the collection of data to be used as supporting evidence in the analysis of the activities conducted in adventure-based education. The embedded unit is regarded by Yin (1994:119) as "... a lesser unit than the case itself". The evidence from the embedded case studies will in turn serve to inform the action research component and consequent decision making with regard to the future curriculum offerings.

7.2.1 The primary case

The primary case study includes the overall activity system which is made up of the following components: the school, the environment, the teachers and instructors, the learners and participants in the adventure activities, the parents of the children involved in these activities, the Curriculum Development Committee (CDC), members of the School Governing Body (SGB), members of the School Management Team (SMT), as well as the researcher. All of these components play an active and influential role in the process of the action research where decisions are taken that seriously affect the next cycle or phase of development.

7.2.2 The embedded cases

The embedded cases or units form the various components of the primary case. They provide the source for the qualitative and quantitative evidence to inform the decisions taken in the action research model of the primary case. Yin (1994:119) explains that the embedded unit has a "service outcome", its propositions are related but different to the larger case.

7.2.2.1 The learners

The learners consisted of a range of participants from grade 5 to grade 12 engaged in a wide variety of different activities listed below. These learners' ages range from more or less eleven to eighteen years old.

The activities involved experiences in the following: climbing-wall practice, rock climbing, abseiling, cycling, kayaking (canoeing or paddling), obstacle course events, group dynamic tasks, hiking, dam swimming and survival camps. In chapters ten to thirteen where the research findings and discussion are provided, a clear explanation of each of the selected activities is provided so that the activity system is analyzed in relation to the 'elements' of each embedded case study. In adopting Engeström's (1999)

model of an activity system, the elements of the system that are analyzed are the object, subject, tools or artifacts, rules, community and division of labour as explained in chapter five, pp.80 – 85).

7.2.2.2 The educators

The educators involved were the class or subject teachers of the learners who were not necessarily always involved with all the activities. The educators were asked for their observations on the learners who had returned to the classroom after being involved in the adventure-based activities. They were also asked to give their opinions on how they thought that learners benefited from the adventure-based experiences over time. Great care was taken by the researcher to ensure that he did not influence the opinions of the educators. They were asked very general questions, namely:

- "What do you objectively observe about the children's behaviour, after they have taken part in activities that you can identify as being different?"
- "What benefits to learning do you think are offered to the learners by including adventure-based activities in the curriculum at school?"

7.2.2.3 The parents

Parents were asked to respond to the following question:

- "What do you objectively observe in your child's behaviour and habits that you can attribute to the inclusion of adventure-based activities into the school curriculum?"
- "Are you able to give examples to substantiate your observations?"

7.3 Data collection

Multiple methods of data collection were employed in line with an interpretive approach to research. These varied methods are in line with a case study and action research approach where the intention is to ensure a strong triangulation. The methods used were described in theoretical detail in chapter six in sections, 6.5.1, 6.5.2, 6.5.3, 6.5.4, 6.5.5

and 6.5.6 respectively. The methods were questionnaires, narratives, participant observation, interviews, focus groups, and analysis of documents.

7.3.1 Questionnaires

Questionnaires were use to gather information from the educators and parents regarding their observations on the learners in class or at home.The first set of questionnaires was administered during the second cycle of the action research process. It consisted of five questions with reasonably leading questions. An example of the first and second set can be seen in appendix.

The second set of questions was more open ended and the expectation was that the participants would provide richer information for two reasons. Firstly, the two questions asked required more reflective thought from the participant and secondly, because it had been administered in the third cycle, the participants would have had almost a year to think about their previous responses and consequently apply their minds to the observations they have made on their children engaged in the adventure-based programmes.

The responses to the above questions asked were not given much thought by the sample of respondents and therefore are not valuable for the purpose of this study. The researcher then decided to pose one question to the two groups of parents of the grade 6 to 12 learners. This question was:

What observations of your child at home could be attributed to adventure activities and why do you think this?
Responses to this parent observation question are detailed in chapter ten.

7.3.2 Narratives

In order to capture the meaning learners attributed to adventure experiences they were asked to write about their feelings with regard to any of their adventure experiences. The learners from grades 8, 9, 10 and 11 were asked to respond to the following question:

- Describe why you think that doing adventure activities has been of value to you and why you think the school should retain these activities. Give examples to support the points you are making.

Fifty four learners responded to the above question with narratives written according to their own style. In order to guard against the possible influence of the researcher the learners were not prompted or influenced into preconceived answers. The researcher also did not engage in a prior preparatory talk or discussion or a 'lead-in' with the learners writing the narrative. The goal here was for learners to be free to express their genuine feelings on their experiences; they were not required to put their names on their responses as it was felt that this may inhibit truthfulness.

In order to interpret the narratives gathered, the researcher adapted an analytical method used in phenomenological research within the field of psychology. The phenomenological approach identifies what the writers of narratives regarded as important. Stones (1988:153) proposes that since phenomenological research is engaged research, narratives of actors are broken down into naturally occurring units each conveying a particular meaning which emerges spontaneously from the reading of it. Stones (1988) continues to say that each unit is termed a Natural Meaning Unit (NMU) and he quotes Cloonan's (1971:117) definition as "a statement made by the subject that is self-definable and self-deliminating in the expression of a single, recognizable aspect of the subject's experience and furthermore the data should speak for itself" (in Stones, 1988:p153).

By looking at words and themes which are expressions of thoughts, ideas and even concepts, the researcher took these to be Cloonan's (1971) Natural Meaning Units (NMUs) and in this way extracted from the narratives elements of similar meaning. These elements have been identified as being meta-cognitive in nature. By quantifying these NMUs, a rate of occurrence of the elements was established in order to give an idea of the frequency of use of these elements. These results are tabled in chapter ten's analysis of the narratives from grade 6, 7, 8, 9, 10 and 11 learners.

7.3.3 Participant observation

Naturally a participant observer has to guard against being seen as 'intrusive'. The adventure activities in this study are happening on a regular basis as part of the school day and the learners appear to have become used to someone watching their efforts. The researcher or other staff members like the class educator have been encouraged to be part of the activities to observe and be in a position to debrief and discuss the experience back in the classroom context. This is regarded as a critical part of this experiential learning process. Observers would make mental or field notes and briefly transcribe them later when the researcher would interact with the observers regarding experiences of the activity.

The researcher made in-depth observations while the learner is in action and for logistical reasons captured video footage of learners engaged in a variety of activities. This is in keeping with Taylor and Bogdan's "...video tape machines being used as recording devices in the field" (1984:57). Video recordings have been made and analyzed as an instrument of participant observation during rock climbing practice, abseiling, and during survival camp tasks. Survival camp tasks included the group tasks of building shelters, bridges and rafts. Each of these will be explained and analyzed in detail in chapters ten, eleven and twelve as part of the analysis of the selected observations.

The researcher was unable to find suitable measuring tools or rubrics to analyze the observation of participants during the adventure activities and has developed a number of

such tools and rubrics, which are to be seen in chapters ten to thirteen. Some of these tools have also been used to assess the learners as part of the Life Orientation's forms of assessment as required in the senior phase of the GET. In particular the form of assessment used is referred to as a Practical Demonstration. According to the Senior Phase Assessment Guidelines for Life Orientation (DoE, 2001:41) is described as:

> A real life action where learners have the opportunity to participate in an activity. It is a practical showing or demonstration of skills with rules and action within a particular context such as: Human movement and Expressive action. (DoE,2001:41)

The researcher previously made the point that Engeström's activity theory model did not adequately provide clear explanations for the resolution of "contradictions" that occur between elements in the activity system. According to the researcher, closer observation of an action reveals that an observer is able to identify the meta-cognitive strategy (MCS) that is being employed by the participant in trying to resolve the problem that he/she has encountered. The various forms of the relevant meta-cognitive elements, i.e. planning, self-evaluation, self-monitoring, self-motivation, self-control, decision making, problem solving and self-confidence were identified and recorded by means of a code. The frequency of the use of meta-cognitive strategies (MCS) by the participants engaged in some of the previously described adventure activities, i.e. rock climbing, group dynamics, abseiling and wall climbing was then determined. This information was gathered through the data collecting techniques mentioned in chapter six; video analysis and actual observation in action has been summarized in the overall matrix format found in table15.2.

In order to make more accurate observations, the researcher had to remove himself from the dynamic of instruction and only engage himself with the observation. This meant that the researcher had to find a method of being able to observe (keep a focused eye) on the participants in the activity and at the same time record the observations being made. For logistical reasons the observations had to be limited to one individual at a time and only four participants were observed in each grade; grades 6, 7, 8 and 9. This took a period of three months to complete.

As the researcher was unable to find an existing method used to measure the frequency of participants using meta-cognitive strategies he employed his own method. The researcher, being a qualified provincial gymnastics judge, employed a very similar method that gymnastic judges use to determine the score of a gymnast. This method uses the technique of watching the activity and simultaneously jotting down a symbol representing the meta-cognitive element (MCE) that the researcher has identified in the participant's action. This was done by placing the name of the participant on a prepared recording sheet of paper (appendix C), and the researcher then proceeded to observe the learners in action and record the observations as they happen. The sheet was divided up into three components, (1) pre-task or activity (2) monitoring the actual task or activity and (3) post task review. Appendix D illustrates an example of the scoring and recording method that was used during an activity.

The following were the symbols used to record the meta-cognitive strategy (MCS) used in an adventure activity:

P = planning, E = self-evaluation, M = self-monitoring, C = Self-confidence, V = Self-motivation, F = self-control; fear, anxiety, etc., T = communication, D = decision making, B = problem solving.

The symbols that had been recorded on the sheet of paper were added up to find a value that has been used by the researcher to indicate the frequency of use of meta-cognitive elements in the observed activities. This serves as an indicator of the amount of practice and training that adventure type activities give learners in the use of meta-cognitive skills or strategies. Schunk (1994:13) claims that there in a considerable body of evidence that teaching students to use self-regulatory or meta-cognitive strategies can improve the effectiveness of their learning methods.

7.3.3.1 Meta-cognitive strategy used as an indicator of self-regulation

When in the opinion of the researcher the participant's next move in the activity was due to assistance from peers or the instructor the researcher circled the symbol. The circle in this case signifies the ZPD as described earlier in chapter five. The frequency of

appearance of the circles would indicate the participant's ability to use meta-cognitive tools independently. The greater the frequency of the circles the less independence and greater reliance on the act of scaffolding or the ŻPD and conversely fewer circles would indicate more independence. According to the researcher, this factor then an indication of the participant's level of self-regulation. "Research has shown that strategy training that includes meta-cognitive components prepares students to know when and where to use it" (Schunk & Zimmerman, 1994:13).

7.3.4 Interviews

The ethos created in the school currently is one of growth and development with the goal that by the year 2006 an effective adventure programme needs to be in place at the school. This ethos is shared by educators, learners and parents and with this as an underlying mind-set, the researcher believes that informants themselves will guard against giving the ideal response and rather add value to the actual experience that will inform change and development.

7.3.4.1 Learners

Conducting personal semi-structured interviews enabled the researcher to pursue a particular line of thinking which was not possible in the questionnaires. In this way a clearer line of thought and insight into the meanings behind the adventure experience was possible. The 'open-ended interview' (Patton, 1990:206) was used to obtain information from all interviewees, however, with the lower grade learners (grades 4, 5 and 6) this was not successful so a more structured approach to questioning was adopted by the researcher. This was done through questions that addressed specific key topics. It could be argued, however, that this approach was leading and suggested what responses were being sought.

Interviews were conducted with learners in a semi-formal context. They were learners from grades 7, 8, 9, 10 and 11; in all cases an attempt was made to select learners who were thought to be more articulate. The goal was to get a sense of a measure of reliability that different grade levels would provide in their responses to other data capturing methods.

The researcher found that he was unable to record the events of the interviews successfully enough to be reliable sources of information and therefore only used limited examples in the discussion of findings.

7.3.4.2 Educators

Two educators were interviewed using a more in-depth method to ensure that their interpretation of the value of adventure experiences was objective and authentic. It also served to ensure that the explanations the educators were offering on their observations of how they interpreted the benefits for the learners were educationally sound and based on sound theory. The one educator is responsible for the adventure programme delivered to grade 4 to 6; the other delivers the programme for grade 7 to 11. Both educators are actively involved in delivering the adventure programmes activities to the learners on a daily basis.

Both of the educators are experienced educators who share great enthusiasm for outdoor education, consequently the researcher had to be constantly aware of the potential for bias and subjectivity. To this end the researcher frequently adopted a 'socratic' or 'devil's advocate' approach by asking questions to confirm and re-affirm the responses from the educator. Care had to be taken that the socratic approach was not construed as the researcher adopting a negative attitude towards answers provided by the interviewees. By virtue of the position of the researcher (principal) in the school, great care had to be taken to ensure that the researcher was "... not pushing an agenda" but "... to come across as someone who is not quite sure what questions to ask and is willing to learn from the informants" (Taylor & Bogdan, 1984:89). Taylor and Bogdan (1984) continue to say that

a qualitative interviewer has to find ways of getting people to start to talk about their perspectives and experiences without structuring the conversation and defining what they should say.

7.3.4.3 Parents

Three parents were selected according to their willingness to offer critique and their involvement in the school. Parents have been monitoring the progress of adventure programmes from the parents' perspective. These parents were interviewed using a log-interview approach where informants (parents) have kept a running record of the progress of the adventure activities and their effects (Taylor & Bogdan, 1984:91). They were interviewed in what Zimmerman and Wieder (1977) call a "diary-interview method" which amounts to feedback from the parents based on their observations and conversations with other parents. From an action research perspective this certainly has given valuable information for the growth and development of the adventure programme. The information from these parents was used mainly for discussion points during the different focus group meetings.

7.3.5 Focus group

Focus groups in this study were used for different purposes: firstly to get feedback information from the range of groups that are involved in this action research process; secondly to find consensus on a way forward regarding adventure programmes; and finally as a mechanism to keep all the stakeholders informed about the progress of the information gathering process.

As previously stated (p.119) Patton (1990:335) defines a focus group interview as "... an interview with a small group of people on a specific topic". This idea of generating more ideas through a discussion group is captured rather well by Neumann (2000:274) in arguing that focus groups are useful in exploratory research or to generate new ideas for hypotheses, questionnaire items and the interpretation of results. A focus group has the advantage of gathering data from a whole group in as short a time as possible. The use of

focus groups (SGB, SMT, SGB Exec) meeting to review and discuss current issues relating to the adventure aspect on a regular basis has enabled this research to move ahead with the focus groups, having taken collective but meaningful decisions.
This research has regarded existing groups within the school context as focus groups in that they form part of the natural organization of the school. In this way the research process would be facilitated because meeting times for these groups are set. Although the business for these meetings was usually related to the general running of the school and not specifically orientated towards adventure aspects, time was allocated to review and discuss the progress regarding adventure activities.

The focus groups were made up of the following stakeholders in the school;

- Members of the School Governing Body (SGB) (parents and educators)
- Members of the SGB Executive committee (parents and educators)
- The School Management Team (SMT) (educators)
- The Representative Council of Learners (RCL) (grade 8 to 12 learners)
- A Curriculum Development Committee (CDC) comprising of executive committee members as well as SMT members.

The above focus groups met for a total of fifteen meetings over the three action research time-cycles.

7.4 Document analysis

Document analysis in this research refers to the review and analysis of the outcomes and assessment standard requirements as contained in two National Education Department documents:

7.4.1. The Revised National Curriculum Statement (RNCS) for Life Orientation Grades R to 9 (2002a).

7.4.2. The National Curriculum Statement (NCS) Grade 10 –12, draft: Life Orientation (2002b).

The purpose of this document analysis is to extract the relevant concepts that the National Life Orientation curriculum expects to be incorporated as outcomes into learning programmes that ought to be delivered at school level in the GET and FET bands.

7.4.1. The Revised National Curriculum Statement (RNCS) for Life Orientation (2002)

The analysis in this section will only refer to the grade 4 to 9 Learning Outcomes and their related assessment standards as contained in the above-mentioned document (7.4.1). The purpose for this is twofold; *firstly* to highlight the assessment standards that are relevant to the nature of adventure education and have the potential to be learned through the variety of activities done in adventure programmes, and *secondly* to indicate where the meta-cognitive terms or concepts as used in this study occur in the context of the Learning Outcomes of Life Orientation. The meta-cognitive terms will be underlined for clarity.

Extracts from the document: Revised National Curriculum Statement (RNCS) for Life Orientation (2002) are listed below.

- Each **Learning Outcome** (LO) is stated and then each **Assessment Standard** (AS) relevant to adventure-based education is stated.
- The meta-cognitive terms or elements are underlined.

Learning outcome 1: Health Promotion

The learner will be able to make informed decisions regarding personal, community and environmental health.

Grade 4:

- Learners are able to explore and report on links between a healthy environment and personal health.

Grade 5:

- Learners can explain the individual health and social effects of substance abuse.

Grade 6:

- Participates in a problem solving activity to address an environmental health issue to formulate environmentally sound choices and/or actions.

Grade 7:

- Proposes ways to improve the nutritional value of own personal diet.
- Discusses the personal feelings, community norms, values and social pressures associated with sexuality.

Grade 8:

- Demonstrates informed, responsible decision making about health and safety.
- Examines a health and safety issue related to violence, and proposes alternatives to violence as well as counter-strategies.

Grade 9:

- Develops and implements an environmental health programme.
- Investigates personal and social factors that contribute to substance abuse and suggests appropriate responses and rehabilitation options.

Learning Outcome 2: Social Development

The learner will be able to demonstrate an understanding of and commitment to constitutional rights and responsibilities, and show an understanding of diverse cultures and religions.

Grade 4:

- Discusses children's rights and responsibilities as stipulated in the South African Constitution.

- Identifies and explains stereotype, discrimination and bias.

Grade 5:

- Applies children's rights and responsibilities to a range of problem situations.
- Able to deal with stereotype, discrimination and bias.
- Discusses the significance of friends in times of tragedy and change.

Grade 6:

- Reflects on own application of children's rights as stated in the SA constitution.
- Deals with gender stereotyping, sexism and abuse in personal and social relationships.
- Discusses the dignity of the person in a variety of contexts including religion.

Grade 7:

- Discusses the application of human rights as stated in the constitution.
- Explains how to counter gender stereotyping and sexism.

Grade 8:

- Discusses violations of human rights and plans counter-strategies.
- Explains democracy and functions democratically.

Grade 9:

- Debates issues with regard to citizens' rights and personal choice.
- Critically discusses social relationships in variety of situations.

Learning Outcome 3: Personal Development

The learner will be able to use acquired life skills to achieve and extend personal potential to respond effectively to challenges in his or her world.

Grade 4:

- Identifies own strengths and those of others and able to convert less successful experiences into positive learning experiences.
- Explains why other persons' bodies should be respected.
- Considers and interprets the emotions of others.
- Demonstrates the ability to select and apply useful responses in conflict situations.
- Reflects on and learns from own personal experience of working in a group.
- Applies appropriate study skills.

Grade 5:

- Identifies personal successes and develops an action plan for continued positive self-concept formation.
- Shows understanding of and respect for body changes.
- Appropriately expresses and copes with a range of emotions.
- Explores and evaluates ways of responding effectively to violent situations and contexts.
- Reflects on how feedback can be given and received.

Grade 6:

- Reflects on own abilities, aptitudes, interests and strengths as well as body image.
- Explains how to respond to peer pressure in different situations.
- Demonstrates compassion by caring for people and animals.
- Demonstrates peacekeeping and mediation skills in different conflict situations.
- Able to reflect on self-management skills (coping skills) in different experiences.
- Describes and selects a range of problem solving skills for different contexts.

Grade 7:

- Implements strategies to improve own and other self-image through positive actions.
- Explains and evaluates own coping with emotions and own response to change.
- Shows evidence of respect for others and the ability to disagree in constructive ways.
- Demonstrates and reflects on decision making skills.

Grade 8:

- Analyzes and discusses factors which influence self-concept formation and self-motivation.
- Reflects on appropriate behaviour in different kinds of interpersonal relationships.
- Able to cope with depression, crisis or trauma.
- Able to cope with the prevention and management of stress.
- Able to apply problem-solving skills in a personal context.

Grade 9:

- Able to analyze and reflect on positive personal qualities in a range of contexts.
- Responds appropriately to emotions in challenging situations.
- Able to critically reflect on own behaviour in a challenging situation.
- Applies goal setting and decision making strategies.
- Able to critically evaluate own problem-solving skills in a challenging situation.

Learning Outcome 4: Physical Development and Movement

The learner will be able to demonstrate an understanding of and participate in activities that promote movement and physical development

Grade 4:

- Demonstrates different ways to locomote, rotate, elevate and balance, using various parts of the body, with control.
- Identifies dangers and responsible measures in and around water.

Grade 5:

- Performs movement sequences that require consistency and control.
- Safety measures around water.

Grade 6:

- Participates in a physical fitness programmes designed to develop particular aspects of fitness.
- Applies basic First Aid in different situations.

Grade 7:

- Participates in an outdoor adventure programme through orienteering in different environments.
- Performs a sequence of physical activities including rotation, elevation and balance movements.
- Participates in a fitness programme.

Grade 8:

- Plans and participates in an adventurous recreational outdoor activity.
- Takes part in a programme to improve techniques of rotation, balance and elevation.
- Participates in fitness programmes.

Grade 9:

- Participates and evaluates own performance in adventurous recreational outdoor activities.
- Refines and improves on own and others' rotation, balance and elevation movements.
- Sets own goals for physical wellness and improvement.

Learning Outcome 5: Orientation to the world of work

The learner will be able to make informed decisions about further study and career choices.

Grade 7:

- Explains the value and importance of work
- Demonstrates time management skills, accountability and responsibility in carrying out tasks.

Grade 8:

- Investigates career and study opportunities related to own interests and abilities.

Grade 9:

- Motivates own career choices.
- Outlines a plan for own lifelong learning.

7.4.2. The National Curriculum Statement (NCS) Grade 10 –12, draft: Life Orientation.

In this analysis consideration must be given to the fact that this NCS for the FET phase has not as yet been incorporated into schools curricula and may alter after this research had been completed.

Consideration must be given to the fact that Life Orientation will be regarded as a compulsory Learning Area in the FET from 2006. This further substantiates the importance of the evidence generated by this research study in order to give sound reasons for Lilyfontein School to be able to justifiably use adventure based activities as a learning experience for learners to achieve the relevant Learning Outcomes as stated below. Again the meta-cognitive elements are identified and underlined in the Assessment Standards of each Learning Outcome.

Learning Outcome 1: Personal Well-being

The learner is able to demonstrate knowledge, values, attitudes and skills to achieve and maintain personal well-being.

Grade 10:

- Applies strategies to enhance own and others' self-esteem.
- Explores characteristics of a healthy and balanced lifestyle.

Grade 11:

- Provides evidence of the ability to plan short, medium and long term life goals and address barriers to achieve these goals.
- Explains different life roles and these can be handled effectively.

Grade 12:

- Identifies and explains the effect of stressors on the quality of life and how to manage these stressors.
- Discusses the importance of building and sustaining positive relationships.

Learning Outcome 2: Responsible Citizenship

The learner is able to demonstrate competence and commitment regarding the values and rights that underpin the constitution in order to practice responsible citizenship and enhance social justice and sustainable living.

Grade 10, 11 and 12

- Knows the characteristics of a democratic structure, how it functions, how it changes and how to act democratically.
- Able to formulate a personal mission statement based on core aspects of personal philosophies, values, beliefs and ideologies which form and direct actions in life.

Learning Outcome 3: Recreation and Physical Well-being

The learner is able to explore and engage responsibly in recreational and physical activities, understanding the relationship between participation and well-being.

Grade 10, 11 and 12

- Able to set own goals, monitor and evaluate own physical fitness programme.
- Participates and practices skills in a variety of games and sport.
- Aware of different career opportunities offered by recreational and fitness industry.
- Plans and participates in outdoor recreational activities which includes leadership aspects.
- Uses administrative and organizational skills.
- Coaches peers and others.
- Able to describe the importance of the relationship between physical fitness and physical, mental and socio-emotional health.

Learning Outcome 4: Career Guidance

The learner is able to demonstrate self-knowledge and the ability to make informed decisions regarding further study, career fields and career pathing.

Grade 10, 11 and 12

- Explores own personal expectations and abilities in relation to various career requirements.
- Reflects on own learning skills, style and strategies and is able to make adjustments to improve.
- Is aware of the career opportunities offered through recreational, outdoor and adventure type programmes.

7.5 Relevance of the NCS concepts to this research

In examining the above Learning Outcomes and their specific Assessment Standards as extracted above it is clear that adventure-based activities provide an alternative method of delivering these outcomes to the learners. However, the emphasis in this study is concerned with the meta-cognitive elements as depicted by the underlined words or phrases. The list of words below has been extracted from the RNCS (Grade R to 9) and the NCS (Grade 10-12) for Life Orientation (DoE, 2002 a and b). These words have been lifted directly out of the assessment standards as contained in each of these documents and in this research are to be regarded as the indicators of meta-cognitive elements.

An assessment standard is defined as the knowledge, skills and values that learners need to show to achieve the Learning Outcome in each grade (NCS document, DoE, 2002b:61). This list of words represents the knowledge, concepts, ideas, skills and values which are required by the assessment standards to be achieved by the learners.

These words, ideas or concepts will be recognized as being directly associated with the concepts that were discussed in chapter five forming the basis of this study. These Life Orientation concepts as contained in the curriculum document are in fact the same meta-cognitive elements that are investigated in this study. In order for learners to become effective self-regulated learners they have to master a range of meta-cognitive abilities. These abilities incorporate skills such as planning, goal setting, self-evaluation, self-motivation, problem solving, decision making, to mention a few, that learners can acquire through practising during appropriate activities and consequently become better self-regulated learners.

The extracted words or concepts are;
Goal setting
Self-planning
Problem solving ability.
Self-reflection
Self-improvement strategies

Self-evaluation
Conflict management
Positive Self-concept formation
Emotional coping
Self-management skills in difficult situations
Self-motivation
Decision making
Coping with change

The concept of Life Orientation captures the essence of what this learning area aims to achieve. It guides and prepares learners for life and its possibilities. Life Orientation is central to the holistic development of learners. It is concerned with the social, personal, intellectual, emotional and physical growth of learners, and the way in which these facets are interrelated. The focus is the development of self-in-society (RNCS, Grade R-9, DoE, 2002a:4). It is the researcher's deduction here that the extracted concepts above are the foundational meta-cognitive facets of the intended National curriculum of Life Orientation.

In chapter six of this study it is clearly pointed out that meta-cognitive skills incorporate a range of 'life skills' or techniques that learners can absorb through practice to become self-regulated learners. One of the aims of this study is to provide evidence to show that engaging in adventure type activities helps to mediate the necessary learning to develop these meta-cognitive skills required by the Life Orientation Curriculum as well as for other learning purposes.

The collection of detailed information is critical for this study in order to show the relevance of adventure education in mediating the learning of these meta-cognitive skills which enhance the self-regulatory capacity of learners. In the RNCS referral is often made to the development of the learner's self-esteem and ensuring that the learner grows in self-confidence. As was pointed out in chapter five, this increased self-belief and feeling of success in a task has tremendous impact on the learner's self-motivation and

consequently task achievement. This research process aims to gather as much evidence from as many sources as possible that involve adventure-based activity programmes in order to allow the evidence to speak for itself in terms of developing self-regulated learners.

7.6 Data Analysis

This study has two components, each with its own data and importance:

- Firstly, the data gathered through an analysis of the human activity during adventure-based activities. This is done within the embedded case studies as learners are engaged in the different activities. The emergent information will show that learners become better self-regulated learners through engaging in adventure-based activities and thereby practicing meta-cognitive strategies or techniques. This research will refer to this data as ***meta-cognitive data*** out of which a proposition will emerge that adventure-based activities mediate learners in becoming better self-regulated learners. Glaser and Strauss propose their grounded theory approach to enable researchers to generate theory (Taylor & Bogdan, 1984:125). The grounded theory approach is a method for discovering theories, concepts, hypotheses, and propositions directly from data, rather that from a priori assumptions, other research, or existing theoretical frameworks (Taylor and Bogdan, 1984:126). The researcher uses Engeström's activity theory both as the theoretical base but also as an analytical tool for this study. The findings from this analysis will enable a proposition to be made regarding the effects of adventure-based experiences on the learning of self-regulatory strategies. Conclusions about this proposition will be made in chapter sixteen of this study.

- Secondly, in the action research component the embedded case studies serve to provide the empirical information that will modify and change the school's Life Orientation curriculum through using adventure-based activities. In this research the data will be referred to as ***formative data*** and will be presented in the form of a case

report (chapter eight) that has culminated out of the data from the learners, parents and educators. The different focus groups would have used this formative data for discussion and to help draw conclusions that have influenced decisions on recommendations for the future curriculum and amendments to the existing practice. McKernan (1996:227) points out that a report must "pay paramount attention to the audience" and "...one must ensure that conclusions are fair and based on careful selection of concepts and indicators".

It must be remembered that in grounded theory researchers do not seek to prove their theories or propositions but merely to demonstrate support for them (Taylor & Bogdan, 1984:126). This research will endeavour to do just that. McKernan (1996:221) makes the point that when one is 'theorizing' one is perceiving, comparing, aggregating, ordering and generally finding connections in the data. Theorizing also includes speculating or making good guesses based on reflexive activity.

7.7 Interpretation of data

The relevant data has been collected over the past two and a half years from a range of sources as indicated below. The meta-cognitive data has been collected and arranged according to an activity theory analysis based on participant observations and video analysis. Part of this data was collected in two ways: firstly through a series of narratives written by grade 8 to 11 learners who have frequently been engaged in adventure activities and secondly by narratives from grade 6 and 7 learners who in many cases experienced adventure activities for the first time.

7.7.1 Narratives

These narratives were thoroughly read, and units of meaning were identified and coded. According to Taylor and Bogdan (1984:136) the coding process is a systematic way of developing and refining interpretations of the data. Miles and Huberman (1984:56) view codes as tags or labels for assigning units of meaning to the information that has been

collected. Codes are usually attached to words, phrases, sentences or whole paragraphs, which are connected to a specific setting. Taylor and Bogdan (1984:137) suggest starting by listing every theme, concept, interpretation and proposition and then collapsing the categories that overlap into units of meaning. This allows a researcher to determine trends or patterns that the data is describing and to compare "pieces" of data relating to the themes or concepts in order to tighten up ideas (Taylor & Bogdan, 1984:138). This is explained in greater detail in chapters ten to thirteen.

In this research the data from the grade 8 to 11 (54 learners in all) was analyzed into ten most common Natural Meaning Units (NMUs) (see page 135), and the content of the narratives was then analyzed into the number of times these NMUs appeared in the narratives in total. Chapters ten, eleven and twelve provide more detail. The same procedure was used to analyze the information in the narratives of the grade 6 (21 learners) and grade 7 (25 learners).

In order to support this quantitative view a qualitative perspective is given through the expressions of some learners' voices in relation to the NMUs. As indicated earlier the importance of voice in the socio-cultural approach to learning is significant. This according to Wertsch (1993:13) who mentions both Bakhtin and Vygotsky (1979) in their belief that human communicative practices give rise to mental functions and therefore are the expressions of the mental functioning of the individual. In the case of this research the voices of these learners are most likely to express their attitude and feelings towards their adventure-based experiences.

7.7.2 Participant observations.

Learners were then observed as they were engaged in doing different adventure activities.

- As they practiced climbing on the equipment at school.
- Actual rock climbing, abseiling and canoeing.
- On survival camp, bridge building and raft building.

- Doing group dynamic activities.
- Competing in the school's annual 55 km eco-challenge race.

The learners were observed in relation to the 'elements' identified in Engeström's activity systems namely, 'subject', 'object', 'tool', 'rule', 'community' and 'division of labour', (Engeström 1987:256). Words, phrases and sentences relating to the NMUs mentioned above, were associated with any of these key 'elements' and were then noted. These were noted in order to follow the 'contradictions' and 'tensions' (see p.87 and pp. 92-95) that occurred which played a part in psychological or physical change or movement to the next level of functioning by the participants. This is explained in more detail in the analysis in chapters ten, twelve and thirteen. The data collected in this way will be primarily meta-cognitive data.

7.7.3 Formative data

"Formative" in this context means informing future decisions in an overall picture, a drawing together of information to gather objective and rich evidence in order to make informed decisions as part of the primary goal and the action research process.

The purpose of the formative data is to determine the overall value of adventure-based activities in the curriculum at Lilyfontein School. This information includes all information gathered from the above process as well as input from parents and teachers. Information from detailed observations and measurements of learners, discussions, focus groups and meetings was used to extract NMUs relating to the value of adventure activities for the school. This information is not included as part of the write up of this research even though the processes of this research have generated the required evidence.

7.8 Reflection on this chapter

This chapter highlights the primary and secondary case studies, the purposes of each and the capturing of relevant data. The **primary case study** is about relevance of adventure-

based activities to the Life Orientation curriculum. This is where formative data is collected and used to make decisions about the future curriculum at Lilyfontein School.

The **secondary case study** is about finding evidence in the embedded cases that adventure-based activities enhance meta-cognitive skills and develop self-regulated learners. This is the meta-cognitive data that is collected. It is this secondary information that provides empirical evidence that meta-cognitive strategies help solve the 'contradictions' that occur between elements in Engeström's activity system during an activity. This leads to Engeström's expansive learning cycle and consequent change enabling self-regulated learning to develop in the learners. This evidence that adventure-based activities enhance self-regulated learning capacity informs the primary case (as mentioned above) where an action research process continues in parallel with the aim of developing the best possible Life Orientation experiences for the learners at Lilyfontein School.

Chapter 8

The part played by action research in this study

In the introduction to this study the researcher points out that although the action research component of this research forms an important part of the research process it has, however, not been reported on in detail in this study. The action research component comprises the underlying information gathered through a variety of techniques during the adventure-based programmes run at Lilyfontein School. This information provides the crucial evidence that has informed the decisions taken by the SGB and the SMT in the school. Minutes of these discussion meetings have not been written up into this research other than as an example in appendix G. Important decisions arising from the discussions have been included in this chapter.

As stated in chapter seven the **primary goal** of this study was to determine the value of the adventure-based programmes used within the Life Orientation Curriculum at Lilyfontein School and whether these adventure-based activities fulfil the National Curriculum requirements. The information emanating from here would be referred to as **formative data** (see page 157) and will inform decisions regarding the future of the Life Orientation Curriculum offered at Lilyfontein.

Evidence to support this goal is generated by a **secondary goal** which aims to establish via empirical evidence, whether adventure-based activities give the learners opportunities to use meta-cognitive strategies when working through the challenges of adventure-based activities. Meta-cognitive strategies (MCS) which include elements like reflective thinking, self-planning, self-monitoring, self-motivation, self-management, emotional management, decision making and problem solving are regarded as very valuable characteristics of being a self-regulated learner. A self-regulated learner has the ability to use meta-cognitive strategies to think about and control one's own learning and cognitive system (Brown, 1987:66). This information for the purpose of this research will be called **meta-cognitive data** (see page 153).

8.1 The action research process

This research takes the form of a 'primary case study' which generates the **formative data** through McKernan's Action Research model collecting data from the embedded units within the larger case study. An empirical approach is used in the 'secondary case study' to find evidence that will support the proposition that adventure-based activities give opportunity to use meta-cognitive strategies and by so doing develop self-regulated learners.

This action research model adopted a tri-cyclic approach that investigates the embedded cases of learners in different grades, educators and parents in their contexts. Various data collecting methods were use, for example: questionnaires, narratives, interviews and in-depth participant observations. As the evidence from the cases emerged so the information was taken to focus groups to discuss and make decisions regarding the way forward. The focus groups were made up of a range of the following stakeholders: (see page 121 and the pilot study report on page 320.)

- Members of the School Governing Body (SGB) (parents and educators)
- Members of the SGB Executive committee (parents and educators)
- The School Management Team (SMT) (Senior Educators)
- The Representative Council of Learners (RCL) (grade 8 to 12 learners)
- A Curriculum Development Committee (CDC) comprising executive committee members as well as SMT members.
- Educators. Full staff meetings on occasions served as focus groups to discuss adventure programmes for the educators' grades. This discussion of adventure activities encompassed aspects like organization, benefits, drawbacks to the curriculum as well as ways to improve current practice.

These focus groups met on more than fifteen occasions for purposes of information sharing, discussion, brain storming, situational management, reinforcement, feedback, decision making, trouble shooting, planning or advising (see page 320). As more information became available so it was put to these committees for debate and decisions.

The decisions would then be taken back to the full staff or the adventure staff for comment or action. It has been this spirit of interaction, sharing of ideas and decision making as well as participative management with remarkable parent involvement that has allowed this adventure component to grow to its current operational level.

8.2 Summary of the research process

Summary of the "Primary Case" to illuminate the research process of the Adventure Programme at Lilyfontein School

ACTION RESEARCH PERIOD	WHAT	HOW	WHO	DECISION
Cycle one: June 2002 to December 2002	Pilot study: Review of current adventure activities (conducted as part of the extra-curricular programme) to determine their value, worth and meaning to teachers, parents and students. Determine possible relevance to departmental curriculum expectations.	Focus groups and informal discussions and interviews. Participant observation during activities and on camps. Interviews with instructors and participants. Study of documents C2005 and RNCS	Staff and School Management Team (SMT). Parents (SGB members). Learners (RCL)	SGB and SMT in favour of trialing an adventure type programme as part of the intra-mural curriculum. Programme to be designed and built into the time table on two days of the week and run by the instructor. Learners would be assessed as part of the Life Orientation LA.
Cycle two : January 2003 to December 2003	Monitoring of the adventure activities run according to an organized programme to determine its value in helping learners become self-regulated learners.	Through narratives written by participants; observations of participants in action; video analysis of participants; questionnaires to teachers and parents for comment; focus group contact with learners in the RCL, staff in SMT and parents in SGB.	Embedded case studies of: # **Learners** as Participants in a 'class' situation as well as participants in a survival camp situation # **Parents** as observers in the home context # **Educators** as observers of students.	Decision to pursue the idea of adventure activities as part of Life Orientation within the time table BUT : # due to staff and time table constraints to reduce programmes to one day a week. # not to continue with the leadership aspect for grade 11s as this takes them away from class to often. # To structure the

				adventure programme into modular form to facilitate the assessment component for portfolios. # Consider developing a programme that could address the discipline aspect in the classes.
Cycle three: January 2004 to September 2004	Assessing the value of the adventure programme. Monitoring the group dynamic and relationship building programmes as tool to address the disciplinary aspect of the learners through co-operative learning features.	Final interviews with # Three educators # Instructors # Four parents. Specific pre and post questionnaire for learners and for educators. Continued in-depth observation of learners in action using video analysis	Complete embedded case study of # Parents # Educators # Learners to collect evidence required to make informed decisions.	Data analyzed and interpreted to inform the SGB and SMT as to the recommendation and adoption of the adventure programme for use as part of the school's curriculum and vision for the future. Included in this programme would be group dynamic activities which would also form part of the Life Orientation programme.

Table 8.1. Illustrates the flow of the action over the research period June 2002 to September 2004.

Information gathered from the embedded cases is put into case reports, but also provides evidence through the analysis of learners' action and interaction and their use of meta-cognitive strategies (MCS) in their challenging situations. All this evidence has been shared with the relevant stakeholders of the school community through executive and SGB meetings, focus groups and informal discussion. The evidence was then used to inform the broader decision making process of the action research over this research cycle from January 2002 to September 2004.

Decisions have been taken on the relevance and place the adventure-based programmes will have in the curriculum offered at Lilyfontein School. The focus group discussions are based on the evidence gathered from the embedded case studies in the form of case reports as well as detailed analysis of actual activities. Proposals have been made to the

School Governing Body (SGB) for decisions to modify the school's curriculum as well as to continue with the extra-curricular activities that have also shown benefit to the learners.

8.3 Final comment and recommendations

The researcher's resources in this study to date have not revealed evidence of other studies conducted on Vygotsky's mediational-means as applied to adventure-based activities. More specifically, this means the extent to which these adventure-based activities provide opportunity for participants to use and practise meta-cognitive strategies (MCS) to deal with the real challenges they encounter in the range of adventure-based activities. Finally, the extent to which these meta-cognitive experiences actually develop self-regulated learners and add value to their learning experience is reflected below:

- The evidence gathered in this study points very favourably to the benefits of including adventure experiences in the Life Orientation programmes of a school.
- The results of this study have motivated and confirmed the decision of this school's SGB and SMT to pursue the inclusion of adventure-based activities in the Life Orientation programmes of the school.
- The SGB and SMT have requested that comprehensive modules relating to adventure-based experiences and activities are designed to contain relevant Learning Outcomes relating to Life Orientation. This may be extended to other Learning Areas or Subjects.
- Very serious consideration and planning must be devoted to the Further Education and Training (FET) curriculum for Life Orientation as this will be a compulsory Learning Area from 2006 (grade ten) in the FET band. Lilyfontein needs to retain its unique adventure-based programmes and attempt to write them into the FET curriculum. A strong submission to the Department of Education for the use of adventure-based activities as a vehicle for achieving the prescribed Learning Outcomes. This study shows clearly the applicability, relevance and validity of adventure activities to the Assessment Standard requirements of the

National Life Orientation Curriculum Statements. The school's Curriculum Committee is currently looking at the possible combinations for the future curriculum at Lilyfontein School.

- One of the challenges of using adventure-based programmes to achieve Life Orientation learning outcomes will be to ensure that the forms of assessment are relevant and are a valid indicator of the Assessment Standards.
- The idea of planning a "Postmatric" programme that would incorporate a range of adventure-based and life skill experiences is also a proposal emanating from this study. This has gone beyond proposal stage where curriculum and infrastructural components are currently being developed with this programme in mind.
- This study has already responded to various other schools who have shown interest in the value of including such adventure-based experiences in a structured and well planned Life Orientation programme.
- Furthermore a recommendation would be made through the newly formed Adventure Recreation Association (ARA) to the Department of Education that they recognize the relevance of adventure-based activities being used to address some of the Life Orientation Learning Outcomes and that the DoE supports the valuable learning experiences that are derived from participation in such adventure-based activities. Furthermore that this adventure-based approach ought to be considered as part of the FET Life Orientation curriculum which will form a compulsory component of the fundamental options of the new subject choice.

At this point it is interesting to note that it has come to the researcher's notice that the Adventure Recreation Association (ARA) in South Africa is planning on making proposals to the Department of Education for the inclusion of adventure-based activities into the Life Orientation curriculum. The findings of this research hopefully will contribute to this further development of adventure-based programmes as part of the Life Orientation curriculum, however, we should take note of Packer and Addison (1989:290) when they say that there is no interpretive method that would lead to a universally acceptable account, one that would be accepted by all sides but that "...a good

interpretive account is one that advances the practical concerns with which we undertake an interpretive inquiry, and one that works well with the other activities we are engaged in" (Packer & Addison, 1989:291).

The researcher in this study is certain that the evidence that has emerged in this research is strong enough to make the claim that adventure-based activities play a significant influence in mediating the learning of self-regulated learners. In order to qualify the claimed relevance of this study to the national curriculum Life Orientation statements in the FET and GET the following chapter will provide a meta-analysis of the meta-cognitive elements contained in these statements.

Chapter 9

Relevance of this study to the National Curriculum Statement expectations.

This chapter gives an in depth analysis of the Life Orientation Learning Area in the Revised National Curriculum Statement (RNCS) in the Senior phase (Grade 7, 8 and 9) of the GET band as well as of the NCS in the FET band (grade 10, 11 and 12). This is done for the purpose of showing the applicability and relevance of this research to the expectations of the National Life Orientation Curriculum Statement and its impact on decisions made by the school's curriculum development committee (CDC).

Outcomes-based education forms the foundation of the curriculum in South Africa. It strives to enable all learners to achieve their maximum ability. It does this by setting the outcomes to be achieved at the end of the process. The outcomes encourage a learner-centred and activity-based approach to education (DOE, 2002b:1). This study aims to seek empirical evidence to support the claim that adventure-based activities offered at Lilyfontein School as part of the Life Orientation curriculum are a justifiable learning experience for the learners; enabling them to achieve some of the required Learning Outcomes of Life Orientation.

Chapter seven provided a basic document analysis of the RNCS (GET) and the NCS (FET) for the Life Orientation curriculum statements to highlight relevant concepts applicable to this study. This chapter goes further in that it identifies the relevant concepts that apply to meta-cognitive strategies and adventure-based programmes that are contained in the statements but makes a more detailed analysis of the Assessment Standards (AS) and the meta-cognitive indicators (MCI) in each statement. This will show the frequency of occurrence of the meta-cognitive strategies embedded in each of the statements and therefore the scope of application of adventure-based activities in the Life Orientation curricula.

9.1 The Critical Outcomes

The Revised National Curriculum Statements (RNCS) for grade R to 9 (GET) as well as the National Curriculum Statements (NCS) for grade 10 to 12 (FET) are built on the critical (COs) and developmental outcomes (DOs) that were inspired by the Constitution and developed in a democratic process (NCS 10 –12,DoE, 2002b:3).

The following critical outcomes (COs) pertinent to this study are those that required learners to be able to:

1. Identify and solve problems and make decisions using critical and creative thinking.
2. Work effectively with others as members of a team, group, organization and community.
3. Organize and manage themselves and their activities responsibly and effectively.
4. Collect, analyze, organize and critically evaluate information
5. Communicate effectively using visual, symbolic or language skills in various modes.

The developmental outcome (DO) of relevance to this study is that learners need to be able to reflect on and explore a variety of strategies to learn more effectively.

On examining more closely these critical and developmental outcomes it becomes clear that the **meta-cognitive strategies** (MCS) as used in this study are also embedded within these statements (underlined). For example, *problem solving and decision making* as written in critical outcome number one. In the second outcome the importance of *working effectively in a group is* highlighted. In the next *self-organisation, self-management, self-evaluation and communication* are apparent whilst the importance of learning strategies is contained in the developmental outcome.

9.2 Life Orientation Learning Outcomes

This study shows the important impact adventure-based programmes can have on the learners. The learners have expressed this feeling very strongly through the narratives they have written and, secondly this is obvious in the participant observation and use of recording and measuring tools to empirically document their performances during different adventure-based activities (evidence can be seen in chapters ten to fourteen). Their experiences show a very strong reliance on meta-cognitive strategies as they progress through the various activities and tasks. It is through these well planned adventure-based activities that many of the Life Orientation Learning Outcomes can be addressed.

However, the purpose of this chapter is to look more closely at the part played by meta-cognitive strategies (MCS) contained in the Revised National Curriculum Statement (RNCS) Grade R to 9 as well as the NCS for Grades 10 to 12, Life Orientation. (Chapter seven also provides an analysis of specific assessment standards, while this chapter focuses more on the senior phase grade 7, 8, 9 as well as the FET grades 10, 11, 12.)

9.3 Concept analysis of the meta-cognitive strategies contained in the Assessment Standards (AS) of the Learning Outcomes (LO)

This study claims that self-regulation is enabled through the learning of meta-cognitive strategies (MCS) which in turn may be practised and learned during adventure-based activities. In the context of this study meta-cognitive strategies or elements refer to the skills and strategies of self-planning, self-monitoring, self-evaluation, emotional coping, problem solving, decision making, reflective thinking as well as the importance of self-motivation and self-esteem in the overall learning process.

The following meta-analysis refers in particular to the Senior Phase, i.e. grades 7, 8 and 9. (RNSC, DoE, 2002a:40-49). Each Learning Outcome (LO) is analysed by extracting indicator words that are signposts for possible meta-cognitive strategies / elements (MCS/MCE) that are embedded in each of its Assessment Standards (AS). In this

research these words or signposts will be referred to as meta-cognitive indicators (MCIs) as they point out the meta-cognitive strategies (MCS)

9.3.1 **Learning Outcome one (LO1) is about Health promotion.** It has fourteen ASs and contains eight meta-cognitive indicators (MCIs).

"...responsible decision making" (decision making)

"...own personal choice" (reflective thinking)

"... examines health and safety issues" (self-evaluation)

"...evaluates the influence of issues on own choice" (self-evaluation)

"... suggests appropriate responses" (problem solving)

"...suggests rehabilitation options" (evaluation, problem solving and decision making)

"...plans an action" (self-planning)

"...applies insights gained" (self-reflection, problem solving)

9.3.2 **LO 2 concerns Social Development.** It has fifteen ASs and contains five MCIs

" ...how to counter gender stereotyping and sexism" (problem solving and decision making).

"...recognition of diverse cultures in activities" (reflective thinking, self-evaluation and problem solving)

"...plans counter strategies to violations of human rights" (problem solving and decision making)

"... using democratic processes when solving a problem" (problem solving)

"...able to reflect on various religions" (self-reflection, self-evaluation, decision making)

9.3.3 **LO 3 promotes Personal Development.** It has eighteen ASs with fourteen MCIs.

"...enhance own and others' self image through positive actions" (problem solving, decision making, self-evaluation)

"...evaluate own coping with emotions and responding to change" (emotional coping strategies, decision making, self-monitoring)

"...reflects on decision making skills" (self-reflection, decision making)

"...evaluates own study skill strategies" (self-planning, self-evaluation, decision making)

"...self-concept formation and self motivation" (self-evaluation, emotional coping, self-reflection, self-motivation)

"... reflects on appropriate behaviour" (self-reflection, self-evaluation, decision making, self-management)

"...Copes with depression, crisis or trauma" (self-reflection, problem solving, emotional coping)

"...implements a personal plan for managing stress" (self-evaluation, self-motivation, problem solving, emotional coping, decision making)

"...draws up an action plan for problem solving personal issues" (self-evaluation, self-monitoring, decision making, self-planning)

"...reflects on positive personal qualities" (self-evaluation, self-monitoring, self-motivation)

"...responds to emotions appropriately" (emotional coping, self-evaluation, problem solving)

"...critically reflects on own behaviour" (problem solving, self-evaluation, self-monitoring)

"...applies goal-setting and decision making strategies" (self-planning, self-evaluation, self-monitoring)

"... critically evaluates own application of problem solving skills in a challenging situation" (Problem solving, self-evaluation, self-monitoring, decision making)

9.3.4 **LO 4 is about Physical development.** It contains seventeen AS's and sixteen MCIs

In this LO a double benefit is apparent in that:

- Almost all of these ASs which are physical in nature can be attained through adventure-based activities.
- Meta-cognitive strategies MCS) are embedded in many of the ASs.

"...participates in an outdoor adventure programme through orienteering in different environments"

"...performs a sequence of physical activities including rotation, elevation and balance movements"

"...participates in and reports on a fitness programme"

"...investigates fair play in a variety of athletic and sport activities"

"...plans and participates in an adventurous recreational outdoor activity"

"...takes part in a programme to improve techniques of rotation, balance and elevation"

"...participates in fitness programmes"

"...designs and plays target games"

"...investigates and reports on gender equity issues in sport"

"...participates and evaluate own performance in adventurous recreational outdoor activities"

"...refines and improves on own and others rotation, balance and elevation movements"

"....sets own goals for physical wellness and improvement"

"...critically evaluates and executes a game plan for individual or team sport"

"...reports on sport ethics"

9.3.5 **LO 5 is about the Orientation to the world of work.** It contains fifteen ASs and ten MCIs

The rationale for this Learning Outcome is that the learner will be able to make informed decisions about further study and career choices (RNCS, DoE, 2002a:48). In the case of this Learning Outcome (LO5) all of its ASs could be applicable through adventure-based programmes either directly or indirectly. This would depend on the emphasis in the design of the programmes.

Examples of meta-cognitive elements that have been extracted from the Learning Outcomes' Assessment Standards in the Life Orientation curriculum are: *Goal setting, Self-planning, Problem-solving ability, Self-reflection, Self-improvement strategies, Self-evaluation, Conflict management, Positive Self-concept formation, Emotional coping, Self-management skills in difficult situations, Self-motivation, Decision making, Coping with change.*

9.4 Number of occurrences of meta-cognitive strategies in the Assessment Standards of the Life Orientation curriculum statement

The table and graph below in Table 9.1 and Figure 9(a) illustrate the number of possible Assessment Standards and the number of ASs that actually contain evidence of a meta-cognitive indicators (MCI). The MCI show the presence of a meta-cognitive strategy (MCS) which may well be included in a well designed adventure-based programme.

Learning Outcome	No of Assessment Standards (AS)	No of AS's that contain meta-cognitive strategies.	Percentage occurrence and possible use of MCS through adventure activities.
LO1: Health Promotion	14	07	50%
LO2: Social Development	15	07	46%
LO3: Personal Development	18	14	77%
LO4: Physical Development	17	16	94%
LO5: Orientation of the world of work	15	10 (directly) 15 (indirectly)	66% 100%

Table 9.1. Frequency of occurrences of meta-cognitive strategies in the Senior Phase Life Orientation Learning Outcomes and Assessment Standards.

The graph below illustrates the information from the above table 9.1.

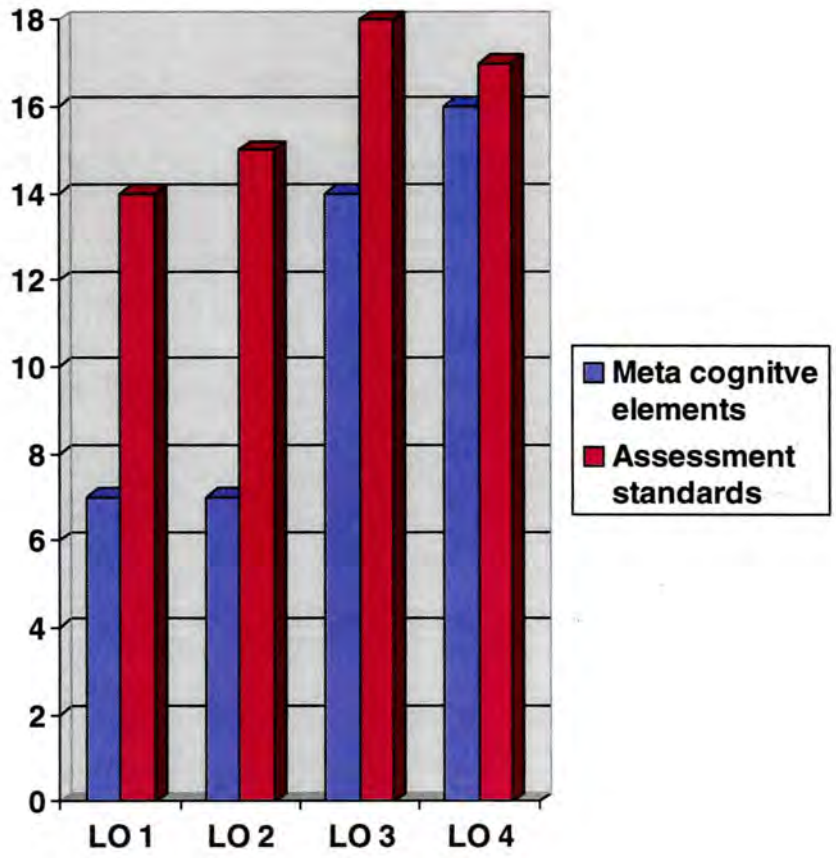


Figure 9(a). The meta-cognitive elements contained in the Grade 7 to 9 RNCS Assessment Standards of four of the Learning Outcomes.

LO = Learning Outcomes : AS = Assessment Standards

LO 1 = Health promotion (7 Assessment Standards contain MCS out of 14 ASs)

LO 2 = Social development (7 ASs contain MCS out of a possible 15 ASs)

LO 3 = Personal development (14 ASs contain MCS out of a possible18 ASs

LO 4 = Physical development (16 ASs contain MCS out of a possible 17 ASs)

9.5 The Further Education and Training (FET) band

A similar analysis of the Assessment Standards in grades10, 11 and 12 are illustrated in Table 9.2 below and graphically in figure 9(b) on the following page.

Learning Outcome	No of Assessment Standards (AS)	No of AS's that contain meta-cognitive strategies.	Percentage occurrence and possible use through adventure activities.
LO1: Personal Well being	11	09	81%
LO2: Responsible citizenship	15	08	53%
LO3: Recreation and Physical well being	13	11	84%
LO4: Career Guidance	13	06	46%

Table 9.2. Shows how often meta-cognitive strategies occur in the Assessment Standards of the Learning Outcomes of the grades 10, 11 and 12 Life Orientation Curriculum Statement.

The graph below illustrates the information from the above table 9.2.

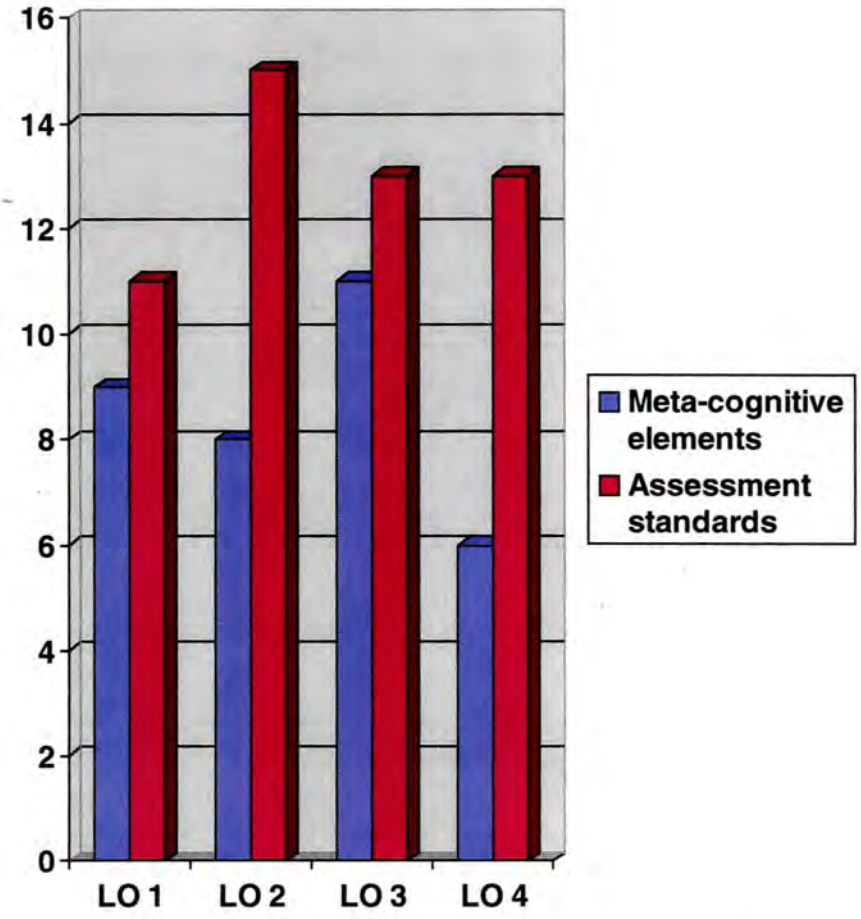


Figure 9(b). Illustration of the meta-cognitive strategies contained in the Assessment Standards of the Learning Outcomes in the FET band.

LO = Learning Outcomes : AS = Assessment Standards

LO 1 = Personal well being (9 AS's contain MCS out of a possible 11 AS's) = 81%

LO 2 = Responsible citizenship (8 AS's out of a possible 15 AS's) = 53%

LO 3 = Recreation and physical well being (11AS's out of 13 AS's = 84%)

LO 4 = Career guidance (6 AS's out of 13 AS's) = 46%

9.6 Reflections on this chapter

This chapter's analysis reveals that meta-cognitive strategies as defined and used in this research occur in all of the Assessment Standards of the prescribed Learning Outcomes and range in occurrence from a possible 100% down to 46%. How these meta-cognitive strategies (MCS) or skills manifest themselves in the context of adventure-based activities would depend on the design and content of the adventure activities at each learning site or school. Such designs would depend on the context of any school as well as the available personnel, physical resources and equipment. An adventure-based programme is not totally dependent on sophisticated or expensive equipment and a reasonable number of activities can be done through the creative use of the immediate environment. The following chapters ten to fourteen explore the meta-cognitive data that has emerged from the narratives and in-depth interviews that provide the evidence to support the questions asked in this study. Chapter sixteen will then explore conclusions and recommendations emanating from the findings of this research.

Chapter 10

Evidence and discussion of the meta-cognitive strategies emanating from the learners' perceptions of adventure-based experiences.

This chapter looks at the meta-cognitive data generated by the research in this study that provides evidence to support the intended goal of Lilyfontein School's curriculum. This data from the narratives will only be related to activity theory in its broad context. Chapters twelve and thirteen use activity theory to analyze in more detail the specific activities which form the overall nature of the adventure-based activity programme.

The goal of introducing adventure-based activities into the school curriculum at Lilyfontein is to develop certain meta-cognitive strategies (MCS) in the learners so that they become more self-confident, self-reliant, independent thinkers, problem solvers, solution seekers and good decision makers. A secondary goal is to develop the capacity of learners to cope with emotional aspects like fear, anxiety and conflict situations. In order to achieve this multi-faceted goal a variety of adventure-based activities are offered to the learners. The adventure activities allow learners to engage interactively (with peers, educators or leaders), physically, intellectually and emotionally with the rigours of the tasks at hand to work towards an outcome. Thus according to Henderson and Cunningham (1994:256) "...it is through culturally constituted interaction with others ... that individuals develop the higher order mental functions required in the performance of organized, planful action ... Vygotsky's conception of higher mental functions would include self-regulation in a sense that is compatible with Zimmerman's (1989) notion of self-regulation as active participation, at meta-cognitive, motivational, and behavioral levels, in one's own learning processes."

As this research points out in chapter five (p.87) the significance of Vygotsky's concept of the Zone of Proximal Development (ZPD) in learning is very relevant in the context of adventure activities. A very important component of adventure activities with a high risk factor is for leaders, instructors or even peers to guide, encourage or 'talk' people through

the task to ensure a positive outcome and sense of achievement which leads to self confidence and self-reliance.

> Classroom practices that make effective use of sociocultural principles structure occasions for interactions in which, under the sensitive guidance of a teacher who provides scaffolded instruction, students are able to accomplish tasks beyond their capabilities as individuals. The role of the teachers or other agents of socialization is not, in this view to "transmit" knowledge to the student. Rather, knowledge is assumed to be co-constructed by students and the teachers as participants in joint productive activities. The outcomes of co-construction are assumed to include the ability to guide one's own learning independently. (Henderson & Cunningham ,1994:277).

Vygotsky's meta-cognitive aspects and the meta-cognitive strategies (MCS) referred to in this study are borne out by the following narratives of learners who have been engaged in adventure-based activities at different levels.

10.1 Narratives of the grade 8 to 11 learners

At the level of grade 8 to 11 most of the learners have had prior or in some cases frequent experience in these activities. The learners were asked to respond to the question below:

- Describe why doing adventure activities has been of value to you.

It is important to note that the learners were only given the instructional statement to respond to; no influencing descriptions were provided by the researcher. The total number of respondents was 54. The narratives of each learner were analyzed in detail in order to look for words, phrases, sentences or paragraphs describing themes, ideas or concepts relating to meta-cognitive aspects, as required to be a self-regulated learner according to Zimmerman (1994).

Engeström's mediational triangle incorporates the tool as a means to mediating learning. As Leont'ev argues, tools have a central role in the theory of activity, for the tool mediates activity and thus connects humans not only with the world of objects but also with other people (Halliday, 1994, as cited in Wells,1999:5). Furthermore, he argues, that as a semiotic tool language is admirably organized for this purpose and one of the

"ideational" meta-functions is to encode the aspect of experience. Wertsch (1993:29-30) points out the importance of Vygotsky's notion of 'psychological tools' and also Bakhtin's (1981) claim that aspects of human functioning are fundamentally tied to communicative processes (Wertsch, 1993:13). In view of the strong support of the argument that words, text or speech reflect the attitudes and beliefs of a speaker, the researcher believes that the "participants' voices" that follow provide strong evidence of the impact that adventure experiences have on the learners.

The researcher has categorized the narratives by identifying Natural Meaning Units (NMUs), (see page 135 for explanation) with meta-cognitive significance in the voices of the participants and then placing the narrative in the relevant NMU or meta-cognitive domain. In should be noted that although a high percentage of meta-cognitive elements occur in the NMUs, some may not be regarded as meta-cognitive elements.

10.2 Voices of learner's narratives relating to NMUs

It is important to note that the researcher has not edited the voices but has chosen to transcribe the actual writings of the participant.

10.2.1 Voices related to Emotional control

(i) A: 14 year old girl

For me choosing adventure education was scary as I didn't know what I was signing up for, but after the rock climbing that we did I realized what I would have missed if I hadn't taken that risk. Being on the rock so high up in the air with my life in someone else's hand thinking where to go next and knowing I could plunge to my death made me more excited than I had ever been, it made me feel more alive than I had been in my whole life and I could live that moment over and over again.

(ii) P: 16 year old girl

Adventure experiences has made me more 'wise'. I don't do foolish things purposefully anymore. It has also taught me how to control my emotions because I used to cry if I couldn't do something.

(iii) S: 15 year old girl

Personally adventure education has changed my life. We've been rock climbing and I am afraid of heights. I decided that I hadn't come all that way for nothing. So I took a chance. I did what I new I thought I would do. I climbed 30 metres ! I have two fears. I am afraid of heights and the unknown. To my friends I appear crazy but I prefer to stay with what I know. But adventure experiences have taught me to overcome my fears. It helped me to take hold of my life and to say "I can" – "Carpe Diem !" And my moment came when I climbed that face ! But more than that it taught me about myself, things that I didn't know.

(iv) K: Grade 11 girl

Adventure education has been one of the most exciting events of my life it has been like living on the edge of the world where I have to overcome my fear. Having the fear of heights was one of my problems but my team mates helped me get over that fear when I was rock climbing.

(v) A: Grade 11 girl

I think we benefit tremendously from the adventure activities at school. Not only physically and mentally but it emotionally balances our lives. Adventure also gives us a chance to overcome our fears and take our minds off the bad things most teenagers have to face. Adventure helps build character and also creates responsibility because of the danger of the activities. It has definitely changed my life and will change the life of many in the future.

(vi) S: Grade 11 girl

The equestrian camp, which was part of the adventure side of the school, was quite exciting for me. We had to conquer our fears by climbing on those big horses and it turned out to be quite nice.

10.2.2 Voices related to self-confidence and self-belief

(i) N: Grade 11 girl

Adventure experiences can get our happy juices flowing and can boost our self-esteem. e.g. If there is an activity to be done by a group and one individual has low self esteem ands thinks he/she can't complete the task, the fellow pupils can cheer them on to push themselves to complete it.

(ii) S: Grade 8 boy

I think that it's (adventure activities) a good thing, because its there to overcome fears and doubts. It also is a good way of building up our self esteem. Adventure has improved my confidence and my life by taking on a challenge and conquering my fears by changing the way I think about my abilities.

(iii) G: Grade 9 boy

The adventure has made me enjoy the challenges in life. My achievement in the hike made me feel good about myself, it made me confident and that I could achieve anything that's challenging.

(iv) Y: Grade 9 girl

In my life I've based my one guide to the word P.U.S.H. which stands for persevere until something happens and adventure sports has made me understand what this really means.

(v) J: Grade 9 boy

I am now more sure of myself about going on outings and not being scared about falling off into the water on boating trips. I am now more confident in these situations and can help others as I know what to do.

(vi) R: Grade 9 girl

I have no confidence in myself, so being able to complete such a task (15 km hike) was a great thing because I proved not to anyone else, but myself that there is something in this world I can do !

10.2.3 Voices related to goals setting, planning and preparation for tasks

(i) N: Grade 9 boy

The adventure programme this year for us is hiking and it has done a lot for me. It has made me realize that it's your attitude towards it that will make you fail. If you don't plan properly with your clothes or good equipment and also your food or packing your backpack properly because of a bad attitude then you will not enjoy the hike. Then you will say that hiking sucks but it's you that's the culprit. That also includes your school work, if you have a very bad attitude towards the subject or teacher most of the time you will do badly in that subject. That's why on the next hike I will make sure I've got every equipment needed.

(ii) M: Grade 8 boy

My experience in adventure leadership has taught me a lot like never give up and also the fact that nothing in impossible if you set your goals right you could achieve anything especially if you have someone who is counting on you. So adventure has taught me three things never give up, everything is possible if you give 100% and there's a reward at the finish line.

(iii) N: Grade 11 girl

When I arrived at the equestrian camp I was scared of horses and didn't trust them. By the end of the day I could ride a horse on my own, without help. Knowing this has opened up other opportunities for me as I now know I am capable. I also learned the importance of looking after the horses and being well prepared for the day's riding.

10.2.4 Voices related to problem solving, decision making and coping in stressful situations.

(i) T: Grade 11 girl

I am a completely different person after my trip down the Orange River. You really get to learn about people, friends and teachers and how much you can learn outside the classroom. I have grown in knowledge and learnt to cope in a bad situation.

(ii) B: Grade 11 girl

Doing obstacle courses and leading a group at "Camp Bushpig" gave me great confidence and has begun my understanding on how to handle dangerous situations with younger children. It has helped me with big group functions like the Matric Dance, who we can rely on and who we can trust.

(iii) K: Grade 11 girl

Adventure leadership has also helped me to overcome obstacles, e.g. our cross country, the hexigon, white water rafting, abseiling has had a huge effect on my personality and had taught me how to handle difficult or even dangerous situations as well.

(iv) S: Grade 11 girl

We had to solve challenging problems together and we split into teams and were told to build rafts to carry the whole team to the other side of the dam. If you do not work

together as a team you will not do well. We had to learn to make good decisions as a group.

(v) L: Grade 9 boy

These hikes have helped me discover a hidden talent of mine problem solving and solution finding which has helped me in many things like school work and personal dilemmas. It has also helped me unlock closed doors and lock old ones.

(vi) S: Grade 9 girl

It (adventure activities) helps you clear your mind and helps you keep on going and you realize that you have to make decisions on your own just in case something happens and you don't have anybody around you to help you, it really helps you to make decisions especially when you are hanging 30 meters above the ground.

10.2.5 Voices related to leadership, trust and people related aspects

(i) K: Grade 8 girl

Some of us think that the adventure sport is only for white people because they are good at adventure sports. My conclusion is that black people don't want to do adventure sports because it's scary and you might die. To me you must learn to do something you can't just do it adventure helps you with leadership skills like a leader in school or president of South Africa. If you want to can do things with adventure experience like find a brilliant job.

(ii) B: Grade 8 boy

My goal when I am in grade 10, I just wanna be like Dean because he is a great boy to me he has changed since he started doing adventure sports. Dean is now a leader of this College and I am proud of him. I didn't think Dean was gonna be a leader because he was a teaser and bullying the small kids and now he is the one who is the leader now and I just want to be like him because he is a great boy in the school.

(iii) D: Grade 11 boy

I think adventure leadership training is really helping, maybe not for all of us but only those that participate in the training. I know this for a fact cause it changed my life, cause last year I was against everything and everyone, but now I have to be like a teacher I see everything from a different point of view and now know I'm not always right. I realize that not doing your work and not listening to the teachers you are just shooting yourself in the foot.

(iv) B: Grade 8 boy

I love adventure education. It makes me learn hard because what you learn your life depends on it. When we went rock climbing it taught me to trust other people more. When you are climbing you have to trust your belayer because he has your life in his hands.

10.3 Analysis of the Natural Meaning Units (NMUs).

The analysis of this data revealed ten Natural Meaning Units (NMUs: see page 135 for theory on NMUs) and within these categories elements relating to the NMU were identified and also recorded. The NMUs reflect the voices of the participants in the narratives.

In order to determine the frequency of occurrence at which these NMUs and their elements were voiced by the learners, the relative words were coded and counted as a function of the 54 respondents. The NMUs and their elements are detailed in table 10.1. below:

Natural Meaning Unit	Elements of the NMU/ meta-cognitive elements	Rate of occurrence
1. EMOTIONAL ASPECTS	1.1. Coping with fear / mental toughness	40 times
	1.2. Self-discipline and control of emotions.	14 times
	1.3. Trusting others	10 times
2. SELF-CONFIDENCE	2.1. Self-confidence, self belief and self-reliance.	37 times
	2.2. Courage to do things and take on a challenge	17 times
	2.3. Sense of achievement and positive attitude towards one self	9 times
3. GOAL SETTING	3.1. Goal setting, planning and preparation for a task.	15 times
	3.2. Problem solving and decision making	14 times
4. SELF-REFLECTION AND COMMUNICATION	4.1. Thinking about own performance (Self-evaluate) and how to improve	26 times
	4.2. Communicating with each other	11 times
5. COGNITIVE AND PRACTICAL LEARNING	5.1. Learning about one self, environment and equipment (artifacts)	17 times
	5.2. Learning about fitness, skills, endurance	15 times
6. ENJOYMENT AND FUN	6.1. Relaxing, fun and take mind off academic work	22 times
7. TEAM WORK	7.1 Working together to achieve a goal	12 times
	7.2. Encouraging others to complete a task and achieve success	11 times
8. LEADERSHIP ASPECTS	8.1. Learning and thinking about leadership	9 times
9. UNIQUENESS OF THE SCHOOL	9.1. Regard the school as unique and therefore are proud to be part of it	15 times
10 . NEGATIVE ASPECTS	10.1. Negative feelings towards the participation in adventure activities.	6 times

Table 10.1. Frequency of occurrence of the Natural Meaning Units (NMU's / meta-cognitive elements)

Table 10.1. above reveals a high occurrence of words or voice relating to:

- Coping with fear and emotions (40 times)
- Aspects of self-confidence (37 times)
- Thinking about own performance / self-evaluation (26 times)

- Fun and enjoyment (22 times)

At this point it is important to note that the above summary reveals the elements of coping with fear, emotional control, self-confidence, self-evaluation and reflective thinking which in fact are meta-cognitive elements that were contained in the voices of the participants. These elements were not solicited from the learners and therefore must reflect their beliefs and feeling about adventure-based activities.

10.4 Narratives of the grade 6 learners after their adventure camp

After the grade 6 camp learners were asked to write a narrative on their experiences. These narratives were also analyzed into NMUs. The writings of the participants have not been edited.

10.4.1 Some examples of learners' voices on this camp are provided below

(i) C: Grade 6 girl

The very first time I went on a high wire I was scared but after I had gone all I wanted to do was go again. Adventure sport helped me overcome my fears such as fears for heights. When I see people do the things I see their faces just light up when they realize they can do it.

(ii) K: Grade 6 girl

Camps are good for us because sometimes we live in shacks (e.g. Beach combers) and that teaches us how some people live.

(iii) G: Grade 6 girl

During our Beach combers camp I learned to get on with other people even though I never usually got along with them.

(iv) S: Grade 6 girl

I chose to do abseiling and when I got to the top I was shaking and did not want to look down but I did ! And that has made me see things from a different point of view, e.g. life is like abseiling we are scared to try but when we reach our mountain top we look down and say what a beautiful view, what was all the fuss? Which is why we need more experiences like this.

(v) J: Grade 6 boy

I think adventure activities are important because it teaches us about team work and about our environment and we need to care for our environment because without it we would not survive. It has also helped me to be confident and overcome my fears.

10.4.2 Analysis of grade 6 NMUs

The emphasis at this age level is different as is illustrated by table 10.2.below.

Natural Meaning Units	Elements of the NMU's	No of occurrences
1. Self-confidence	1.1. Being able to rely on oneself and be independent and have a feeling of achievement	12 times
2. About people	2.1. Getting to know people and learning to trust them	12 times
3. Overcoming fears	3.1. Facing fears and overcoming them	11 times
4. Team work	4.1. Working together and cooperating to accomplish goals	9 times
5. Enjoyment and fun		8 times
6. Fitness	6.1. Making one fit and developing skills	5 times
7. Planning	7.1. Planning things so that tasks are accomplished	3 times
8. Negative experience	8.1. Feelings of negativity or not coping	0 times
9. Uniqueness of school		10 times

Table 10.2. Occurrences of NMUs in grade 6 (The total number of respondents in grade 6 was 21).

10.5 Narratives of the grade 7 learners after their adventure camp

These narratives were also organized into NMUs and the number of occurrences were recorded in table 10.4. below. Again the writings of the participants are recorded unedited.

10.5.1 Voices of the learners on the grade 7 camp

(i) P: Grade 7 girl

Mr V told us something he told us that if you run away from a problem it will get bigger every time you run away from it, so that really changed my mind and when I got to the bottom of the cliff I realized I had conquered my fear of heights and that really helped me to realize that face your fears whilst you still can.

(ii) S: Grade 7 girl

I was very scared when I went there to abseil but when I finished I felt better than I was before.

(iii) A: Grade 7 girl

I climbed the cliff which I thought I couldn't climb but I was told I had to try after that I felt so inspired that only if you believe in yourself you can do anything. If you face your small problems with help from someone it makes easier and it gives you confidence to try the bigger problems.

(iv) N: Grade 7 boy

And when we paddled to the mouth of the river some thought it was too far but it wasn't that bad that taught us to be confident and carry on. I was very scared of deep rivers because of the stories about drowning but I understand now that you can do things if you have more knowledge and skills for say paddling or abseiling.

(v) M: Grade 7 boy

If you just keep on running away from things like abseiling your whole life and once oyu have done that and have overcome your fears you will feel good about yourself and be able to tell other people what you did. And yes some things were hard and challenging but that is just showing you a piece of the real world and if you do not face your fears you will never so that is what things like abseiling, sky diving and rock climbing teach you to do and later in life it will help you face some of life's most difficult challenges.

(vi) C: Grade 7 boy

The first time that I got inside the water I was very scared because I don't know whether this boat will tip or not but in the other side I had a feeling that if the boat tips Mr V is there to save me. This is good for those people who are scared of water and they can then get used to it for ever.

(vii) S: Grade 7 girl

We went paddling and my stomach muscles, my shoulder and my back started paining but my friend and I spoke to each other and we encouraged each other to not give up and that's what they were teaching us.

(viii) A: Grade 7 girl

I didn't conquer anything just aches and pains and we woke up early in the morning and walked for hours but didn't really go anywhere.

The NMUs in the above narratives are recorded in the table below.

Natural Meaning Units	Elements of the NMU's	No of occurrences
1. Facing fears	1.1. Facing and overcoming fears and challenges	19 times
2. Self confidence	2.1. Feeling of self-confidence and sense of achievement.	18 times
3. Cognitive learning	3.1. Learning about the environment or about skills and improving; artifacts relating to the paddling experiences.	13 times
4. Fun and enjoyment.	4.1. Being relaxed and enjoying the experience	7 times
5. Team work	5.1. Working together to accomplish something	3 times
6. Trust	6.1. Learning about trust	3 times.
7. Negative responses	7.1. Any form of negativity or bad learning experience	2 times
8. Uniqueness of school		12 times

Table 10.3. This analysis of grade 7 NMUs consisted of 25 respondents

10.6 Summary of the learners' narratives expressing their learning experiences

The narratives thus far provide a detailed description of learners' experiences in adventure-based education. Consideration needs to be given to the range of age group and consequent capacity to express themselves. However, in keeping with the socio-cultural approach to learning that through words and voice certain distinctive themes emerge, it could be argued that the repetitive nature of similar accounts by the respondents could be boring, simplistic and even mundane, but the very purpose of this study is to develop

concepts and theoretical propositions to work towards interpretation and theory. This is in keeping with Taylor and Bogdan's (1984:133) view:

> It is through concepts and propositions that the researcher moves from description to interpretation and theory. Concepts are abstract ideas generalized from empirical facts. In qualitative research concepts are sensitizing instruments and according to Blumer provides a general sense of reference and directions along which to look. (Taylor & Bogdan, 1984:133)

The idea behind this approach is for the researcher to present a meaningful picture that will provide the grounded data to develop meaningful propositions and theory with regard to what is learned through adventure-based experiences or education. In listening to the voices of the learners, we become aware of the similar mind-sets or ideas that the learners have expressed in narrative form. The table below summarizes the most frequently used content of the learners' narratives. This surely then must reflect the learners interpretations of their most common benefits or learning experiences derived from adventure-based activities as conducted at Lilyfontein School. This we ought to be able to accept as an expression of the learners' value of, and consequently their attitude towards, these adventure-based learning experiences.

Table 10.4. below shows the overall number of occurrences of words, phrases or sentences by grade 6 to 11 learners which are related to adventure-based experiences. These are expressed in Natural Meaning Units (NMUs) and contain a high percentage of meta-cognitive strategies.

	Frequency of occurrences in grades 6 to 11			
NATURAL MEANING UNITS	G 8 to 11 54 Respon	Grade 7 25 Respon	Grade 6 21 Respon	TOTAL 100 Respon
1.Emotional aspects: control of fear, emotional control, self-discipline, trust.	64 times	22 times	11 times	97 times
2. Self: Self-confidence, self-belief, courage to do things and take on a challenge, achievement	62 times	18 times	12 times	92 times
3. Cognitive learning: thinking about self, the environment, the way you do things, equipment, fitness, skills, planning to do things, how to improve on doing things	69 times	13 times	3 times	84 times
4. Team work, dealing with, encouraging and helping people	23 times	3 times	21 times	47 times
5. Enjoyment and fun	22 times	7 times	8 times	37 times
6. Goal setting, planning, problem solving and decision making	29 times	3 times	Nil	32 times
7. Fitness	5 times	Nil	5 times	10 times
8. Leadership	9 times	Nil	Nil	9 times
9. Negative feeling towards adventure experiences	6 times	2 times	Nil	8 times

Table 10.4. Frequency of occurrence of Natural Meaning Units (NMUs) in all grades, 6 to 11.

10.7. Relevance of the NMUs to meta-cognitive strategies (MCS)

In the context of this research the Natural Meaning Unit's (see NMUs p. 135) are representative of the words, phrases or concepts expressed by the learners in their narratives which is in keeping with the phenomenological practice of interpreting or making meaning of an action. Vygotsky referred to language as the "tool of tools" (Wells, 1999:7) as language not only functions as a mediator of social activity, by enabling participants to plan, co-ordinate and review their actions through external speech, but also provides the tool that mediates the associated mental activities in the internal discourse of inner speech. The NMUs in this study are the signs and symbols

expressing the thinking and learning of the learners as related to their experiences of adventure-based activities. This notion is supported by Wertsch's (1993:30) point of the significant relationship between words, language and different forms of thinking. According to Kozulin (1998:160), psychological tools which are forms of language symbols like writing, graphs and formulae are essential for the acquisition of the most general formal learning skills. In this case the NMUs reflect these symbols.

These devices [NMUs] are not arbitrary but reflect objective socio-cultural practices that lead to the formation of a given field of knowledge and understanding (Kozulin, 1998:161). Within these NMUs, as indicated above, certain meta-cognitive elements (MCE) have been identified which match up with the meta-cognitive strategies (MCS) described in this study as extracted from the curriculum statements and listed in chapters seven and nine.

Looking at the above table (table 10.4, p.190) points 1, 2, 3 and 6 contain meta-cognitive strategies that learners in grade 6 to 11 feel they encounter and learn during adventure-based activities. These four points will be represented in a graph below, figure 10(a).

The researcher is confident that the NMUs give an accurate indication of the learners' use and application of meta-cognitive strategies (MCS) through the mediational means of adventure-based activities.

10.8 Graphical representation of the meta-cognitive elements in the NMUs.

In order to give a pictorial view of the frequency of occurrences of meta-cognitive elements, the researcher is showing each element as a percentage of the overall number of responses in the four areas: 1, 2, 3 and 6, as defined in the table 10.4.

Figure 10(a) below gives a graphical view to illustrate the frequency of occurrence of the meta-cognitive strategies as they occur in the learners' voices (NMUs) which are a reflection of the learners' perceptions of their experiences of adventure-based activities.

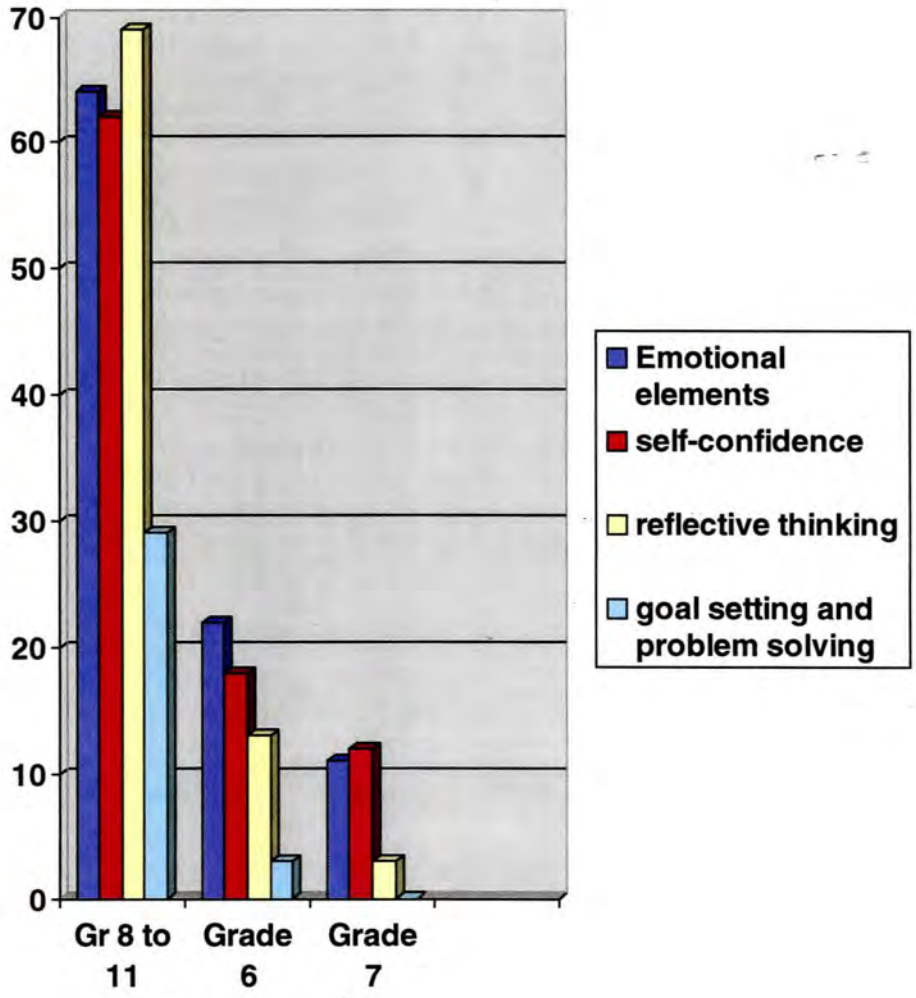


Figure 10(a). Comparative rates of meta-cognitive strategies mentioned in the NMUs of all grades 6 to 11. These meta-cognitive strategies are: (1) emotional aspects, (2) self-confidence, (3) reflective thinking and (6) goal-setting/problem solving/decision making.

10.8 Reflection of this chapter

This chapter allows the participants in adventure-based activities to give voice to their experiences and in so doing establish through words the value and learning they attribute to their adventure experiences. Clearly the evidence shows a high degree of meta-cognitive use by participants during these activities. At no time were the learners prompted to give particular words or ideas and therefore the *Trustworthiness* (Rossman & Rallis, 1998), *Credibility* (Robson, 1993) and *Applicability* of this research evidence must substantially validate the support for the proposition in this research: the proposition that adventure-based activities encourage the use of meta-cognitive strategies (MCS) that help to mediate (develop) self-regulated learning.

Most activities are directed at the achievement of goals. Activity theory uses the term 'object' to refer to the goal at which an activity is directed and 'outcome' as the final achievement of the object. 'Subjects' involved in the activity do not necessarily share a common understanding of the goals. This as Engeström (1987) says may well lead to contradictions and consequent tensions. It is these contradictions and the resultant mediated learning which occurs through the 'tools', 'rules', 'community' or 'division of labour' that promotes change and movement forward of the individual and consequently the institution or system. Michael Cole (1999) reminds us that individuals and the social milieus of which they are a part constitute mutual interacting elements of a single system.

Chapter 11

Findings and discussion related to responses from parents and teachers of the learners engaged in adventure-based activities at school.

One of the types of triangulation in research is the collection of information and data in various settings. This research uses different settings and in this case the data is collected in the following ways:

- through the use of parent observation in their social context
- from educators who interact with the learners in the class room context.

11.1 Responses from parents.

Parents were asked to respond to the following question in writing:

What observations of your child at home could be attributed to adventure activities and why do you think this?

Two sets of parent samples were used:

11.1.1 Parents whose children attend grade 8 to 11 (ages 14 to 17 years) and
11.1.2 Parents whose children attend grade 6 and 7 (± 11 to 13 years)

11.1.1 Responses from the parents of grade 8 to 11 learners,

In order to give a broad overview, the researcher has chosen to present the information of 39 respondents of the sample (11.1.1) in collage format. This has been done by selecting key words or phrases that best capture the essence of the observation made by the parent. This is in keeping with the Vygotskian and socio-historical (cultural) notion that forms of speech are related to forms of thinking and activity (Wertsch, 1993:30). It is important to note here that Engeström's (1993) activity theory lays great importance on the influence of psychological tools and signs (language) on human activity. Therefore parent

observations of their children's change in behaviour and or characteristics may well be expressed in terms of the language they use. This approach is also in keeping with the interpretivist approach to research investigation. This research intends using this feedback in the form of written language that ought to serve as a reliable indicator of the impact that adventure-based activities have on the learners (their children).

Parents are well aware of the use of adventure-based activities within the curriculum as this has been discussed at School Governing Body level, and parent meetings have been convened to explain the rationale and the curriculum link to the Learning Area, Life Orientation. Parents have also been requested to be part of the ongoing feedback (action research process) which is required so that the delivery of the adventure programmes is monitored regularly.

Table 11.1. below is a collage of the parents' responses to their observations of their children in the home context and how they think their children have benefited from doing adventure-based activities at school. The thirty nine respondents in all are the parents of grade 8 to 11 learners. Their responses have been reported verbatim as they expressed themselves in their writings. There is no hierarchy of importance, but table 11.2. shows an overview of the most commonly perceived attributes that parents think that their children have learned from adventure-based experiences.

Parents were asked to respond to the following question.

What observations of your child at home could be attributed to adventure-based activities and why do you think this?

1. Determined to overcome weaknesses.	2. Improved self-esteem.	3. More patient and improved attitude.	4.Considers the effect of his actions on the family.	5. A sense of self-worth and willing to try different things.
6. I am not sure but seem to be self-efficient.	7. No longer says he's unable to do things.	8. Self confident and better moods.	9. Self-discipline and confidence.	10. None.
11. More helpful. Thinks team work with his sisters is great.	12. Non noted yet.	13. Has learnt to persevere.	14. Lazy and tired does not want to do homework.	15. Attitude and behaviour have improved, thank you !
16. His attitude to school - he feels it is now fun.	17. My child seems to have more energy and enthusiasm.	18. Confidence to try new things.	19. Little change.	20. More enthusiasm and confidence.
21. Change in attitude and behaviour.	22. She has become more self-assured and very enthusiastic about outdoor activities.	23. None.	24. Has taught my child to venture out – get away from T.V.	25. For now I have not yet observed so much change.
26. His attitude has definitely improved 100%.	27. Independence, discipline and appreciation to mention a few.	28. More outgoing, confident, interested in nature and environment.	29. For now I have noticed more interest in participating in these events.	30. More confident and positive.
31. Better moods.	32. He had become conscious of the consequences of silly behaviour.	33. General self-confidence and proud of the adventure school image.	34. More positive attitude towards school.	35. My child has just started the programme. It is still too early to comment.
36. There is an improvement in the behaviour of my child.	37. he enjoys activities –.he says it has taught him a lot.	38. More organized and willing to interact with others.	39. It has developed the self-confidence of my child to a certain extent.	

Table 11.1 Parent observations of their children in their home context in response to the above question

- Parents 2; 5; 6; 8; 9; 20; 18; 22; 28; 30; 33; 39; or 30% of this sample of parents, made observations they interpreted as improved **self-confidence or self-esteem.**
- Parents 1; 3; 7; 13; 15; 16; 21; 26; 27; 34; 36; or 28% of this parent group, think that some **self-improvement** or **attitude change** has occurred as a result of adventure programmes.
- Parents 4; 11; 17; 24; 38; or 13%, attribute **increased responsibility** to adventure activities.
- 17% of this sample parents are **not certain of any positive effects.**
- No parents in this sample mention any negative or adverse observations.

Table 11.2. Overview of the parent observations as to what they perceive their children have learned from adventure-based experience:

11.1.2 Responses from parents of grade 6 and 7 learners

The sample of grade 6 and 7 parents consisted of 21 respondents. They were asked to respond to the following question:

What do you observe in your child's behaviour and habits that you could attribute to his/her involvement in adventure type activities within the school curriculum ?

The responses to this question were again arranged according to NMUs which emerged from the paragraphs written by the respondents. The researcher in this case collapsed the NMUs into four categories according to the most commonly used words or phrases. The categories are shown in table 11.3; and table 11.4 reflects the number of times that these categories were used by the respondents. The table gives an indication of the percentage of the NMUs used.

- Self-confidence, sense of achievement and participation
- Team building and leadership
- "Life skills" (undefined or specified)
- Negative responses

Table 11.3. Shows the four NMU categories

Natural Meaning Units	Number of times mentioned	Percentage used by respondents
1. Self confidence and sense of achievement or participation	13 times	61%
2. Team building and leadership	10 times	47%
3. "Life Skills" not defined	7 times	33.3%
4. Negative responses	2 times	9%

Table 11.4. Illustrates the percentage that these NMUs were used by this sample of 21 parents in responding to the question asked.

11.1.3 Examples of parents' voices

Eight examples of parent voices used to support the findings as illustrated in the above tables are quoted below. The writings have not been edited.

(i) Adventure activities and eco-challenge sport in my opinion is an excellent opportunity for them to learn and apply different life skills which will help them as they grow up in their real life scenarios.

(ii) We have noted a development of self-confidence plus an inclination to work without prodding. We believe that the adventure type activities have definitely had a positive contribution to the development observed.

(iii) It is my understanding that these activities lift the limits which children set themselves. For example Maxine did some abseiling – for someone terrified of heights – it is a great achievement. It certainly heightens their self-confidence.

(iv) I am impressed with the sense of enthusiasm D has shown towards all adventure activities. He has always been keen on sport but the adventure activities has really sparked a special interest in doing things better, perhaps a sense of pride in what he does.

(v) Although B was initially nervous to do outdoor adventure stuff her positive attitude came to the fore which led her to experience activities like abseiling

and paddling. Once having experienced these activities her confidence to be more adventurous in everyday situations has soared.

(vi) Both my children have been through a lot this past year, but have gained friendships and strength of character though the activities like canoeing and the cycle race. They have pushed themselves to limits that they never thought they would complete. Keep up the good work Lilyfontein and thank you.

(vii) The G children are obviously afraid of adventure except for D. The adventure aspect seems very fancy for the girls but when it comes to the crunch they pull out. So adventure to the G girls means zip !!!

(viii) I do think that the adventure type activities should be included in the curriculum. However I do think that it should not be something which counts for points or percentages but remains a fun type activity. There is enough pressure on children currently.

11.2 Educators' responses to the same question:

What do you observe in your learner's behaviour and habits that you could attribute to his/her involvement in adventure type activities within the school curriculum ?

11.2.1 Examples of voices expressed by the academic or class educators of the learners.

(i) Educator one

I have been impressed by the different attitude when my class is involved in adventure leadership activities – encouraging rather that mocking or teasing each other. It doesn't seem to be influencing classroom behaviour at this stage.

(ii) Educator one (one year later)

Although this year I have a different and very difficult class with a number of hyperactive pupils I do think that after they have had their adventure leadership or teambuilding days they seem to be more co-operative and listen better for a while at least.

(iii) Educator two

Some of the children who were apprehensive before adventure leadership activities seemed to have gained more self-confidence. They may not have wanted to participate but had gained a sense of achievement after successfully completing an activity.

(iv) Educator three

After their rock climbing excursion I noticed that a large number of them that had been particularly fearful and concerned that they would not manage before the event were different children when they returned. They had got an amazing boost in their self-image as they were able to overcome fears and tackle the task that they had been assigned.

(v) Educator four

I can only quote one child with authority. KK's aunt says that her completion of the eco-challenge astounded her entire family and she is seen in a different light after that! Her self-confidence has improved and she is more positive at home about all things.

(vi) Educator five

Pupils are definitely developing better problem solving skills as they are put into real type situations (unlike class based stuff) where consequences are real (can fall or let the team down). I see better listening skills as well as respecting others' ideas about approaching solutions to tasks.

(vii) Educator six

Yes particularly with learners having to make serious decisions and solve real problems without even been aware of doing so. If during an adventure activity learners are stuck in a situation they need to think of an alternative way of completing the task, their ride, paddle, climb or abseil and this is true problem solving.

(vii) Educator seven

They are challenged mentally, physically and emotionally and this helps to channel their energy positively. They accept that it requires a positive attitude and a strict behavioural code to be successful in a task and thereby hopefully they learn lifelong habits of the importance of a positive and focused attitude.

(viii) Educator eight

The learners have to think and plan. They carry out the activities which will show whether their plan worked. If not they can learn, firsthand, why it didn't or did work. They will also learn from each other.

(ix) Educator nine

It takes endurance and focus to achieve self-discipline and consideration of others for safety and success. In adventure activities the achievement can be individual or group and the goals personal or team orientated but it does not matter so long as these goals are achievable, learners recognize this and feel good about themselves. This is the essence of good education, helping someone feel good about themself in a sincere manner.

(x) Educator ten

I recognize the value of these adventure programmes but some learners are taken out of class to assist with adventure as part of their leadership programme. I feel, however, that they do not yet show the maturity or responsibility to catch up with work that they have missed out on during their time away. Perhaps this should be addressed at management level.

11.3 Reflection on this chapter

This chapter has highlighted the voices which express the parents' opinions concerning their observations of their children in the home context. It has also looked at teachers' observations of learners as participants of adventure-based activities. The researcher acknowledges that this form of evidence may well be regarded as subjective, but as pointed out by Taylor and Bogdan (1984:9) in chapter six of this research, qualitative research is about placing primary importance on the social meanings people attach to the world around them. Consequently the voices of the parents and educators in this research are giving qualitative meaning as to how they perceive their children's learning experiences through adventure-based education.

This chapter has shown that the voices of the sample of people (parents and teachers) have pinpointed certain meta-cognitive strategies (MCS) that they feel are strongly related to adventure-based experiences. They are also able to identify the benefits of such experiences for their children and learners.

Chapter 12

Analysis and discussion of the actual performances of individual participants during adventure-based activities

This chapter reviews the observations of participants in three adventure-based activities namely, rock climbing, abseiling and canoeing. These activities were chosen as they form the adventure experiences of three different grades: grade 8 rock climbing, grade 9 abseiling and grade 7 canoeing. These are the school's annual adventure-based components of the Life Orientation curriculum for those specific grades.

One participant observation in each activity will be analyzed in detail, using the video footage as well as on-site observations and recordings captured by the researcher. The analysis will highlight the elements as used in Engeström's model of an activity system. It must be remembered that in activity theory (see chapter five, pp.82-97) contexts are activity systems and that an activity system integrates the subject, the object, and the instruments [tools and signs] into a unified whole (Engeström, 1993a:67). This analysis will also point out the contradictions between the elements of the activity as well as the resolutions to the problems by the participant employing meta-cognitive strategies (MCS).

12.1 Engeström's model as a base for analysis of the activities

The researcher has chosen to use Engeström's (1999) mediational structure of an activity system, and will use the conceptual model below, figure 12(a), to depict the observations made. The observations are made in terms of the **subject's** (who ever is engaging in the activity) attempt to pursue their **object** (what they want to achieve, outcome or their goals they have set for themselves or their group). See chapter five for more detail on activity theory. A conceptual model is useful in making sense of dynamic changes in an activity:

> An activity system contains a variety of different viewpoints or 'voices', as layers of historically accumulated artifacts, rules and patterns of division of labour. This multivoiced and multilayered nature of activity systems is both a resource for collective achievement and the source for

compartementalization and conflict. A conceptual model of the activity system is particularly useful when one wants to make sense of systematic factors behind seemingly individual and accidental disturbances, deviations and innovations occurring in the daily practice of workplaces. (Engeström, 1999:46)

Engeström's (1999) model of an activity system will be used as the conceptual format, illustrated below, but for ease of recording the content of the actions in each adventure-based activity the researcher will use a table as an analytical tool.

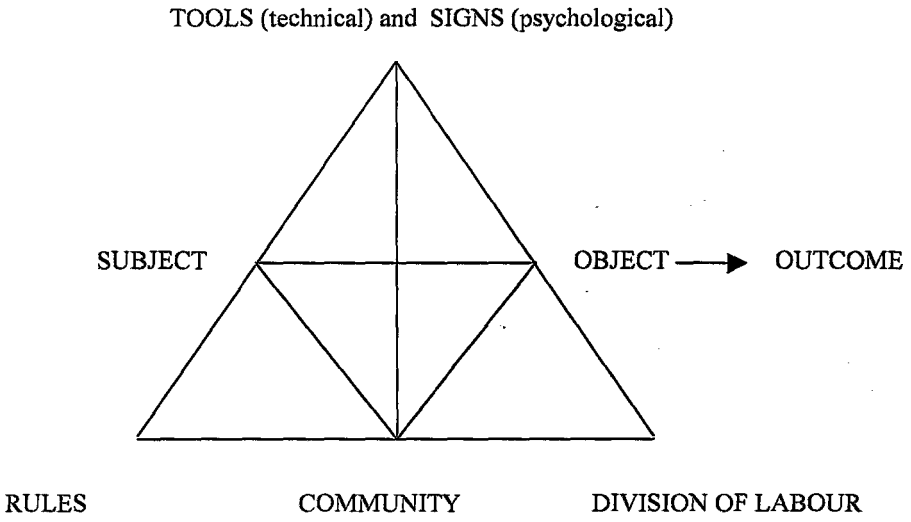


Figure 12(a). Engeström's mediation triangle model

12.2 Format of the analysis of different adventure activities

The format involved the researcher observing, recording (written as well as video) and talking to the participants as they were engaged in the different adventure-based activities. The researcher has chosen to describe the action of the participant in detail so as to capture the full meaning of the activity as it relates to:

- Engeström's elements of an activity, i.e. tools, artifacts, subject, object, outcome, rules, division of labour and community.
- The part played by the Zone of Proximal Development (ZPD). See chapter five p. 87 for more detail on the ZPD.

- The meta-cognitive elements or strategies (MCE or MCS) (p. 62), that mediate the action (p. 102) and the contradictions that occur between the elements in the action and how change takes place to accomplish the task's object or outcome.
- When the activity analysis is being read the following codes are used in the description of the observations of the learners. The codes are as follows:
    - [ ] refers to the elements of the activity system
    - ( ) refers to the learner involved
    - { } refers to the meta-cognitive strategy (MCS) being used by the participant.

12.3 Observation of a grade 8 learner doing a climbing activity

Figure 12(b). Grade 8 learner practicing for rock climbing on the climbing wall

The rock climbing activity was being conducted by the adventure instructor Mr K. Mr K repeats the explanations and demonstrations on how to put on the harness and the ropes, pointing out the importance of the correct knots to be used to do the job properly to ensure a safe and smooth climb. (This has been practised before at the climbing wall at school.) Mr K operates the safety line and he goes about talking the learners through the experience. One learner said that he had done rock climbing before. When Mr K asked him to come forward to try he was very unsure saying "I'm nervous" and "I've not done this for along time"; "I hope I can still do it".

12.3.1 Description of the observational analysis of the rock climbing activity

Codes used: [ ] = elements of the activity system ; ( ) = participants ; { } = MCS (meta-cognitive strategy)

Learner is ready:

Preparation phase:

(Mr K) [division of labour] assures him [tool: language] and then the learner (L) [subject] is guided into the harness [tools, artifacts] by the leader student (DI) [division of labour] and the safety check is done [rules] which the (L) has to verbally check and confirm [tools: language]. (Mr K) stands by to the side. The leader (DI) is on the safety line [tool: artifacts] and belaying [rules: safety] the climber.

The climbing phase:

As (L) climbs [object] he selects a path he sees as the best for him to take {MCS: planning/decision making}, deciding on footholds and handholds {MCS: decision-making}. Learner's fingers seem to be painful, he stops and opens and closes his fingers and gives them a shake {MCS: emotional control/self-motivation}. Hesitations occur but (Mr K) waits to see if the (L) will deal with the situation {MCS: reflection/self-planning} before he talks and encourages. Clearly concentration and focus are paramount {MCS: self-monitoring}. Focus on the fingers in the handholds, stretching the body to the next handhold, he tests the amount of foot force he can apply on the hold. This can be seen by the vigorous adjustment of his toes and foot position to allow him to move his body position to the next level {MCS: self-evaluation}. He is about five metres above the ground, he looks down and this breaks his concentration. This can be seen by the way he pulls himself flat onto the rock surface and waits. He begins to tense up {MCS: coping with fear/self-management} and this interferes with his decision about the route and he gets stuck. He looks to (Mr K) for help, ...sir I... where do I go to... {MCS: self-monitoring and evaluation}. (Mr K) watches carefully not to interfere with the thinking and decision of the climber {MCS: planning/decision making} but decides that he needs

some talk. (Mr K) calmly in a very lowered voice, operating in the ZPD, tells him to relax and come down a hold and then move to his right and look for the hollow in the rock near the piece of grass [tool: language]{MCS: problem solving}. The (L) stops, looks but is scared to push on his legs, encouragement from the children at the bottom [Community] he slowly straightens his legs and gets to the next position {MCS: self-management and emotional coping}. Amazingly his progress is now more assured but he again has to move sideways to get to a better route to complete his climb {MCS: planning and re-planning}. He gets to the top and very carefully pulls himself onto the crown of the cliff.

Completion phase:

He moves away as instructed and begins to remove his harness under supervision of the other student leader. He moves to the safety zone and punches the air. How do you feel ... ? (Mr K). That was awesome sir can I go again sir !!

The learner is clearly elated and this is evident when he gets back to his fellow class members as they share hand slaps and congratulations.

12.3.2 Discussion

Remembering that activity theory attempts to understand the dynamics of activity by identifying contradictions or disturbances within, between or across the elements, object and subject. It is through these tensions or contradictions that opportunities for change and growth come about and may well allow the individual or the system to move to another level of operation.

Engestrom (1993a:71) points out that an activity system is not a stable and harmonious system. In different activity systems, the fundamental tensions or contradictions appear in different forms and this is what is behind any change and development in any system. In simplistic terms the adventure-based activities may range from very basic systems to more elaborately constructed systems which are evident during group dynamic type activities.

The table below, 12.3, has been devised to show the components of the elements in the activity that serve to mediate the rock climbing activity. These elements are according to Engeström's activity theory triangle. An attempt is made to identify the possible contradictions and tensions that allow the subject (L) and other elements of this system to be modified through meta-cognitive strategies like reflection, planning, self-monitoring, self-control of emotions and evaluating one's own performance so that the (L) was able to change his immediate action but also to improve on future performances to achieve the required outcome.

Table 12.1 below, is an analysis of the learner engaged in a rock climb activity as related to the elements of the activity system.

ELEMENTS OF THE ACTIVITY SYSTEM RELATED TO ROCK CLIMBING					
SUBJECT	OBJECT	TOOLS	RULES	COMMUNITY	DIVISION OF LABOUR
The grade 8 learner	For the learner to climb to the top of the cliff and encounter physical and emotional difficulties and obstructions to set up contradictions and conflict for the learner to learn how to manage such situations.	Technical: Harness, ropes, knots, the rock surface of the cliff face, weather, clothes. Signs: Language, background thinking, planning, fear, decisions, joy, encouragement, fitness, emotional control. Self-esteem, previous experience, self-confidence, ability to persevere. Coping in front of groups of peers. Trusting instructors	Safety, codes of discipline. Correct harness fitting, foot and hand positions, listening to instructions, no shouting or jumping, no climbing on own, sitting and waiting for one's turn.	The entire grade 8 class seated waiting to rock climb. The Instructor Mr K. The researcher standing to one side and not directly involved	The instructor Mr K, the student leaders, the learners watching, the learner engaged in the actual climbing, the researcher who is principal of the school.
DISCUSSION of the contradictions that occurred between elements of the rock climbing activity.					

Key: {MCS= meta cognitive strategy} : ZPD = Zone of Proximal Development.

The subject had indicated that he had climbed previously. When asked to climb he wanted to back off. Immediately a tension between what he had said and what he had actually done was evident, which would have affected the psychological tool in what his peers were thinking. How would he cope in front of his peers? So he changed his sign [language] {MCS: planning} possibly to have an excuse and give the impression that he had not climbed for a long time. This may have affected his concentration or confidence as he would have begun with a tension between himself and the object [outcome].

As he climbed, his initial route plan contradicted his ability to cope with that route. He had to reflect on his situation, {MCS: self-evaluate, think about and evaluate the situation, re-plan and decide} [psychological tools of meta-cognitive ability] to adjust this initial plan by changing his path. He was only able to do so after he was given guidance from an experienced climber, (Mr K), acting in the ZPD, to take him to the next level. Further tensions arose when the learner's physical fitness came into doubt, but it appeared as though the encouragement from his peers [community] and student leaders [division of labour] gave him enough courage {MCS: self-motivation and emotional coping} to continue. The other learners watching [community] had clearly seen the route taken by the first learner and subsequently many of them took that route {MCS: reflective thinking, evaluative thinking and planning}. The tensions for the first climber to achieve the outcome were different to a few others in that they had learnt from the lesson created by the first climber's contradictions.

For other learners different contradictions occurred:

- One learner could not adjust to the tightness of the harness [tool:artefact]; this created an amusement amongst her peers [community] and this put her off completely [contradiction with the object]. She had to summon up all her courage {MCS: reflection, self-management, self-evaluation, control} and use the encouragement from peers [community] to continue.
- Another learner was unable to adhere to the safety code [rule] which states that all other learners [community] must remain seated until the student leader [division of labour] has called them. He ignored repeated warnings [signs] and was then told by the instructor [division of labour] to remove himself and sit at a distance from the group. He was unable to climb that day, contradiction between the object, the rules and division of labour. This incident served to regulate the adherence to the safety rules [rules] and in so doing modified the behaviour of this entire system.
- A third learner who was very overweight did not have the strength to climb onto the first foothold and could not get any further. The contradiction here was between the [subject] her self-image [psychological tool] and the [object] to climb. This learner subsequently lost 8 kgs and in 2004 is currently part of one of the school's eco-challenge teams {MCS: emotional coping, self- motivation, self-monitoring, self-evaluation, decision-making}.

- The fourth learner who was very scared of heights [psychological tool/sign] clung like a leech to the rock [tool:artefact] but was encouraged and cheered on by her peers [community] to complete the climb. She was covered in scratches and scrapes from holding too tightly against the rocks but completed the climb {MCS: emotional coping, decision making and self-motivation}.

12.4 Observation of a grade 9 learner engaged in an abseiling activity

As in the rock climbing activity in 12.3 the observational analysis uses activity theory as the basis for examining the actions of the abseil activity system taking place as the group of grade 9s are engaged in their adventure programme.

Figure 12(b). Grade 9 learner abseiling

12.4.1 Description of the observational analysis of the abseiling activity

Preparation phase:

The venue is a 75m cliff [tool: artefact/environment] at a local holiday resort. The learners have to attempt a 40 m section of this cliff. The grade 9 learners are in the hands of a qualified instructor. All the learners are given a debriefing on the safety codes [rules of the system] that will be applied at all times. This is then followed with a detailed instruction on the correct tying and use of knots, the positioning of the harness, the correct angle of the rope, the figure of eight, karabiners, etc. [tools: artifacts and technical]. The learners are reminded of what they have practised at school on correct form and procedure [rules: convention] like wearing gloves [tools: artifacts], hand positions, position of the feed hand, the starting body position when approaching the edge of the cliff, leaning the body out over the cliff to get into the correct abseil position [tools: technical]. They are then reminded of the critical nature of listening to instructions in this context and focusing on what the instructor says as he talks them [psychological tools and signs / language] through the exercise. All the learners [community] are then seated in a position at the top but back from the edge of the cliff. The learners are not free to choose to sit anywhere. This is for control purposes [rules] and the student leaders and instructor [division of labour] are strict about this procedure [rule: convention]. The learners are also shown how to approach [rule] the student leader [division of labour] at the top of the cliff when it is their turn. This student leader will then allow the learner to proceed under supervision to the abseil instructor at the cliff edge [division of labour is absolutely clear]. There is also advice on their behaviour – no getting up, shouting, shoving, need to listen, watch carefully and encourage others, getting mentally ready for the task (meta-cognitive strategy). Any learner who cannot follow the rules goes to the 'out of commission side' [rules and conventions] and does not climb on that day.

Pre-task observations:

Many contradictions become evident; learners known to be very active in class or who cannot sit still for long are as quiet as mice. They keep their position, observing the rules

without question (very different to the class room situation). The seriousness of the situation is understood by the learners and can be seen by the way they want to learn about the technical tools and the rules. There is no questioning of the instructions given by the student leaders or the instructor [division of labour]. The intensity of focus and learning is to be experienced. Quiet discussion between the learners is about their anxiety and concern that they will not cope. Support and encouragement between the participants [community] is remarkable.

Some voices were:

- "Sir I'm scared - I don't think I can sir!"
- "I really don't want to. Why do we have to do it!"
- "I'm scared of heights but I must try!"

12.4.1 Observational analysis of ONE participant abseiling

Learner (L) [subject] is faced with abseiling [object] down the cliff [tool:environment] using all the procedures and skills [rules and tools]. As (L) approaches the cliff and looks over the side a contradiction between the [object] and the [subject] occurs, the learner is no longer sure but the instructor (I) [division of labour] talks calmly [tool: language] to her, reassures her and begins a step by step leading procedure. Instructor is operating in the ZPD. (I) assures her that she is safe and shows her the safety line [tools and rules] which he is in control of [division of labour]. (L) [subject] moves to the edge of the cliff and correctly turns her back [rules and tools] on the cliff {MCS: planning, emotional coping, self-motivation}. (I) asks her to sit back into the correct abseil position [tool: technical].

This is the most difficult thing to do when learning to abseil. It is an absolute contradiction when you feel you should keep yourself close to the cliff face but in fact you should be sitting away out over the space below. If one can overcome this contradiction by using mental strength [psychological tool] and meta-cognitive strategies {MCS: planning, self-evaluation, self-monitoring, fear management, emotional coping} to use your feeder hand to release you to be able to sit back then the battle is won.

The (I) plays an important part in helping the (L) through this critical part of the abseil by operating in the ZPD for the participant. This (L) does rather well and no doubt trusts the (I), she manages to get into the correct position and then begins her descent, but as she moves she begins to straighten up against the cliff face: a contradiction between the rule and the tool. The (I) holds the safety line and talks her through again [sign: language] but takes quite a bit of convincing. Clearly she is thinking about her next move {MCS: reflection, decision making}. Although the (I) talking is crucial she is now on her own and has to plan her route by looking at the rocks, bushes, rocky outcrops, etc., [tools: technical/artifacts] and making decisions {MCS} on her own about her next move. She must consider safety, think about her body position, foot position, hand use and keep herself mentally focused, problem solve and deal with anxiety and fear [tools and signs: technical and psychological]{all these MCS affect the next move}.

All of these thinking processes involve using meta-cognitive strategies and in this case the (L) begins to get the hang of it and she achieves her outcome [object]. In her excitement at the bottom she forgets the rules [contradiction] but is soon reminded of the procedure of standing back, removing the ropes and harness and checking to see that she is free of all ropes [technical tools, artefacts and rules].

The walk back up to her peers is also regulated by safety procedure [rules] as the path back is narrow and dangerous [tool: environment] and being so elated the learners may not run but have to shown self-discipline and responsibility {MCS} as there is no one to watch them in this section.

12.4.2 Discussion and analysis

Table 12.2 below, analyzes the learner's abseiling activity as it was affected by the elements of the activity system. Contradictions and tensions allow modification of an approach through applying various meta-cognitive strategies {MCS} during the action.

Table 12.2 below, analyzes the learner's abseil action.

ELEMENTS OF THE ACTIVITY SYSTEM RELATED TO ASEILING					
SUBJECT	OBJECT	TOOLS	RULES	COMMUNITY	DIVISION OF LABOUR
Grade 9 learner	For the learner to abseil down to the bottom of the 40 m cliff. Part of the object is to deal with fear, apply self-help strategies and emotional control in order to realize the object.	Technical tools: Harness, ropes, helmet, knots, karabiners, figure of 8, gloves, the rock surface of the cliff face, water on the cliff face, weather, wind speed, correct clothes being worn on the day. Psychological tools Signs: Language, background experience, thinking, planning, fear, decisions, joy, encouragement, fitness, emotional control. Self-esteem, previous experience, self-confidence, ability to persevere. Coping in front of groups of peers. Trusting instructors	Safety, codes of discipline at top and bottom of cliff. Correct harness fitting, foot and hand positions, listening to instructions, no shouting, shoving or jumping. Staying seated in pre-abseil position. Remembering the correct procedure like sitting back, pushing with bent legs, hand release. Looking, planning and making decisions about next moves.	The entire grade 9 class seated in the pre-abseil position at the abseil site. The Instructor Mr K. The student leaders. The researcher standing to one side and videoing proceedings but not directly involved	The instructor Mr K, the student leaders, the learners watching, the learner engaged in the actual abseiling, the researcher who is principal of the school. Certain school rules and requirements.

Discussion of the contradictions that occurred between elements of the abseiling activity.

Key: {MCS: metacognitive strategy}

The subject was very keen and obviously had been motivating herself {MCS}. This could be observed in her facial and body action. Her object was clear in her mind. The pre-abseil procedures were smooth but

she became more anxious and kept on trying to look over the edge in spite of the (I) asking her to focus on the hand position. Being asked to turn her back and move backwards towards the edge slowly set up a contradiction in her mind, but was spoken through the action by the (I) [tool: language]. At the edge she battled to sit back out over the space: "I can't sit back it feels funny". (I) says "think about it in your head and slowly sit back I have you safely in my hands" [tool: language/sign: psychological] {MCS: reflection, emotional coping, decision making}, she does this and begins to find the correct position. (I) is constantly talking in a calm encouraging voice [tool: language/sign: psychological]. She begins to move and is doing well {MCS: decision making, emotional coping, self-motivation}, but looks down and immediately the seated position seems contradictory so she tries to stand. (I) takes the strain and assures her but she slips on the wet surface but she is safely on the safety line but now she has a tension with the slippery surface of the cliff and reasons that she should stand upright. This is the worst thing to do. Contradictions between the wet surface [technical tool] and the [rules] always be at right angles to the cliff face; don't try to hug the cliff; keep legs slightly bent at the knees and the [division of labour] the instructor's language says sit back but (L's) feeling is to get up against the cliff face. Her peers [community] are also shouting for her to sit out. (I) [div of labour] calms her down by talking [tool:language] now she must trust herself {MCS: emotional control, self-evaluation, reflection, self-motivation}and work at her body position. She is thinking {MCS: planning, problem solving} and releases her hand and slowly gets into sitting position, a few tentative moves, but from here on seems to grasp the action and plans the rest of her route and action rather well {MCS: self-confidence}.

(L) was faced with a contradiction when she got to the edge of the cliff as she did not think that she was going to be nervous when she got to the edge. The reality of the edge seemed to have created uncertainty in her mind. When she got to the point where she wanted to do all the opposite actions she was faced with serious decision making {MCS: decision making, problem solving}, with guidance from the talking (I) she had to reflect on and evaluate her position {MCS: self-evaluation and self-monitoring} and decide how she was going to get out of the jamb that she was in. It was through the contradiction that she had to do the opposite of what she instinctively felt like doing. This enabled her to get her thoughts back to allowing herself to sit back into the abseil position. Although she did know about the sitting position in abseiling, had practised it and was sure she could handle it; the tensions created by the actual rock face, the wet surface, the height [technical tools] and most probably the reality of the moment [psychological tools] created a contradiction. This contradiction meant that she was not able to use and apply the skills [rules: technical skills] due to not applying meta-cognitive strategies { MCS}. But it was through the tool of language by a more experienced person working in the ZPD that influenced her thinking and emotional control {MCS}so that she was able to focus and apply the skills [rules] which she did know, by using meta-cognitive strategies like {reflection, self-monitoring, self-control (emotions), decision making and problem solving}. She achieved her outcome and realized the object of the activity.

Once again the actions and experiences of the individuals on this day provided learning experiences for other grade 9 learners [community] through using meta-cognitive strategies {MCS: reflection, self-motivation}. These were the learners who attempted the abseiling activity on a later occasion. In some cases some learners in grade 9 had to make very little use of the Instructors and therefore could be said to be operating outside of the ZPD.

12. 5 Observation of grade 7 learners engaged in a canoeing activity

Many of the learners had previously done some water activities like canoeing, paddling, skiing, surfing or paddle skiing. The researcher has chosen to briefly observe a few of the learners who had never even attempted a water activity.

The instructor (I) does a lot of dry instruction [rules] on the grass next to the river [tools: environment]. The safety code for the water is emphasized and the learners are allocated "buddies" who are required to work with each other. They must also do a safety check on each other every so often. When the (I) is sure that most are ready to go into the shallow water they begin their activity.

Clearly, for most learners this is an easy task, so care needs to be exercised that learners do not fool around or try to show off. The student leaders take the learners who have already shown proficiency in these activities to a location away from the beginners.

There are five learners in the group being observed. None have attempted paddling before this day's exercise. Some of the learners were actually shaking and scared. One learner was not able to swim. All the learners are given life-jackets which they are shown how to wear [technical tools]. Two very proficient grade 7 learners joined the group to assist the beginners.

The (I) asked the learner who was so very scared to go first. He did not object at all but wanted confirmation that everyone was there to help. He clearly tensed up [psychological tool/sign] in the water. The other learners, student leaders and instructor standing in shallow water helped the (L) into the canoe [tool: artefact], he was then allowed to sit

[rule: safety] to keep his balance [tool: technical]. The (I) held the canoe at the back and then spoke to the (L) that he was going to release the canoe. He did this and the (L) capsized, the (L) was quickly fished out and made to stand in the water. This process was repeated about five times and then the (L) was handed the paddle. The (L) was not comfortable with the paddle [technical tool] at all and leant on the paddle in the water [tool: artefact, environment] and again capsized. The (I) held the canoe at the back and got the (L) to paddle standing still. The (L) was released and managed three strokes before capsizing again. This continued for at least 15 minutes. He was obviously getting very cold (environment) as he was shivering uncontrollably so the instructor told him to get out and dry himself. He did this. Other learners were given the same opportunity and they all managed after some capsizing.

(L) then came back and asked the (I) for another chance {MCS: emotional coping, decision making}. He did this and at the third attempt he paddled at least 20 m and then capsized but was then in deeper water, when his feet did not touch he began to panic a little [environment] but fortunately he was wearing the life-jacket [technical tool]. He clung to the canoe until the others helped him back. Currently this learner is able to paddle reasonably well and is learning to swim.

12.5.1 Analysis and discussion of the canoeing activity

Table 12.3 below shows an analysis of the canoeing activity as the learner encounters the elements of the activity system.

ELEMENTS OF THE ACTIVITY SYSTEM RELATED TO CANOEING					
SUBJECT	OBJECT	TOOLS	RULES	COMMUNITY	DIVISION OF LABOUR
Grade 7 learner	For the learner to learn to canoe/ paddle a distance on his own by overcoming fear of water and learning to balance.	Technical tools: The canoe and paddle, life-jacket, the deep water and river, cold, wetness. Psychological tools Signs: Language in all forms, background experience, thinking, planning, fear of water, unable to swim, emotional control. Self-esteem, self-confidence, ability to persevere.	Water safety, codes of discipline, listening to instructions, using the paddle, balance, body position. Making decisions about continuing in spite of cold.	The entire grade 9 class as well as the group of beginners. The Instructor . The student leaders. The learner helpers. The researcher standing to one side and observing and recording proceedings but not directly involved. Some bystanders watching the proceedings.	The instructor Mr V, the student leaders, the learners watching, the learner engaged in the actual canoeing, the researcher who is principal of the school. Certain school rules and requirements.

Discussion of the contradictions that occurred between elements of the canoeing activity.

The learner, being unable to swim and now wanting to canoe, was faced with overcoming his fear of the water [sign, psychological] as well as not being able to keep his balance [technical tool] on the water [tool, environment]. Every time he felt the water move he over accommodated and tipped into the water but he persevered {MCS: emotional coping, problem solving, self-motivation, self-evaluation}. He felt sure about his helpers [division of labour] and so felt safe [psychological tool]. His main tension seemed to become the cold and losing face as all the other beginners [community] had paddled some distance. Whilst he was drying off he was practising sitting on a log on the grass and trying to balance {MCS: reflection, planning, self-evaluation}. This seemed to help him when he returned to the canoe and paddle [technical tools] at least twenty metres to the delight of his peers [community].

12.6 Concluding discussion

The observation of these three adventure-based activities was done by making field notes and video recording for the rock climbing, field notes for the canoeing whilst the abseiling was recorded on video. Although the researcher will concede that some aspects were not captured the researcher feels that the essence of the human action in these activities was recorded. The analysis of these adventure-based activities uses the elements of Engeström's activity theory, i.e. subject, object, tools, rules, community and division of labour to look at the tensions and contradictions which occur and then to look at the meta-cognitive strategies (MCS) that help mediate the completion of the task. Although the analysis is not conclusive in each activity, the combined observations in all three give a reasonably clear illustration of tensions or contradictions that occur between or within these elements of the system. At this point the use of meta-cognitive strategies (MCS) to solve the problems and or make decisions to change an approach to an action is obvious. Clearly these meta-cognitive strategies (MCS) are employed regularly to overcome a contradiction and take the learner to another level of proficiency in an action.

Where these contradictions have occurred the participant in the activity has consciously or unconsciously applied techniques (internalization) to help solve the problem and help make a decision that would enable the climber, abseiler or canoeist to proceed to the next level of proficiency in the skill and to help them through the task. Such techniques like reflective or evaluative thinking, problem solving, re-planning or decision making are what this research refers to as meta-cognitive strategies. It is the researcher's observation that these meta-cognitive strategies (MCS) are used regularly in these challenging adventure-based activities and become internalized over repeated use. This is in line with the researcher's claim that these meta-cognitive learning experiences help learners become better self-regulated learners.

12.7 Reflections on this chapter

This chapter analyzes three learners participating in three different activities, rock climbing, abseiling and canoeing. Engeström's third generation Activity Theory Model is

used to interpret and analyze the human action in these activities. The elements of this activity model help to identify the domain of contradiction during action, for example a contradiction that occurs between the [tools: artifact] height of the cliff and the [object] which is to abseil down the cliff and the instructor telling you to stand on the edge and lean out [rules: safety] is a typical scenario. The coping mechanism in this contradiction, according to this research, is the subject's ability to employ meta-cognitive strategies (MCS). These MCS are elements or strategies like reflective thinking, planning, self-monitoring, self-motivation, emotional/anxiety or fear management, decision making or problem solving.

Although the adventure-based activities described in this chapter are primarily individual actions, activity theory and Engeström's third generation Activity Theory Model shows the importance of the mediational influences of all the elements in the system of action. Participants may also be assisted in overcoming contradictions through interventions in the Zone of Proximal Development (ZPD) to help further development take place. This development ought to lead to required change. Daniels (2001:56) uses Schneuwly's (1994) discussion of Vygotsky's theory to point out that the concept of the Zone of Proximal Development (ZPD) was a theoretical attempt to understand the operation of contradiction between internal possibilities and external needs that constitutes the driving force of change.

The participants in these activities show how they move through the required action by using various meta-cognitive strategies either spontaneously (prior internalization or learning of these strategies) or through assistance (ZPD). The three activities in this chapter also reflect the process of the learner learning these strategies (externalization), in the context of the elements of Engeström's third generation Activity Theory Model, as the learner applies the strategies in other adventure-based challenges.

Cole and Engeström (1997) represent cognition as the emergent new state of the subject's knowledge resulting from the analysis and synthesis of at least two sources of information in real time, the two being the object already held by the subject and the object represented through the medium. Their 'expansive cycle' (see pp. 122–123), which

represents a cyclical relationship between internalization and externalization within an activity that is constantly changing, is useful in the interpretation of these adventure-based activities to show the learning that happens. Cole and Engeström's thinking reflects a cultural theory of mind in which cognition is redistributed and "thinking occurs as much among as within individuals" (Daniels, 2001:93).

Chapter 13

Analysis and discussion of the group dynamics or initiative task component of adventure-based activities

The Lilyfontein adventure-based programme also includes group dynamic and initiative task activities as part of the Life Orientation programme. Some of the activities used are commonly used at outdoor-adventure centers but many have been designed and developed by the researcher and the adventure staff at Lilyfontein School. The evaluation instruments like the measuring tools, instruction sheets, rubrics, formats and processes used here have also been designed by the researcher and improved through use at Lilyfontein School. The objective of assessing the task performances of the learners is to determine the benefit of their meta-cognitive learning as well as the value of the programmes in the curriculum.

Because of the nature of group dynamics, the researcher sees these activities as a metaphor or example of Engeström's (1999) expansive learning cycle process. According to Engeström (1999:40), an expansive learning cycle is a developmental process that involves both the internalization of a given culture of practice and the creation of novel artifacts and patterns of interaction. It requires reflective analysis of the existing activity and the participants must know and understand what they must transcend or change.

The transformation that happens during a group dynamic activity as the activity system changes and the participants are faced with contradictions and collectively go about finding different solutions to the problem at hand is, for the purpose of this research, regarded as expansive learning. This expansive learning is mediated by the artifacts (apparatus, equipment or environment), rules, people involved, object(s) of the task and the meta-cognitive strategies (MCS) used by the participants. Engeström (1999:17) reminds us that these "cognitive actions" are distributed amongst all of the elements of his mediation triangle and the participants go about re-conceptualizing the objects. This study investigates the use of meta-cognitive strategies (MCS) to mediate the contradictions that will enable changes in the activity system to take place.

Yrgo Engeström and Michael Cole (1999:40) explain this by saying that:

> ...as the (expansive learning) cycle advances, the actual design and implementation of a new model for the activity gains momentum. The expansive cycle of an activity system begins with almost exclusive emphasis on internalization, on socializing and training novices to become competent members of the activity as it is routinely carried out. Creative externalization occurs first in the form of discrete individual innovations. As the disruptions and contradictions in the activity become more demanding, internalization inceasingly takes the form of critical self-reflection – and externalization, the search for novel solutions, increases. Externalization reaches its peak when a new model for the activity is designed and implemented. As the new model stabilizes itself, internalization of its inherent ways and means again becomes the dominant form of learning and development. (Engeström and Cole, 1999:40)

13.1 Rationale behind group dynamics and initiative tasks

The idea of group dynamics and initiative tasks is to give opportunity to learners to practice, through group interaction, certain meta-cognitive techniques. Meta-cognition is about thinking about one's own thinking, sometimes mistakenly called self-reflection. Meta-cognitive techniques and strategies are more than just self-reflection, they are a range of critical strategies used in becoming effective learners and users of life skills and thereby becoming self-regulated learners (Schunk, 2000:310).

Learners are placed in a situation where a task has to be carried out to accomplish specific outcomes. Meta-cognitive strategies (MCS) such as: listening and communication skills, planning and goal setting, evaluating and reflecting on an action, changing a strategy and then being able to review (think about) its weaknesses and strengths, are used to find ways of improving their efforts. This also involves problem solving and decision making during such activities. It also involves self-discipline, responsibility and other affective skills (emotional and psychological coping) necessary to accomplish this task. In simplistic terms the consequent activity becomes an activity system (Engeström; 1991, 1993, 1999, 2000); Engeström views an activity system as a complex formation in which equilibrium is an exception and tensions, disturbances, contradictions and innovations are the engine of change (1999:8). These systems may well have shared or distributed notions of culture, cognition, language, knowledge,

experiences or skills that contribute to the interaction of the group and how they solve the contradictions that occur – this according to Engeström (1999) is expansive learning.

A critical aspect is to encourage a learner to use language to identify and recognize a problem and then express this problem verbally so that changes can be made to a strategy (way of doing things) that is not working (this may be done collectively or independently).

The tasks are certainly physical but also provide a strong mental learning experience if facilitated properly. An important aspect is the **debriefing or review** that is led by the facilitator at the end of each task. The intention of this is to raise the learners' awareness of things that happened during the activity and how they need to rethink or change the approach they used during a group dynamic activity. This can be done by open ended questioning from the facilitator and – using the answers and observations from the learners to help the group improve their performance through better planning, listening, co-operation, communicating, reviewing, evaluating, re-planning or re-doing, encouraging, etc. so shift their thinking to another cognitive level. This is where creative externalization occurs and innovative ideas are explored. Although the learning that occurs during group dynamics is to a degree about more accomplished practitioners guiding learners to construct new ideas and solutions (ZPD); the group dynamic process is more about expansive learning. As the group finds their own solutions by discovering novel ways of doing things to accomplish their goals they are also internalizing the new practice of solving the problem at hand.

13.2 The procedure used for group dynamic programmes.

Facilitators are involved at each activity station. The facilitators are the class teacher, sports co-ordinators and the researcher in his capacity as Life Orientation educator. The facilitators have been guided through the process and all operate according to a specific format of instruction as indicated below.

Instructions for facilitators:

- Explain to the group the objective of the task as contained in the guideline document.
- Tell the participants that they need to listen to the instructions to be given (use the rules for each task as provided in the guidelines).
- The learners in the group can then discuss for one minute to see if they understand the task requirements.
- After this they may only ask three questions for clarity.
- Then they must get started.
- Facilitator ensures safety at all times.
- Facilitator observes and records performances, interactions, timing and keeps the score of the minus points (see the rubric or observation record, figure 13(a)).
- Facilitator must not advise or interfere, but must let learners solve their own problems. They have been given time to understand the task but if the instructor feels he/she was not clear then input marginally.
- Do a brief debrief/review at the end of the task in order to get learners to see what they need to work at in order to improve for their next task.
- Groups then rotate to the next task-station and the process is repeated.
- Four stations are used and this usually takes about 45 minutes (one period) to complete.

Whilst these activity tasks are in progress the researcher and facilitators monitor and record observations according to the observation recording sheet as seen in figure 13(a) below. This sheet is a recording tool to collect data in order to measure the value of the learning that happens during group dynamic activities.

13.3 Measuring tools used for group dynamic activities

13.3.1 Group observation recording sheet

An example is provided below, Figure 13(a). It functions as an observation sheet as well as a rubric to define standards. It is used in the field as follows:

- The names of the learners in the group are placed in the space at the top of the sheet and the tasks to be done are entered under the task rating columns.

- Two forms of assessment happen: Firstly, each group is awarded 20 points and according to the rules either loses or keeps their points, which are tallied for a group score at the end of all four tasks. Secondly, the group is assessed according to criterion referencing.

- This is a group assessment and is about assessing the performance of the group as a functioning system or team.

- The tasks are divided into three assessment categories: pre-task, task monitoring and post task.

- Each category is assessed according to criteria which are in turn assessed according to three levels of performance.

- Each level of performance has written indicators of performance that are a reflection of the standard of performance and serve as a guide for the assessor.

- This performance standard is rated according to a 1, 2 or 3 which is placed under the appropriate task column. This will indicate how the group performed using the meta-cognitive strategies (MCS) indicated in the criteria column.

- At the end of a task the facilitator gets the learners to reflect on their performance or self-evaluate (MCSs) and identify shortcomings or contradictions in their approach to doing the task. Having done this they must collectively use this new information (expansive learning) to improve their performance at the next task. This happens when the rotation to the next task occurs thus giving the participants an opportunity to apply and practise their meta-cognitive strategies during the task. This according to Engeström and Cole (1999:40) is "... training novices to become competent members of the activity as it is routinely carried out".

- The learners are given their score sheet which they take with them to the next task. They are free to examine the task, evaluate and plan ahead and use MCS. The assessment is then repeated by the facilitator at the next task station and this cycle is then repeated.

- At the end the entire group is asked to reflect on their experiences of doing the tasks and through specific questioning techniques used by the facilitator the individuals and group further identify the areas that affected their performance negatively or positively.

- This information is reinforced and the learners then decide what they would need to modify and change during further tasks or problem solving situations in order to be more effective.

OBSERVATION RECORD of GROUP no. .....Grade .....Date .....

Names: 1. 2. 3.

4. 5. 6.

7. 8. 9.

Criteria	Performance Indicators			Task rating			
	1	2	3				
PRE-TASK Planning							
Listening Skills	No listening, too many questions asked after instr.	Some doubt about what to do after instruction.	No questions no doubt about what to do after instruction.				
Communication	Uncontrolled, no planned discussion no directed talk	Some discussion still some lack of direction but evid.	Clear, precise obvious control with direction in their talk.				
Planning, goal setting + organizing	No discussion or planning ahead or organizing just dive in	Some planning and organizing taking place but could be improved.	Obvious planning, role allocation and organization effective.				
Decision making	Just acted no actual decisions	Some decision taking did not just act	Agreement and obvious decision taking with talk + thought.				
TASK Monitoring							
Communication	Very little contact making, just noise, no productive talk.	Definite attempts to communicate during task to change action	Clear communication, organized action due to good communication + good decisions taken.				
Evaluation	No attempts to check progress or id problems-Just carry on regardless.	Checking evident, thinking about problems to change action but slow.	Clear checking and assessing. Id of problems to change plan of action immediate.				
Decisions	No decision taking just bash ahead wrong moves made.	Some attempt to rethink and make decisions but delayed	Rethinking and decision making done with no delay clearly good decisions				
Affective	Plenty of arguing and in-fighting effects progress, emotions high.	Evidence of some squabbles does not effect progress though.	No squabbling encouragement and motivation helps the progress.				
POST-TASK							
Review and reflection	No attempt to talk about or id strengths or weaknesses and learn from task	Some evidence of talk + id of S + W to improve task performance after debriefing.	Id and use S + W to improve their task performance frequently after debriefing.				

Figure 13(a). The example of the group observation sheet as used above.

13.4 An example of an actual task used in the group dynamic programme

The following task activity is one example of a variety of tasks used as group dynamic challenges at Lilyfontein School. Each task will have an objective [object] that the team [subject] and [community] works towards achieving and will be measured against the [rules] on a minus scoring point system. The rules that must be observed by the subjects are part of the conventions associated with that particular activity and are applied in conjunction with the above instructions by the facilitator.

13.4.1 Task one: Balance beam crossing

Figure 13(b). Learners in action on the balance beam (see saw)

Objective: Get your team across the balance beam in two different ways.

Rules to be observed:

1. Team must cross in two different ways: seated and standing positions.
2. Must be in contact with their team members all the time (-1 per break).
3. Get off one at a time at end but still in contact. (all jump off -5).
4. Return to other side in different way.
5. If fall off (-5) and start again.
6. Feet may NOT touch ground when on the balance beam (-2 if touch).

- Do a brief debriefing/review to get learners to see what they need to work on to improve when they go to the next task.

13.4.2 Further explanations and examples of group dynamic tasks

These additional tasks may be seen in appendix A with photographs of some tasks in action.

- River crossing
- Medium height pole crossing
- High pole crossing
- Patient carry over obstacles
- High wall climb

13.5 Interpretation of the results of the group observations

The observation score sheet, figure 13(a), scores how the participants perform in the use of the meta-cognitive strategies (MCS). The score of one (1) will indicate very limited use but the score of three (3) will reflect a high use of the MCS. By logical induction if the scores of a group or individual at the beginning of a task are low but by the end are consistently high, then it must follow that some learning has taken place. Similarly, if the score is higher in the next task then proficiency in that task has improved: but it must be asked what has caused this improvement in the task if the actual physical task itself is new and its specific skills have not yet been learned or repeated. Consider that the next task has a different object, tools and consequently different physical and mental demands. This research claims that it must therefore be the learning, practise and internalization of meta-cognitive strategies (MCS) that help the individuals and groups improve their performance. The participants internalize the meta-cognitive strategies (MCS) and learn to apply them in different situations and scenarios.

The researcher has interpreted the results of the group performances in the following manner. The results from the score sheets were totaled per group and then placed into a matrix drawn up to indicate the tasks, the group number and the sequence in which the groups did the task. The total scores for the tasks done first and last in the case of each group are indicated for the four classes in table 13.1 below.

	Grade 6		Grade 7		Grade 8		Grade 9	
	First	Last	First	Last	First	Last	First	Last
Group one	Balance beam 13	Pole crossing 20	Balance beam 14	Patient carry 18	River crossing 18	Pole crossing 26	Pole crossing 14	River crossing 26
Group two	Spiders web 17	Patient carry 21	Spiders web 19	Pole crossing 24	Pole crossing 9	Wall climb 24	Wall climb 22	See saw 25
Group three	Patient carry 16	Spiders web 19	Pole crossing 15	Spiders web 22	Wall climb 22	See saw 25	See saw 18	Wall climb 24
Group four	Pole crossing 14	Balance Beam 16	Patient carry 17	Balance Beam 20	See saw 20	River crossing 25	River crossing 12	Pole crossing 23

Table 13.1. Sequencing of tasks and scores achieved in the group dynamic activity showing the consistent improvement of scores from the first to the last task.

13.5.1 Reflections, analysis and discussion on these results

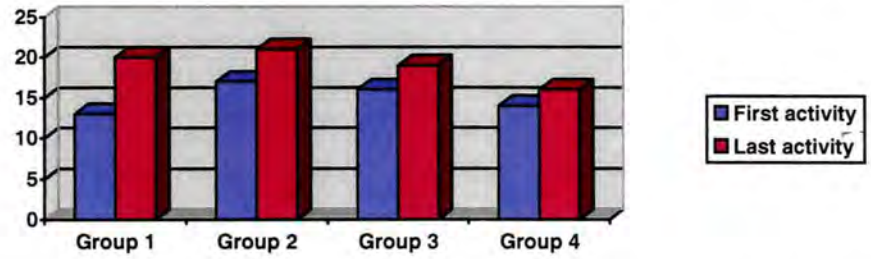
- In all cases in grades 6, 7, 8 and 9 an increase in the score from the first to the last task is evident. In some instances the score increased from 9 to 24, a 37% increase, see figure 13(c) on p.231. What this clearly indicates is that the group has thought about and reflected upon how they performed in the previous task; then reflected and discussed how they will act or behave (adopt different strategies) in the following task. This improvement in the use of a strategy (comprising meta-cognitive elements) has been noticed by the facilitator as the overall performance in the task has improved. This may well be attributed to a

number of reasons and there is no significant indication (see chapter fifteen for comment) whether this phenomenon will transfer into other domains of learning, but that is not the purpose of this study. The researcher also acknowledges that the assessment of the learners by the facilitators can be influenced subjectively but the use of the indicators and descriptors in the score sheet provide reasonably accurate guidelines for the facilitator to make accurate judgments in order to identify strategies, i.e. meta-cognitive strategies (MCS) that are put into use by the participant.

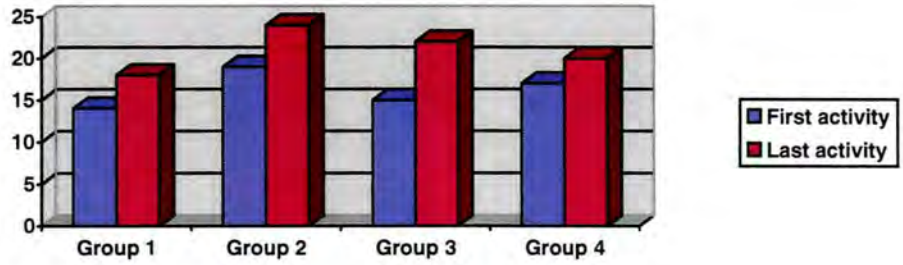
- One of the purposes of this assessment exercise is to create an awareness in the facilitator so that he/she is able to feed back to the group on their performance in the use of meta-cognitive strategies after each task. In this way the facilitator creates a dynamic learning system through the activity where the learners are able, through the feedback from an observer (ZPD), to work at their meta-cognitive strategies. This feedback will help them improve their performance in the following task and consequently improve their use of meta-cognitive strategies so that they will internalize this learning (expansive learning) and in so doing become better self-regulated learners.

- As the tasks were in progress the researcher was able to observe classical Engeström 'contradictions' between the elements of the activity system. One example was at the pole crossing, the analysis of which can be seen on p. 237.

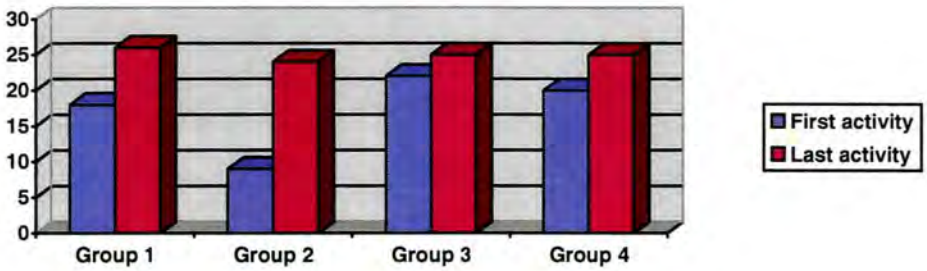
Figure 13(c) illustrates the improvement in performance by four groups in each of grade 6, 7, 8 and 9, during group dynamic tasks. These scores show the improvement between the first and last activity in each case. This consistent improvement is an indication of the application of meta-cognitive strategies during the activity; serving as a valuable learning experience for the participants.



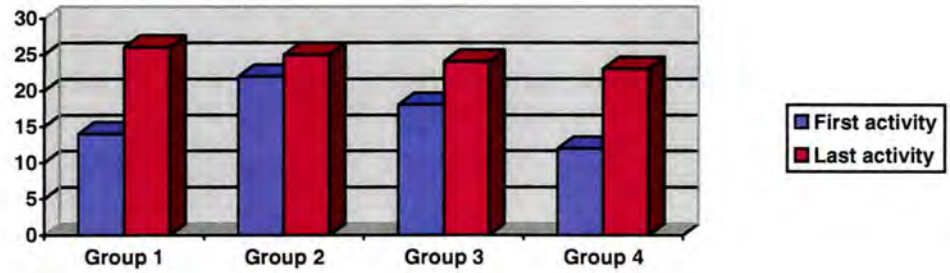
Grade 6 group dynamic results showing the consistent improvement in performance by the group from the first to the last activity, indicating the application of meta-cognitive strategies.



Grade 7 group dynamic results also showing the consistent improvement in performance



Grade 8 results also showing consistent improvement between the first and last activity



Grade 9 results show the same pattern of improvement between first and last activities.

13.6 Observations of an individual's performance in a task

It must be remembered that the individual is always part of the elements of a mediational triangle or activity system (Engeström, 1993b). The individual is at any time in the life of an activity system part of the subject, community or division of labour and furthermore is affected by these as well as the other elements like tools (artifacts or apparatus used) or signs (language, emotions, thoughts, meta-cognitive strategies) and the object of the activity.

In order to measure individuals' performance and their use of meta-cognitive strategies a measuring tool has been designed by the researcher to attempt to track individuals' progress as they work through the group dynamic tasks.

- The progress of the learner is measured according to selected elements that in the opinion of the researcher are representative of elements that support self-regulated learning.

- The elements that have been selected for observation are cognitive elements, affective elements, leadership elements and physical elements.

- These four elements have then been formulated into criteria or strategies that best represent that particular element.

- Some of these strategies are meta-cognitive strategies (MCS).

- The elements are assessed according to a simple rating key that indicates that the learner is competent or still needs help to apply these strategies.

- The facilitator needs to observe the learner in action during the task.

13.6.1 Comment from the researcher on this measuring tool

Having used this tool a few times it is clear that it is very difficult to manage together with the group assessment tool. In fact the researcher and facilitators have modified this tool's application so that only one person does this individual observation and moves from group to group observing only four learners at a time through all activities. This is time consuming and requires an additional staff member. This individual recording tool has been modified by the researcher for easier use in the field. An example of the modified version can be seen as appendix B which eventually developed into the tool used in appendix C, this is explained on p. 265.

The researcher has, however, found the recording sheet below 13(d) very useful when used together with video recordings when analyzing the activities in more detail. This analysis will be seen in 13.2 below as well as in the chapters fourteen and fifteen as the different adventure activities are analyzed.

OBSERVATION RECORD OF INDIVIDUALS IN A GROUP TASK:

Key to assessment: O = not yet able : ✓ = Needs help to do : ✓✓ = competent

Criteria	Learners							
	1	2	3	4	5	6	7	8
COGNITIVE ELEMENTS (thinking)								
Plans, sets goals, thinking is organized and purposeful								
Listens to instructions, talks and asks purposeful questions								
Self-evaluates, reflects on action, ids own strengths and weaknesses								
Solves problems and makes decisions on his/her own.								
After thinking/ reflection makes changes to current way of doing things								
AFFECTIVE ELEMENTS (emotional)								
Copes emotionally with fear, stress and anxiety.								
Listens to criticism constructively								
Managers conflict								
Managers anger								
Has a positive self image and belief								
Has self respect and respect for others.								
LEADERSHIP ELEMENTS								
Leads and initiates discussion								
Influences decisions positively makes suggestions that are taken by others								
Is a solution finder, prepared to try things.								
Perseveres, not put off by mistakes, pursues task solution								
Works well with others, listens, pays compliments, encourages others.								
Not content with being passive and taking a back.								
Self confident, followed by others, makes facilitator think and take note.								
PHYSICAL ELEMENTS								
Physically fit, cardio vascular, up front, not puffing, takes on tasks.								
Strength, helps others to climb, carry, pick up.								
Agility, good movement, mobile, active positively.								
Good body image, open, helps, comes forward, offers, enjoys, happy.								

Figure 13(d). The individual observation and recording tool for group dynamic activities is indicated below.

13.7 Analysis of one group dynamic activity in activity theory format

13.7.1 Analysis of the grade 7s "pole crossing" activity

Table 13.2. Analysis of grade 7's pole crossing activity as they negotiate the different elements of the activity.

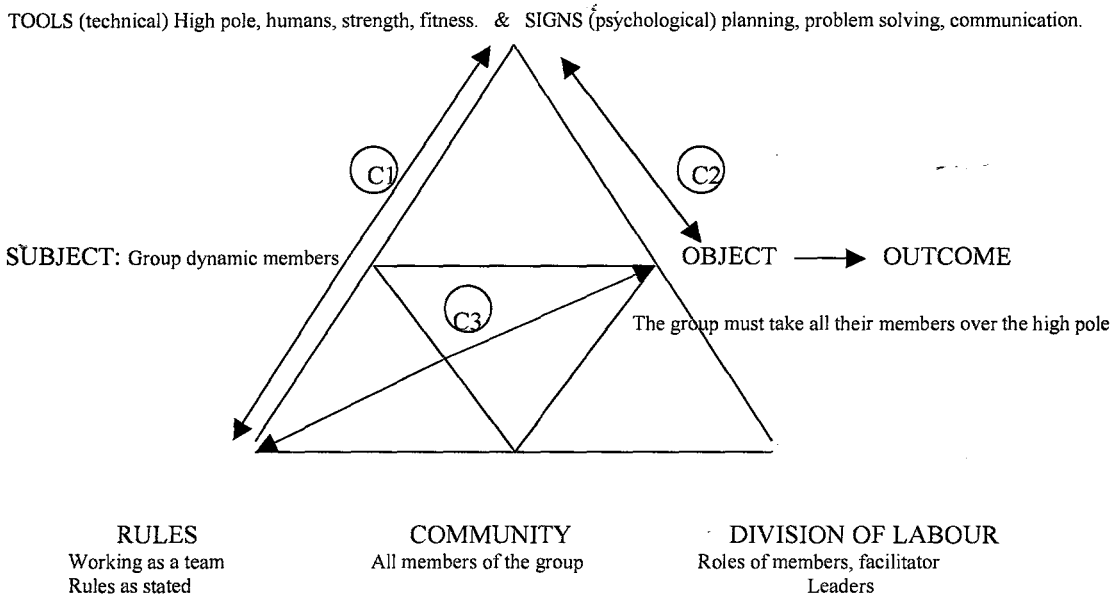
ELEMENTS OF THE ACTIVITY SYSTEM RELATED TO POLE CROSSING					
SUBJECT	OBJECT	TOOLS	RULES	COMMUNITY	DIVISION OF LABOUR
Five members of a grade 7's group involved in the group dynamic tasks	For the learners in this group to work together and co-operate so that the outcome of getting their entire group over the 2,5 m horizontal pole can be achieved.	Technical tools: A horizontal pole at the height of 2,5 m. The physical capabilities of the group members legs, arms, hands, etc. e.g. physical strength Psychological tools Signs: Language in all forms, thinking, understanding the rules, object, outcome, planning, evaluation, re-planning, fear of heights, emotional control, self-esteem, self-confidence, ability to persevere, e.g. mental strength. Working closely with others and coping with conflict. Encouraging others.	The rules as explained by the facilitator. Get entire team over the pole, may not touch side poles, once over may not assist others, may sit on the pole and help others. Instructions only given once and then allowed three questions for clarity then oprate entirely on own.	The entire grade 7 group as the different groups were competing for points. Their immediate group of 5 members. group as well as the other group against which they were competing. The different facilitators and their roles.	The facilitators. Each member of the group as they took on different roles according to their problem solving abilities. Their physical, intellectual and emotional capacities to contribute to the group's effort to carry out the task. Levels of leadership or non-leadership shown by the members.

Discussion of the contradictions that occurred between elements during the group dynamic task of the high pole crossing.

The main contradictions in this task were as a result of differences of opinions [psychological tools] as to how to go about getting the group over the pole [tool: instrument]. Many under estimated the difficulty of the task. Many thought they could do it on their own and not rely on the other members of the group; contradiction between the self-confidence, self-evaluation, the outcome and the division of labour. When planning the group [subjects] had not listened to the instructions [rules] and therefore; a contradiction or tension between the [rules and object] as they used the side pole [technical tool] and lost points [rules] {lack of MCS: listening, self-monitoring, planning}. They then wanted to ask questions; contradiction of rules, but no answer was given [rules]. Arguments began [psychological tools/ signs] and tesions emerged between different [subjects'] ideas as to how to work next. One of the subjects began to lead and organize [division of labour]. Using calm language [tool: language] she pointed out the problem and made a few suggestions. The group re-planned their approach {MCS: reflection, planning, self-evaluation, emotional coping, language}. The strongest girl and boy helped a lighter boy [division of labour] onto the pole, who sat on the pole and helped the next girl [community] onto the pole. {MCS: planning, problem solving, decision making, self-monitoring}. They were able to get the largest girl over the pole to the other side with plenty of struggle. Contradictions also emerged when some of the 'stronger boys' thought it was going to be easy to get onto the pole without help. They were forced to rely on others, even girls, to get them up onto the pole {MCS: emotional coping, self-reflection, self-evaluation}. At this point the group began to work together as a team [community] each using their [divisions of labour] size, strength, height for the benefit of the entire group {MCS: reflection, problem solving , decision making, self-monitoring, self-motivation}. During the review the group members recognized and pointed out the contradictions and tensions which they planned to improve on at the next task.

13.7.2 Group dynamic activity seen in Engeström's Activity Theory model perspective

Engeström's activity theory model would see the contradictions and resultant growth as follows in figure 13(e) below. Only three contradictions during the pole crossing activity are illustrated here. This serves as an example only and is not a detailed analysis.



Three Contradictions in the group dynamic activity

C1 = the contradictions that occurred between the rules of the task and the technical structure against which the subjects had to compete [high pole]. This then led to the contradiction C3 between the rules and the outcome of the task.

C2 = the contradiction between the participants' current thinking and the expected outcome of the object. This was due to a lack of meta-cognitive strategies (MCS) like planning, self-evaluation, communication, decision making, problem solving, etc. Once these meta-cognitive strategies were used the activity system or activity was able to progress to another level to solve the problem or successfully carry out the task. It could be argued here that the expansive learning cycle was operating.

C3 = contradiction between rules and outcome of the task. Having not listened to instructions the members went ahead to find themselves in a situation they could not solve, they had to reverse their hasty decision and re-plan {MCS}.

Figure 13(e). Analysis of three contradictions that occurred during the pole crossing activity

13.8 Concluding discussion

The use of meta-cognitive strategies (MCS) during the group dynamic activity was measured by using the instrument as shown in figure 13(a). The results of these observations show two clear patterns, namely:

1. that participants in the first activity did not listen to instructions and as a result found themselves in a situation where they lost points because of not knowing the rules. But this problem is soon recognized by the group members and is corrected at the following task. This can be clearly observed in their approach to the next task.
2. In the first activity individuals usually go blundering ahead and cannot manage the task on their own. Soon they are forced by the nature of the task to evaluate, re-plan {MCS} and come up with a better strategy. By the time the group gets to the second task some of the members are beginning to understand the significance of this joint collaboration. There are still a few that are not part of the new ideas and plans. By the completion of the fourth and last activity most have bought into the idea of listening to each other, being aware of how they progress in the task, thinking about their roles, being part of the solutions and feeling good about their result in the end.

The above point in 2 is illustrated by the results shown in table 13.1 and figure 13(c) above, in that in all 16 observations of the groups in grades 6, 7, 8 and 9 all showed an improvement in scores between the first and last activity, indicating an increased use of meta-cognitive strategies (MCS) in completing their task objective.

13.9 Reflections on this chapter

This chapter has described, analyzed and discussed how learners are placed in a group situation where a task has to be carried out to accomplish specific goals or outcomes

according to rules. In order to accomplish these tasks learners need to use certain meta-cognitive strategies (MCS) or skills such as listening and communication skills, planning and goal setting, evaluating and reflecting on an action, changing a strategy and then being able to review/reflect (think about) their weaknesses and strengths to find ways of improving their efforts. This also involves other meta-cognitive strategies like problem solving, decision making, self-discipline, responsibility and other affective skills (emotional and psychological coping) necessary to accomplish these tasks.

The consequent activity becomes an activity system. According to Engeström an activity system is a complex formation in which tensions, disturbances, contradictions and innovations are the engine of change (1999:8). A critical aspect of these group dynamic tasks is to encourage the use of language to identify and recognize a problem and then express these problems verbally so that reflection can happen and innovative changes can be made to a strategy (way of doing things) that is not working (this may be done collectively or independently).

This process is achieved through using open ended questioning by the facilitator and using the answers and observations from the learners to help the group to improve their performance. This may include planning, listening, communicating, co-operation, reviewing, evaluating, and even re-planning or re-doing, encouraging, motivating, to shift their thinking to another cognitive level. This chapter shows how meta-cognitive strategies (MCS) within an activity system function as they mediate the contradictions and changes that occur between the elements of an activity triangle. These MCS that occur during activities have been measured and used as evidence to support the idea that regular use of meta-cognitive strategies improves task performance and therefore ought to influence self-regulated learning. As these meta-cognitive strategies become internalized they become part of the learner's repertoire of problem solving, decision making and emotional coping strategies.

Chapter 14

Analysis of bridge building and raft building activities using Activity Theory format

Lilyfontein School's adventure-based programmme also offers a survival camp for the grade 6 to 9 learners which is conducted during one of the school holidays. This chapter describes and analyzes two activities which have been selected by the researcher out of a range of activities that were conducted on a grade 6 to 9 'survival camp'. Video footage as well as in-depth participant observations made by the researcher during the activities on site were used to extract the information as presented in this chapter. The observations were made in two ways: firstly the dynamics of the group were observed and video recordings made and then more in-depth observations were made of six individuals over the period of four days. The tools used for observation were the group and individual observation sheets as illustrated in chapter thirteen and then a modified assessment sheet that will be illustrated and explained in chapter fifteen.

The two groups observed in this case were formed by amalgamating two smaller groups into one bigger group of sixteen members. Each group had four senior learners who acted as leaders. The learners were formed into two groups in order to facilitate the use of the equipment and limit the number of bamboos to be cut down. Each group was given a set of task instructions and rules which the group had to observe.

14.1 The Bridge Building activity

The participants had to construct a bridge across a demarcated spot on the river following the instructions given. When completed the bridge had to support the entire group and withstand two timed jumps upon the bridge by the entire group. Only one support structure was allowed in the river itself. The groups were allowed to use only bamboo and rope; they were supplied with bow-saws and machetes (pangas) for cutting purposes.

Engeström's activity theory model has provided the framework for the analysis of this activity and the elements of the activity: subject, object, tools, rules, community and division of labour. These elements are considered as the activity unfolds. 'Contradictions' are discussed in the table below in an attempt to point out the possible points of change that occur during the course of the activity. It is these points of change or contradictions where according to Engeström that learning takes place through being mediated by the different elements of the activity. Table14.1 below shows that the bridge building activity did not produce many significant contradictions in spite of the amalgamated groups and the anticipation of conflict through the new group dynamics.

Table 14.1. An analysis of the bridge building activity in terms of the activity system elements .

ELEMENTS OF THE ACTIVITY SYSTEM RELATED TO BRIDGE BUILDING					
SUBJECT	OBJECT	TOOLS	RULES	COMMUNITY	DIVISION OF LABOUR
A range of learners from grade 6 to 9 including leaders of the groups.	For the learners to co-operate and build a bridge across the river as indicated. In so doing learn to use certain skills like planning, goal setting, problem solving, decision making, self-evaluation, management of conflict and anger. Communicate with others to achieve goals and in so doing build self-confidence through achieving success in the task.	Technical tools: Use of the cutting instruments, bamboo, rope and knots to be used. Psychological tools Signs: Language in all forms, background experience, thinking, planning, fear of water, unable to swim, emotional control. Self-esteem, self-confidence, ability to persevere. Encouraging others.	Only bamboo and rope to be used and only one support position in the river. The bridge has to support the entire group with two jumps made on the bridge. Time limitation.	The entire group as well as the other group against which they were competing. Those actively involved and others who were sitting about doing very little. The leaders, the instructor as well as the researcher taking videos.	The instructor Mr V, the student leaders, learners actually working. Learners doing smaller tasks but still involved others playing about and not actually involved in the task

Discussion of the observations of the contradictions that occurred between the elements of the bridge building activity.

The main contradictions in this activity were as a result of differences of opinion in the design of the bridge. In group one only seven of the learners were initially very active as part of the decision making, they tried a mock up out of small twigs and much discussion ensued. They took measurements and then some learners were tasked to go and cut and collect the bamboo. In group one this created disagreement which was resolved by the leader who instructed them to get on with the task. Group two appeared to have no conflict regarding the task allocation but could not agree on the type of support construction to be placed in the river. As part of the construction process some learners had to get into the water to hold the bamboo so that it could be tied in place. They were not happy about having to wear their track shoes into the water because the bottom of the river was too rocky, but rather that than have sore feet. Later they became very cold and refused to continue whilst others sat around doing nothing. The leaders then had to make changes which were not welcomed, but they happened. Constant communication {MCS: language use} was made between those who were involved [community] and [division of labour]. The contradictions that occurred seemed to be mostly around task duties, but were quickly sorted out by the leaders [division of labour]. On searching for an explanation for this lack of tension in this task the researcher is of the opinion that the nature of this task was very easy and 'non threatening', not really hard work – more fun orientated and therefore less likely to create contradictions between the object and the technical or psychological tools and signs.

The raft building activity posed very different challenges !

14.2 The raft building activity

The raft building activity consisted of two groups or teams evenly balanced, using criteria like, male and female, age, size and strength, introverted and extroverted. These groups were assembled by the leaders and facilitator who know the learners well.

The raft building activity and all the elements of its activity system are tabled below to create a framework to analyze the activity.

Table 14.2 below uses the activity theory framework to analyze the dynamics between the elements of the raft building activity system.

ELEMENTS OF THE ACTIVITY SYSTEM RELATED TO RAFT BUILDING					
SUBJECT	OBJECT	TOOLS	RULES	COMMUNITY	DIVISION OF LABOUR
Learners from grade 6 to 9 and leaders of the groups.	For the learners to build a raft from the materials provided that will support the entire group and be transported a distance up the river. In so doing develop or use self-regulating elements like decision making, problem solving, planning, goal setting, self-evaluation, and self-reflection to develop self-confidence in the learners.	Technical tools: The bamboo, ropes and drums, tying of knots and understanding of floatation. Cold water and wind. The slippery conditions, the bush and narrow paths leading down to the river Psychological tools Signs: Language in all forms, background experience, thinking, planning, fear of water, unable to swim emotional control. Self-esteem, self-confidence, ability to persevere, MCS.	Water safety, codes of discipline, listening to instructions. Rules as applied in this activity. Only the cut bamboo and the supplied drums may be used. All 24 drums were required to be used. Ropes may not be cut into pieces. Making decisions about continuing in spite of the rain and cold.	The entire group or team as well as the other group. The instructor . The student leaders. The researcher standing to one side video recording and observing proceedings but not directly involved.	The instructor Mr V, the student leaders, the learners watching, the learners engaged in the actual raft building, the researcher who is principal of the school.

Discussion of the contradictions that occurred between elements during the raft building activity

The discussions around the planning, the design of the rafts, their construction and transporting to the new location where they were to be floated caused much heated discussion. Decisions around the size of the raft to carry the entire group, length of poles and the structure of the frame created many tensions and disagreements. After the learners had planned their raft they had to dry construct it and then transport all the material down to the river to be finally put together. Who and how to transport the parts over the distance of 1 km and through thick bush with just a path to walk on created a lot of tension. Each group had to carry eight 4 m length bamboos and ten smaller lengths of 2 m bamboos, twenty-four 20 litre drums and 50 m of rope. The need to transport all of this equipment down to the river lead to very different ideas of how to transport these items. Contradictions between the task goals which was to build a raft (all were

very excited about that) and just transporting the equipment down to the river created major tensions and later conflict as the going became tougher. This can be seen in the more detailed analysis below.

14.2.1 Description and analysis of the raft building experiences of each group

The researcher has chosen here to describe the events of the raft building activity as was done by each group and point out the occurrence of meta-cognitive strategies (MCS) as the elements of the activity system interacted with each other for learning and progress to occur in the task. For the purpose of this study and reasons of clarity the researcher will use the following symbols to illustrate actions during the activity.

- Meta-cognitive strategies {MCS} illustrated by the following brackets { }
- Elements of the activity system will be shown by [ ] brackets
- Contradictions will be shown by ( ) brackets

(i) GROUP ONE

- **Transporting the materials.**

Group one [subjects] decided {MCS: planning, self-evaluation, decision making} to transport its materials in the following way. Ten drums were carried by suspending five drums at each end of a bamboo [tools: technical/artifacts] and the two leaders [division of labour] carried them, taking turns. Two of the bigger learners suspended five drums between a pole carried by the two learners and others carried two by two in hand using the handle {MCS: planning, problem solving}. Other learners [subjects, community] had to carry the long poles or the shorter poles. Two of the younger learners [division of labour] had to carry the 50 m of rope [tools: artifacts]

The two leaders soon encountered a problem in that the suspended drums were caught in the bush and trees [tools: environment] and impeded their movement forward [rules] (contradiction between object, tools and rules). The two bigger learners soon discovered that they could not get around corners in the bush with the pole between their shoulders

{MCS: self-monitoring and self-evaluation, reflection}. They got together and decided to change their plan {MCS: re-planning, problem solving}. The leader who was the stronger decided to pull the two long bamboos with ten drums attached to it like a sleigh through the bush. The second leader would do the same with eight drums attached to it, the remaining three to be carried two in hand by the three younger learners [division of labour]. The remaining long poles would also be dragged and the shorter ones could be managed by the carriers. Some of the younger carriers became frustrated when having to go along a path that was narrow and overgrown with fynbos. They did not have the strength to push the drums forward (contradiction: between tools of physical strength and object). One learner decided to walk backwards and pull the drums, this worked rather well {MCS: problem solving and decision-making}. The path was also very slippery and this made going difficult [tools: environment] and frequent falls began to create visible anxiety in the younger learners (contradiction: between the signs, psychological aspects, tools and object){MCS: emotional coping}. The leaders decided that they would have a break after every five minutes of walking {MCS: reflection and decision making}to get the spirits up. This frustrated some of the older learners as they wanted to get to the river as quickly as possible (contradiction: between the subjects, community and object). The older learners were very supportive and understanding of the younger learners {MCS: emotional coping}. One of the younger girls (grade 6) was very upset and found the going very tough, members of her team were very encouraging and helped her a lot {MCS: reflection, co-operation, communication} but unfortunately she elected to return home that evening (Contra: between her tools of physical fitness and signs of emotional coping and the rules of the activity).

Group one eventually managed to transport all the material down to the river in readiness to build the raft.

- **Building of the raft**

Group one set about their plan with plenty of discussion about the forces that would be playing on the raft {MCS: planning, communication}. The following voices emerged during the building process;

" Remember yesterday the knots slipped because they were on the wrong side of these bumps on the bamboo" {MCS: reflection, monitoring, evaluation, communication}.

"Yes Bru that 'cause the force was from the top, check now they'll be from the bottom up."

The raft was put together and then turned upside down and put into the water; it had barely hit water and, as the first person climbed on, it came apart totally. A comment from a member of the other group, "Check Dean and them's raft, like it's a pile of tins and bamboo ... ours looks stronger".

Discouraged, some almost gave up but one of the leaders suggested they start again but not with great enthusiasm. The group members brought the drums and poles back to the river bank. They decided to change their plan and one of the original suggestions made by two grade nine leaders was used {MCS: self-evaluation, planning communication, decision making and problem solving}. It was a simple plan, where they tied bamboo cross-pieces close together so that the drums would not fit through from the bottom and the "force of the water would help keep them in place". They did this and the entire team was able to get onto the raft and they paddled the required distance.

14.2.2 Summary analysis of group one's raft building task as an activity system

In this analysis meta-cognitive strategies will be referred to as MCSs.

At the start all the subjects in this group appeared to share the same object in their goals to build the raft. As the activity continued so aspects of the tools began to create a tension and contradiction between the younger members of the group and what they wanted to achieve (build a raft). The older members were faced with motivating the younger members instead of just carrying the equipment down to the river. They had to rethink their plan {meta-cognitive strategies, MCS} of carrying the equipment due to this contradiction. The younger ones had to say {MCS: self-evaluation and reflection} what would be easier for them to do but those who got bigger jobs were not happy (the community and the division of labour began to conflict). This set up a dynamic where

some of the learners wanted to give up {lack of MCS: affective aspects, conflict, self-reflection}. Eventually the terrain got easier and the problem seemed to solve itself, the learners began to help each other again.

Clearly, at the site of constructing the raft, group one was in conflict, the leader and another had their plan and two younger leaders had a plan (division of labour). The plan of the older leaders was used. At this point some of the learners withdrew and were not keen to help. It was these leaders who, after the disaster of the first attempt, reorganized and rebuilt according to their plan (contradiction of the division of labour). At this point a few of the previous learners sat back and watched. The researcher expected that this tension may influence the dynamic of the group in later activities but this did not really happen.

When the raft was launched all the learners claimed success and ownership of the raft and began chanting the name of their "tribe".

(ii) GROUP TWO

- **Transporting of the materials**

Group two decided to use the 50 m rope to link all 24 drums together and they distributed themselves between the snake of drums and decided to walk in time down to the river {MCS: planning, problem solving and decision making}. The longer poles were allocated to the remaining tribe members [division of labour]. All went well until they entered the bush and narrow path [tools: technical, instruments, environment]. They were not able to keep in time and the rope got snagged on the trees and bushes. Learners then would yank the rope and pull others off balance, others became annoyed and did the same so progression was slow (contradiction: between the tools and task object). The pole carriers encountered the same problems as group one in that they could not get around the sharp corners made by the trees. Group two were faced with a rethink and another plan {MCS: listening, self-evaluation, re-planning, decision making}. They decided to leave all the poles and first take all the drums down to the river, which they did. They then returned

and dragged the poles down to the river. Group two seemed to have co-operated more smoothly in this task.

- **Building of the raft**

They decided to build the structure like group one's second attempt but the cross bamboos were used to trap the drums between each pole. The drums were lashed to the poles with the ropes {MCS: planning and problem solving}.

Some voices;

"The bamboo should be closer on top otherwise the drums will come through, remember sir said that."

"Our weight will keep them down and in place ..."

"So we each have to sit on a drum but there are too many of them."

"Are thick man ! we sit on the poles and the rope will hold them."

Sudden hilarity: "Check, check Dean's group's bombed out, it's come apart." Much laughter and joking.

Group two eventually completed their raft. It looked very sturdy and well made; they turned it upside down and placed it into the river. It floated well. The members of the tribe then embarked, as the tenth member got on to the raft the drums began to pop up and within a few seconds the raft began to submerge. All the members quickly piled on and tried to claim success but they were going nowhere. By then the time was up and group two were not able to re-plan another attempt.

14.2.3 Summary analysis of group two's raft building task as an activity system

Group two had very little infighting and seemed to agree to decisions made and got on with the task at hand. When there was a problem they were able to resolve it without major tensions {MCS: listening, emotional coping, communication}. They had done well

in the bridge building task and appeared confident. The group was also faced with using a long piece of rope to tie the poles, and because they were not allowed to cut (rule) the rope (contradiction between the rules, the tools and object) they devised a way of speeding up the pulling through time of the rope. When the rope was taken through the loop it was given to a runner who would then run it out along the bank of the river. However, this burnt their hands (another contradiction between the subjects, object and tools) so they found a forked stick and ran the rope through the fork of the stick as they ran the rope out {MCS: self-evaluation, self-monitoring, decision making and problem solving}. This was an interesting method of speeding up the process of knotting and it worked, improving the function of the activity system surrounding the building of this group's raft. Perhaps this could be equated with Engeström's expansive learning cycle.

14.3 Results of the observations made on the group and individual performances

14.3.1 Group performances

The performances were divided into three observational phases namely, Pre-task planning, Task monitoring, Post-task review.

In each of these phases the observation recording sheet was used to measure predefined meta-cognitive strategies which have been identified by the researcher as elements of self-regulated learning. These meta-cognitive strategies/elements also appear in the Learning Outcomes and Assessment standards of the Revised National Curriculum statements for grade R to 9 and the National Curriculum Statements Grade 10 to 12 (schools) as has been shown in chapters seven and nine.

This observation sheet also uses performance indicators to determine the standard of the learners' application of the identified criteria. The standards were indicated by descriptions with a value of either 1, 2 or 3. The researcher acknowledges the subjective shortcomings of this tool but has not been able to find another measuring tool to accomplish the same task. The results of these observations will be used to establish grounded theory as far as it is related to the immediate context of this research and no claims are made beyond this context.

The group's performances were observed on site and video recordings were then studied to supplement and confirm the information used. The groups were observed doing a task on each day of the survival camp and their performance measured against the criteria;

Day one: Shelter building tasks (not described in this research)

Day two: Bridge building task (not described in much detail)

Day three: Raft building task (detailed description). An example of the administration of the measuring tool is contained in appendix D(iv).

The results were similar in both groups and are described as follows ;

1. In both groups the pre-task planning phase showed improvement in the use of (MCS) like listening skills, planning, goal setting, organizing and decision making by the third activity.
2. Communication skills showed only a marginal improvement.
3. In the task monitoring phase both groups showed marked improvement in the self-evaluation and the affective (emotional) criteria whilst group two showed significant improvement in the decision making criteria.
4. Decision making in group one and communication in both groups only showed a marginal improvement.
5. The post-task phase showed very marked improvement in both groups in all areas of the criteria.

14.3.2 Observations of the individual performances of six learners

Comment on the instrument used.

The measuring tool or instrument as described and illustrated on page 180 was used to track and follow the progress of six learners over the duration of the survival camp and then modified into another measuring tool to track progress for a period of one year following the camp. Using the criteria of cognitive, affective aspects, leadership and physical elements, observations were made of the six learners whilst they were engaged

in all aspects of the camp and were not only limited to the activities as described in this research. On site observations were made when and where possible, but the use of video footage which was analyzed later was very useful as the researcher found it difficult to be facilitating activities, ensuring safety and noting observations at the same time. These observations and video analysis were analyzed and brief comments made as indicated below. Out of this, seven of the most common meta-cognitive elements used by these learners were extracted and used in another instrument to track the six learners' use of these meta-cognitive strategies over a period of a year.

The process of observation and tracking.

Initially we chose five learners to be observed (they did not know who they were) but we then added the sixth who had shown considerable personal growth and development after the shelter building task and the bridge building task, particularly in the problem solving and leadership domains. The researcher then decided to track these six learners' progress by asking their educators and parents to make observations on their progress every three months. The instrument used by the parents, educators and researcher measures the use of seven meta-cognitive elements as used by these six learners who were observed according to the measuring instrument as shown in chapter thirteen, p. 208. Although the researcher recognizes possible shortcomings of this instrument, the results of these observations that have been made show the degree to which (in the opinion of the parents) these six learners continue to apply these meta-cognitive strategies after the survival camp and in other contexts.

The following are the summaries of the observations made on the survival camp:

Learner one (C) at the beginning of the camp was clearly anxious, did not initiate discussion, did not have self-confidence in her own ability to change an approach to a task. She did not make suggestions and did not like to make decisions on her own but by the raft building activity was taking leading roles and being a tower of strength and support for the younger learners.

Learner two (B) constantly had his own way of doing things that conflicted with the group and the leader and created a division (contradictions). Initially he did not work well with others in the group and had a negative attitude towards the tasks. However, a remarkable change occurred after the bridge building task and he continued to make a significant contribution to his group during the raft building task.

Learner three (G) enjoyed the outing and made the necessary contributions as was expected. He is a natural leader in the school situation. No changes noted.

Learner four (S) is also a natural leader and made significant contributions to her group. No changes noted.

Learner five (A) is a loner with little self-belief, needing to be close to the teachers involved, asking all sorts of unnecessary questions to get into a 'one on one situation'. He was also very nervous of sleeping out in the open in their group's self-made shelter. During the bridge building task he become more involved and obviously felt included and part of the group. After that he teamed up with a friend and never looked back. A significant change was noticed in his becoming more self-assured. This was evident through his volunteering to take on tasks, helping solve problems and no longer wanting to have the attention of the teacher.

Learner six (D) a learner with physical difficulties, came through very strongly in showing amazing perseverance, managing conflict between his group members in being able to diffuse two rather heated encounters between two older members of his group. As a thirteen year old he was showing the maturity of a seventeen year old in planning, conflict management and making decisions for the group.

The results of these six learners' self-regulatory capacities which were monitored over the period of the year at three data collecting intervals can be seen in chapter fifteen.

14.4. Reflections on this chapter

This chapter provides a holistic analysis of two activities done on the annual survival camp at Lilyfontein School: the bridge building and raft building activities.

The raft building activity was selected for more in-depth analysis as it provided more opportunity for 'contradictions' between the elements of the activity system to occur and consequently more scope for expansive learning to happen. This in turn highlighted the participants' use or non-use of meta-cognitive strategies (MCS) during the action.

Out of this camp six learners were observed over a period of a year in order to determine sustainability of the learning experiences on the camp and the reinforcement of meta-cognitive strategies learning that happens during school adventure-based programmes. Further comment on the effectiveness of this exercise will be made in chapter fifteen.

Chapter 15

Meta-analysis and discussion of the data generated in this research

This chapter reviews all the data from this study that provide evidence to supporting the major claim in this research that adventure-based activities play a mediating role in self-regulated learning and secondly that the Life Orientation curriculum is a vehicle to provide opportunities for such meta-cognitive learning to take place.

15.1 Introduction

At this point I would like to reiterate that this research has two goals, the primary goal and the secondary goal:

(i) The **primary goal** serves to answer two questions. Firstly, does the adventure based programme used as part of the Life Orientation curriculum at Lilyfontein School fulfil the expectations of the National Education Department's Curriculum statements in the GET and FET? Secondly, does the evidence gathered as the secondary goal in this study provide empirically valid reasons for a school to justify offering adventure-based activities as part of their Life Orientation curriculum?

This primary goal is achieved through using the evidence which has been generated as a result of the secondary goal of this study. This empirical evidence is continuously noted and tracked through an action research approach where regular meetings of stakeholders operate as focus groups to review the evidence and make decisions for the future curriculum of the school.

(ii) The **secondary goal,** which constitutes the major portion of this study, provides the empirical evidence to support the primary goal. This secondary goal explores two questions. Firstly and formost, do adventure-based activities serve to mediate participants' learning by improving meta-cognitive skills that in turn ensure learners become better self-regulated learners? And secondly, does the learning of these meta-cognitive strategies in self-regulated learning, support the requirements of the national Life Orientation curriculum?

This chapter analyzes the evidence generated for the secondary goal and has two components:

- The evidence of meta-cognitive strategies of self-regulation as observed and understood during the course of adventure-based activities.
- Evidence tracking the progress of six learners over one year.

15.2 Sources of evidence in this study

Evidence gathered in this study comes from a variety of sources at Lilyfontein School:

- Learners in grade 6 to 11 who have written rich narratives about their involvement in and experiences of adventure-based activities at Lilyfontein School.
- Written responses from the learners' parents to questions capturing their observations of their children's feeling and attitudes towards adventure-based activities as perceived in the home context.
- Educators' written responses to questions regarding their observations of the learners in the school and classroom contexts.
- Detailed and measured observations of learners engaged in a range of adventure-based activities through direct observation as well as video analysis of rock climbing, abseiling, canoeing and activities during survival camps.
- Observation and measuring the performances of learners in group dynamic activities.
- Analysis of learners as they engaged in bridge building and raft building activities through direct participant observation and video analysis.

15.3 Purpose of the evidence

This research claims that the nature of adventure-based activities (which incorporates activities like rock climbing, abseiling, canoeing, cycling, group dynamic tasks, horse riding, ropes courses and survival camps) serve to provide experiences through which learners become better at self-regulation.

Self-regulated learning, according to Corno and Mandinach (1983:95), refers to the deliberate planning and monitoring of the cognitive and affective processes that are involved in the successful completion of academic tasks. Furthermore, the capacity for self-regulation is defined as the child's capacity to plan, guide and monitor his or her behaviour from within and flexibly according to changing circumstances (Diaz, *et al.*, 1995:130). This study combines these ideas of self-regulation into a definition that Zimmerman (1989:3) puts forward; the construct of self-regulation refers to the degree that individuals are meta-cognitively, motivationally and behaviorally active participants in their own learning process.

Schunk and Zimmerman state clearly that there is a considerable body of evidence that teaching students to use self-regulatory or meta-cognitive strategies (MCS) can improve the effectiveness of their learning methods (1994:13).

The reader is reminded that this study adopts a broad view of elements that make up meta-cognitive strategies (MCS) such as: self-planning, self-evaluation, self-monitoring, reflective thinking, self-modification, problem solving, decision making, affective or emotional aspects (self-control), self-esteem or self-confidence as well as skills in communication (listening and talking).

It is necessary at this point to note that this study does not focus on the meta-cognitive element of self-motivation. The researcher acknowledges the importance of this component and points out that Schunk (1994:75) who highlights the work of Bandura (1986) as well as that of Zimmerman (1989) says that "...effective self-regulation requires that students have goals and the motivation to attain them. Students must regulate not only their actions but also their underlying motives". In the context of this study the researcher on the one hand felt that this element would open up an entirely new domain of investigation and therefore, for the purpose of this study, acknowledges the importance of the element of motivation, is aware of its presence in adventure activities but does not attempt to account for its influence in self-regulatory behaviour. Motivation, on the other hand, may account for the lack of use and application of meta-cognitive strategies (MCS) in adventure-based activities. Motivation is without a doubt an

important meta-cognitive strategy (MCS). The concept of self-motivation and the part it plays in many of the activities in this study is recognized throughout this research.

15.4 The meaning of the evidence collected in this study

It could be argued that this research has a narrow focus, however, the reader needs to take into account that the researcher has found no alternative research or resources that enable the consideration of a broader context which relates meta-cognitive strategies to adventure-based education. The strength of the empirical findings in this case study ought to allow for furthering knowledge in this field.

15.4.1 The narratives

- The extraction of the Natural Meaning Units (NMUs, see p.135) in the narratives clearly shows the relationship of these elements to what this study delineates as meta-cognitive strategies (MCS).
- Furthermore, they show a strong agreement with the concepts extracted from the National Curriculum Statements (NCS) as shown in chapters seven and nine. The reader is reminded of these meta cognitive strategies (MCS) found in the NCS.

  Goal setting, Self-planning, Problem-solving ability, Self-reflection, Self-improvement strategies, Self-evaluation, Conflict management, Positive Self-concept formation, Emotional coping, Self-management skills, Self-motivation, Decision making, Coping with change.

- The learners' voices in grades 6 to 11 provide rich examples of the impact that adventure-based activities have on the lives of learners of all ages.
- The narratives indicate the importance that different grades/age groups assign to what they regard as the most important meta-cognitive strategies (MCS) learned from adventure-based activities. The highest three are noted below.

  * Grade 8 to 11: Control of fear, self-confidence, goal setting and planning
  * Grade 7s : Facing fears, self-confidence and cognitive learning
  * Grade 6s : Self-confidence, trusting people, trust and facing fears

15.4.2 Parent observations of their children

- Parents NMUs indicate a high percentage (61 %) that attribute an increase in self-confidence and a sense of achievement to adventure-based activities.
- The parents' voices clearly express their perceptions that their children gain advantages through doing adventure-based activities.

15.4.3 Educator's observations of their learners

- Educators noticed some improvement in behaviour or attitude in the classroom context. Improved co-operation and listening were also observed by the educators.
- Educators noticed a definite growth in self-confidence and willingness to undertake problem solving tasks.

15.4.4 Analysis of learners' performance during adventure-based activities

This chapter will provide a detailed analysis of activities using Engeström's model of activity theory to analyze the adventure-based activities. Engeström's model uses the elements of subject, object, tools, rules, community and division of labour to track the happenings in the activity. This enables an observer to place the subject in relation to those elements and in so doing pick up more clearly the contradictions that occur. In this way the observer is able to understand the meta-cognitive strategy (MCS) that is being used by the participant to mediate learning in order to move to the next level of performance.

In the researcher's view, Engeström's model does not always provide clear explanations for the resolution of the 'contradiction' that has occurred between elements. The researcher in this study aims to explain more clearly what, in his opinion, it was that was helping the participant though the 'contradiction'. According to the researcher, closer observation reveals that one is able to judge the actual meta-cognitive strategy (MCS) that is being employed by the participant in trying to resolve the problem that he/she has encountered. This was made clear by the tool used to analyze the participants' actions in a task (see section 13.2, group dynamics: pole crossing, p. 233). If the learner is unable to

move ahead the instructor, facilitator or peers help the learner through to the next level of operation. Clearly this learning experience transfers into the next similar encounter which he/she is able to solve in part or independently.

The researcher's observations show that as the learners are exposed to further adventure-based activities they gain in self-confidence in using meta-cognitive strategies (MCS) to make better decisions and solve different problems. This has also been borne out by the observations of the six students as they tackled other activities during the course of the year.

15.5 The part played by meta-cognitive strategies (MCS) in an adventure-based activity

As was seen in chapter thirteen in the group dynamic analysis, as well as in chapter fourteen where the unfolding of the raft building activity took place, 'contradictions' (Engeström) between elements of the system occurred. After these 'contradictions' had occurred a change or a shift in an approach emerged in the current operation of the activity system.

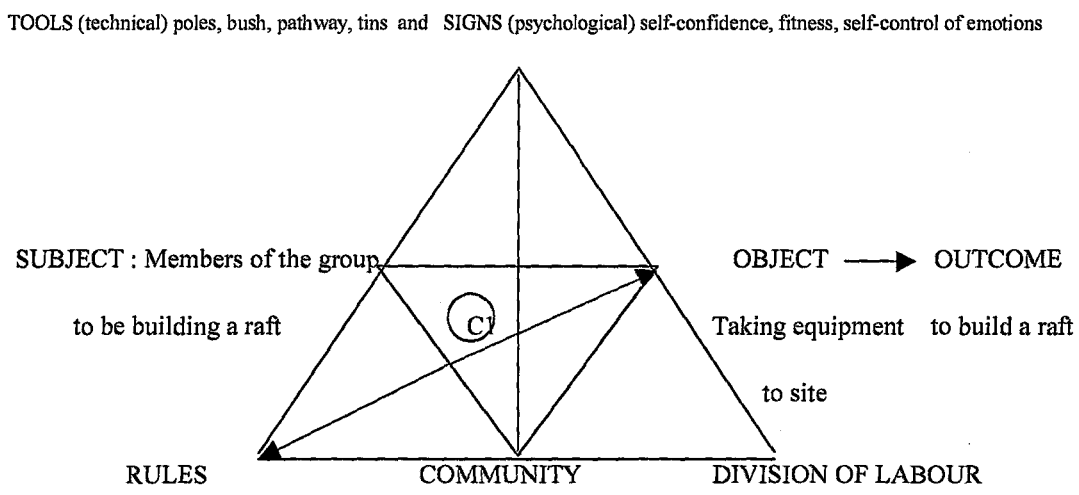
The crux of the claim in this research is that the change that occurs is because the participants [subjects] are able to apply certain meta-cognitive strategies {MCS} during the activity (either independently or with help). These meta-cognitive strategies (MCS), according to the researcher, are the catalysts for recognizing and identifying the contradictions the subjects experience in their action and furthermore providing solutions to allow the system to transform and grow. Engeström (1987:30) calls this transformation an "expansive learning process". An expansive cycle is a developmental process that requires reflective analysis of the existing activity structure (Cole and Engeström, 1999:40). This process of expansive learning: "...can be seen as the equivalent of traveling through the zone of proximal development at the level of the individual and small group learning" (Cole and Engeström, 1999:41). It is the researcher's contention that if the individual in the group has the capacity (self-efficacy, see: pp 47-49) of being able to self-monitor and self-evaluate they ought to pick up a 'contradiction' between the

object or outcome and the rules of the task (which may well have been a plan of action set up by the group or individual in the beginning stages of the activity). This may be communicated to the community [those engaged in the activity system] who make a decision to stop what they are doing and re-plan their approach [alter their rules]. This problem solving capacity serves to drive or facilitate change to the existing task approach which in turn would reduce the 'contradiction'. In this way the individuals re-align their approach with the object and outcome, allowing growth and consequent progression to the next level of performance.

In being able to apply these meta-cognitive strategies or "skills" to produce an expansive learning cycle, the learner is practising self-regulated techniques which ought to equip him/her to strongly influence learning both in the group context or as an individual. These evaluative reactions involve learners' beliefs about their progress; Schunk (1994:78) points out that the belief that one is making progress enhances self-efficacy and sustains motivation and progress. Engeström's third generation model below, figure 15(a), has been used to illustrate a contradiction that occurred during the example of the raft building exercise and how this was resolved to enable the system to move to another level of functioning (or object) in order to reach the intended outcome.

Figure 15 (a). Activity theory analysis of the raft building activity using Engeström's model to illustrate the contradictions that occurred

First phase of the raft building Activity system

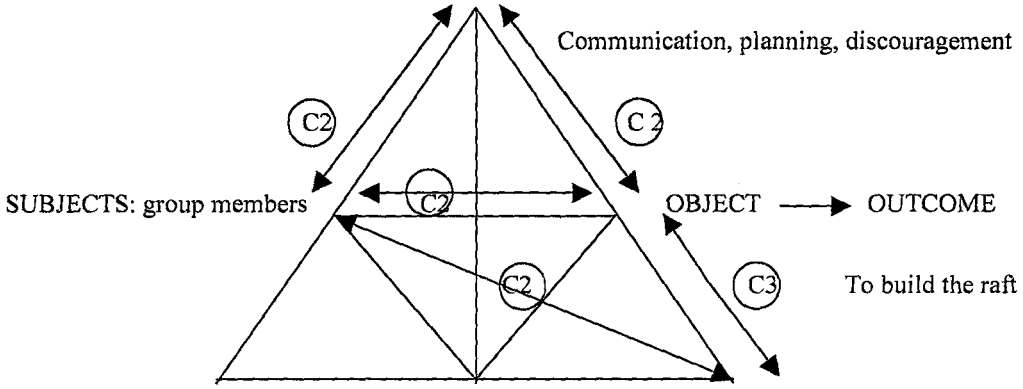


Working as a team Ideas and plans of how to carry the tools.	All members of the group	Carriers of the poles and tins Leaders, teachers,

C1 = A contradiction between the plans that the subjects had made (rules) and their object and intended outcome to build the raft. Their plan to carry the equipment down to the river to get started with the raft (initial object) was not working {MCS: self-monitoring and evaluation or problem identification}. Their [psychological tools] {MCS: self-confidence} told them that the divisions of labour (the carriers) were frustrated and were not progressing well {MCS: evaluation}. They saw this problem {MCS: self-monitoring and evaluation} and decided to call a halt {MCS: decision making} and talk [psychological tool of communication/language] about a new plan [rules and division of labour]. The [rules, ideas and plans] were changed {MCS: communication, re-planning, problem solving and decision making} and this enabled the division of labour to get the equipment [technical tools] down to river for the group [subject] to at least begin the raft building [object]. At this point the contradiction between the two elements was reduced. Effectively then, the system had changed from the immediate object of carrying to the actual object of building to become more effective. This group's activity system of raft building (object) then shifted to another level (building) where further contradictions occurred as illustrated below.

Second phase of the raft-building activity system

TOOLS: rope, poles, knots, tins, cold water and SIGNS: effects of cold water and wind, language, emotions



RULES	COMMUNITY	DIVISION OF LABOUR
Plan to put poles, tins together with the rope provided	All group members	Planners, thinkers, tiers of knots

C2 and C3 = Contradictions between elements.

C2 = Contradictions then arose between the younger members [subjects of the community and division of labour] who were getting cold [technical tools] and this tended to affect their attitude [psychological tool/ sign and emotional control] {MCS: motivation, lack of affective skills, emotional coping} towards the work to be done and hence the outcome. Clearly the younger members wanted to get the 'hard work part' of the raft building over so that they could ride on the river. The older ones [community] were shouting at the younger ones trying to get them to do the tasks that had been allocated to them [division of labour]. This was creating a further contradiction (between the subject, division of labour and the intended outcome) and the resultant disruption almost made the work come to a standstill. One of the leaders [division of labour] then suggested to leave them alone {MCS: reflection, decision making, self-management} and the three older leaders [division of labour] then got on with the raft building and then reassigned easier tasks to the younger ones [division of labour] {MCS: planning, self-monitoring, problem solving and decision making}.

C3 = One of the rules was that the rope should not be cut. This created a contradiction (between tools, rules and object, outcome) when tying the knots as the length of rope [tools] took a long time to be pulled through a loop to make a knot. To speed this process up the younger ones [division of labour] had to run the rope out and back {MCS: problem solving}; they regarded this as fun [change in the psychological signs/ motivation]. This change in the division of labour and resultant attitude shift led to a far more productive unit and the task of building the raft [outcome] become more efficient. The new technique of running the rope through their hands resulted in the younger runners burning their hands as the rope went through their fingers (contradiction between the tools and task completion). They adjusted their plan {MCS: monitoring and evaluation}, and after a few 'thinks' came up with the novel idea of running the rope over a length of stick. This was later improved by using a forked stick {MCS: problem solving and decision making}. As they ran, the rope was allowed to slip through the forked stick. This made for much more efficient knot tying. The left over members (community and division of labour) were then tasked to make a fire and cook lunch {MCS: decision making, problem solving}. Even though lunch was not directly part of the raft building it involved the subjects of the community in a division of labour that was seen to be part of the overall activity system of raft building.

15.5.1 Comment on the above raft building activity

The leaders (older students) and instructors (educator/teachers) play very important roles in the life of the activity in that as things happen so the leaders and instructors give prompting questions or words of advice as they see problems occurring. Their prior experience enables then to predict a possible contradiction or tension and this then helps to guide the learners through the experience. This is a mediating role operating in Vygotsky's ZPD. Kozulin (1998) says that:

> In mediated learning, an adult or more competent peer places him-or herself "between" the environment and the child – thus radically changing the conditions of the interjection. The mediator selects, changes, amplifies, and interprets objects and processes to the child. (Kozulin, 1998:60)

Engeström (1999) goes further in saying that the psychological tools also mediate learning. Kozulin (1998:62) builds on this by saying that while material tools are directed at the objects of nature, psychological tools mediate humans' own psychological processes. It is the observation of the researcher that as these processes in an activity happen they are mediated by influences from Engeström's range of elements [tools; technical and psychological, subject, object, outcome, community, rules and division of labour] but for contradictions and tensions to be recognized and dealt with it is necessary that contradictions in turn are mediated by meta-cognitive strategies. These meta-cognitive strategies (MCS) {self-monitoring, self-evaluation, planning, emotional control, reflection, problem solving, decision making, self-confidence and self-motivation} appear to be the catalyst that actually mediates further action and change in an activity. Perhaps these meta-cognitive strategies ought to be included as part of Engeström's tool element of his mediation triangle; this will enable a clearer explanation of what actually mediates the learning that happens in an activity and in this way contribute to an improved instrument of activity analysis.

Kozulin (1998:69) suggests that the development of abilities is also perceived not as a natural process of maturation and the acquisition of new information, but rather as an increasing ability to apply new cultural tools to one's own psychological processes. The table below, 15.1, shows the results of the observations that the rate of use of the meta-cognitive strategies without the intervention of a peer or adult is higher as the learners becomes older. Perhaps this may be explained by Kozulin's explanation of Vygotsky's notion of the ZPD.

> The difference in the results of performance with and without help indicates the ZPD. The ZPD can be interpreted both qualitatively and quantitatively. Qualitatively it points to those cognitive functions that are absent in the unaided performance of the child, but reveal themselves when the child is aided by adults. Quantitatively the ZPD is a measure of the difference between unaided and aided performance. The ZPD may also be interpreted as reflecting the ability of the child to benefit from adult assistance and cooperative learning. (Kozulin, 1998:69)

15.6 Evidence of meta-cognitive strategy (MCS) use and self-regulatory learning

The essence of this study is effectively the use of meta-cognitive elements or strategies of self-regulation during the course of the range of activities done as part of the adventure-based education programmes offered at Lilyfontein School. Although Kozulin above talks about 'cognitive functions', the researcher here sees these as possible meta-cognitive strategies (MCS) which help to mediate the learning in an activity. Research evidence shows that a learner with self-confidence (high self-efficacy and positive self-belief) is usually an effective self-regulated learner. Regular positive feedback on successful performance is shown to enhance the self-concept in a learner (self-confidence/ self-esteem/self-efficacy) (Schunk, 2000). Regular feedback is possible if learners are engaged in activities that provide the opportunity for successful performance. The nature of adventure-based activities allows learners to practise meta-cognitive strategies (MCS) regularly and thereby achieve such positive performances.

15.6.1 Measuring the frequency of meta-cognitive strategies in an adventure-based activity

This information has been gathered through the data collecting techniques mentioned in chapter seven and has been summarized in the overall matrix format below in table15.3. The various forms of the relevant meta-cognitive strategies (MCS), i.e. planning, self-evaluation, self-monitoring, self-motivation, self-control, decision making, problem solving and self-confidence, were scored in terms of their usage during some of the previously described adventure-based activities, i.e. rock climbing, group dynamics, abseiling and wall climbing. The scoring was done by the researcher through intensive participant observation and recording of meta-cognitive strategies (MCS) as used by the participants engaged in the activity.

In order to make more accurate observations the researcher had to withdraw from instruction and engage only in observation. This meant that the researcher had to find a method of being able to observe (keep a focused eye) on the participants engaged in the activity and at the same time record the observations being made. For logistical reasons

the observations had to be limited to one individual at a time; only four participants were observed in each of grades 6, 7, 8 and 9. This took a period of three months to complete.

15.6.2 The method used to measure the frequency of meta-cognitive use in adventure-based activities

The researcher employed a very similar method that gymnastic judges use to determine the score of a gymnast in action (this was explained on page 138). The technique used was based on intensive observation of the participant in action and recording observations according to a code or symbol that represents the meta-cognitive strategy (MCS) that was used by the participant during the activity. Recordings were done on the prepared recording sheet of paper (figure 15b). The researcher would then proceed to observe the learners in action and record the observations as they occurred. The recording sheet used (see appendix C) was a modification of the individual recording sheet used with difficulty in the initial stages of this research.

Appendix D shows an example of the scoring and recording method that was used during an activity. Figure 15(b) below shows an example of the blank recording sheet on which the symbols would be written (this example has been significantly reduced).

OBSERVATION RECORD OF ..... DATE.....

ACTIVITY: .....

Criteria	Observations of the action	SYM	TOT
Pre-task			
Actual task			
Post task review			

Figure 15(b). A reduced example of the observation recording sheet

The following were the symbols used to record the meta-cognitive strategies (MCS) as applied by the participant during an activity:

P = planning, E = self-evaluation, M = self-monitoring, C = Self-confidence, V = Self-motivation, F = self-control of fear etc., T = communication, D = decision making, B = Problem solving.

The dynamics of adventure activities are such that direct observation is rather difficult and painstaking. The researcher then found that the capturing of video footage with close-ups of the participants face and actions provided for clearer analysis in a more comfortable situation. The researcher made judgments as to what MCS was thought to be used by the participant as he/she engaged in the 'objects' of the activity. The representative symbol would be written on the scoring sheet, figure 15(b). The symbols that had been recorded on the recording sheet were then totaled up according to their MCS in order to find a value that has been used by the researcher to indicate the frequency of use of meta-cognitive strategies (MCS) in the observed activities. This frequency of use serves as an indicator of the amount of practice that adventure-based activities offer learners in the use of meta-cognitive strategies. Schunk (1994:13) claims that there is a considerable body of evidence that teaching students to use self-regulatory or meta-cognitive strategies can improve the effectiveness of their learning methods.

15.6.3 Meta-cognitive strategies used as an indicator of self-regulation

The challenge in this study was to find a method of being able to track the extent to which the participant worked on his/her own or needed help from other domains of the system involved in the activity. The researcher decided that when the participant's next move in the activity was due to assistance from peers or the instructor this needed to be indicated. The researcher circled the symbol to record this phenomenon. In this case the circle signifies the ZPD as described earlier. The frequency of the circles would indicate the participant's ability to use meta-cognitive strategies (MCS) independently. The greater the frequency of the circles, would indicate less independence and greater reliance on the act of scaffolding or the ZPD and conversely, fewer circles would indicate more independence in action. This factor then is an indication of the participant's level of self-regulation. "Research has shown that strategy training that includes meta-cognitive

components prepares students to know when and where to use it" (Schunk and Zimmerman, 1994:13).

The indication of a score for the ZPD was simply the reverse of the rubric in figure 15(c) below.

Meta-cognitive strategies evident during Adventure Activities		
Degree to which MCS are evident or used during an activity	Description of the scoring interpretation of evidence in action	Rating
High degree of evidence or use of meta-cognitive strategies. High degree of the use of ZPD (more circles)	Clearly the specified element features frequently while the participant is carrying out the task. Frequency means use according to the score and judgement of use during all the different actions taken during the activity. This is observed in the learner taking time to think and adjust his/her plan of action and approach to the task or may well be illustrated by self-confidence shown during the task. It may also mean self-adjustment of a plan of action due to verbal guidance from more capable instructors or peers. Consideration and allowance must also be made for the length of time the learner is engaged in the activity.	4
Moderate degree of evidence or use during activity. Moderate use of ZPD (circles)	Not as many times as the above count.	3
Lesser degree of evidence of use. Lesser use of ZPD (circles)	Significantly lower score that above and too much time used in relation to others.	2
No evidence of its use. No/very little use of ZPD	No good evidence of the use of elements or too many occurrences of use of ZPD.	1

Figure 15(c). The rubric used to interpret the measuring tool as given in, figure 15(b)

Table 15.1. below shows the rate at which meta-cognitive strategies are used by the sixteen learners who were observed as they engaged in different adventure-based activities.

The data in table 15.1 should be read as follows:

Rock-climbing, Grade 7 (P=4), means that during the rock-climbing activity the meta-cognitive strategy of planning had a high frequency of use, but (M=2) means that there was a lesser degree of the use of self-monitoring and (T=2) means also a lesser degree communication was used.

In grade 9, planning was also frequently used (P=4), self-monitoring much higher than in grade 7 (M=3), but (T =1) shows that there was no evidence of purposeful communication.

The symbol Z in the table represents the Zone of Proximal Development (ZPD) and means the number of times or frequency that the participant relied on peer or instructor help in order to move to the next level of action. In rock climbing in grade 7, the reliance on ZPD was rated at 4, meaning a high level of reliance on assistance from others but grade 9 rated at 2 implies much less reliance on others in that domain of activity.

The reliance on the ZPD is very marked in the group dynamic activities. Grade 7s rate at 4 and grade 9s at 1 showing that by grade 9 there is less reliance on the ZPD for the learner to progress to the next level of performance. This may well mean that by grade 9 learners have internalized the required learning and are able to apply the necessary meta-cognitive strategies (MCS). The other results show a similar pattern or trend emerging in the other adventure-based activities listed in the table below.

The rubric in figure 15(b) above was used to give the value and rating to all the evidence gathered from the sixteen learners as they engaged in the various activities. The results of these observations are displayed in table 15.1 below.

Activity	Description	Grade 6	Grade 7	Grade 8	Grade 9	High frequency of use in activity
Rock climbing	Use of meta-cognitive strategies that develop self-regulated learning		P =4; F =4 D= 4 ;V= 3 C= 3;B= 3; E= 3; M=2 T=2; Z = 4	P =4; F = 4 D= 4;E= 3 M= 3; V= 3 C= 2; B = 2 T= 2; Z = 3	P = 4; F = 4 M= 4; E= 3 V= 3; C= 3; B = 3; D= 3 T= 1; Z = 2	Self-planning Fear control Decision making Self-motivation
Group dynamics	Use of meta-cognitive strategies that develop self-regulated learning	P = 4; F = 4; D= 4;E=3; M=3; C= 3; B = 2;T= 2 V= 1 Z =4	P = 4; F = 4; D= 4; E= 3; M= 3; B = 3 C= 2; T= 2; V= 1 Z = 3	P = 4;E= 4 B = 4; D= 4 M= 3; C= 3; F = 3 T= 2; V= 2 Z = 2	P = 4;E= 4 C=4; T= 4; B =4; D= 4 M= 3; F = 3 V= 2 Z = 1	Self-planning Fear control Self-evaluation Self-monitoring Decision making Communication Problem solving
Abseiling	Use of meta-cognitive strategies that develop self-regulated learning	F = 4;P = 3 E= 3;M= 3; D= 3; C= 2; T= 2; B = 2 V= 1 Z =4	F = 4;P = 4 D= 4; E= 3 M= 3; C= 2; T= 2; B = 2 V= 1 Z =4	P = 4 ;E= 4 F = 4; D= 4 C= 4; M= 3 T= 3; B = 3 V= 3 Z =4	P = 4 ;E= 4 F = 4; C= 4; M= 3; V= 3 T= 3; B = 4 D= 4 Z = 2	Self-planning Fear control Monitoring self-confidence self-evaluation Communication Problem solving
Climbing wall	Use of meta-cognitive strategies that develop self-regulated learning	P =4; F =4 E=4 ; M=3; C= 2; D= 3 T= 2; B =2 V=1 Z = 4	P = 4; F =4 E= 4; M= 3; V=3 ; C= 2; T= 2; B =2 D= 2 Z = 4	P = 4; E= 3 M= 3; V=3 C= 2; F = 3 T= 3; B = 2 D= 2 Z = 3	P = 4; E= 4 M= 3; V=3 C= 3; F = 3 T= 3; B = 2 D= 1 Z = 1	Self-planning Fear control self-evaluation Self-monitoring

Table 15.1. Results of the observations of 16 learners engaged in adventure-based activities as they employ meta-cognitive strategies to carry out the activity are as follows.

15.6.4 Analysis of this data contained in table 15.1

1. A high degree of meta-cognitive strategies (MCS) was employed by these sixteen learners in order for them to complete their activities.
2. The most frequently used and obvious meta-cognitive strategy in these activities was the emotional element of the control of fear (F=4).
3. Other high frequency of meta-cognitive strategies were self-planning (P=4), self-monitoring (M=4), self-evaluation (E=4), decision-making (D=4) and problem solving (B=4).
4. What the above table of results does not show clearly is that in many cases the learners who did not initially employ planning strategies soon learned during the course of the exercise that planning, self-evaluation and monitoring, as well as coping with anxieties and conflict were critical to success. This was particularly evident during the group dynamic activities and was most probably due to the debriefing by the facilitator after each activity (self-analysis and evaluation) and then the re-planning/problem solving/decision making after each activity. This involved strong reinforcement, application and consecutive practice of the meta-cognitive strategies involved, and is a good example of learning in the ZPD.
5. Although communication was also a highly used strategy, the researcher found it difficult to determine how the use of language by the participant, the instructor, as well as the community of peers was part of the learner's self-regulatory capacity. In other words the researcher was unsure as to when to place the circle to signify the ZPD (needing outside input to move to the next level), as hesitations by the learners could well indicate a thinking process that was happening and not necessarily that the learner was waiting for assistance to go about the next move. This hesitation was sometimes interpreted by the instructors as a cue for help, but the researcher observed by chance that on some occasions when no verbal communication occurred due to some reason, the learner was still able to solve the problem or make the decision on his/her own, thereby taking him/her to the next level. The researcher noticed this more frequently with the older learners, possibly due to the internalization of meta-cognitive strategies (MCS).

6. When matched against the age or grade of the participant, the frequency of circles appears to decrease with increase in age or grade and may well be attributed to self-regulated learning that has occurred through the frequent use of meta-cognitive strategies during adventure-based activities.

15.7 Overall summary and discussion of the use of meta-cognitive strategies in adventure-based activities

All the data gathered through the various data collecting methods, i.e. narratives, participant observation, interviews and questionnaires was used to develop the table below. The purpose of the table 15.2 below is to reflect at a glance the frequency of use of the listed meta-cognitive strategies (MCS) as they evidenced themselves through all the data collecting sources, i.e. as the evidence was revealed by the learners, educators, instructors and parents relating to the specific adventure-based activities.

The ratings were arrived at in the following way: each individual batch of results was considered in terms of the amount of NMUs (Natural Meaning Units) that occurred (see page 135 for an explanation of NMUs). It must be remembered that this study has identified the NMUs as the meta-cognitive strategies (MCS) being observed in this research. The amount of meta-cognitive occurrences (frequencies) were recorded and then rated according to the rubric in figure 15(d) below.

This was done for each of the different adventure-based activities as they appeared in the data collecting methods. If there was a high occurrence of a specific meta-cognitive strategy then that would get a rating of four, next highest a rating of three until the rating of one would mean very little or no occurrence of that meta-cognitive strategy in a particular activity.

The scores shown in table 15.2 on the following page are according to the frequency ratings in figure 15(d) below.

Degree to which meta-cognitive strategies were used	Rating of the frequency
High frequency of use	4
Moderate frequency of use	3
Lesser frequency of use	2
No evidence of use	1

Figure 15(d) Frequency ratings.

Table 15.2.below reflects the scores as totaled according to all the above methods of observation and data gathering. For example: self-planning is most frequently used (4) in hiking, group dynamic tasks and eco-challenge races BUT is used least (2) in canoeing. The emotional control of fear is most frequently used (4) during rock climbing, abseiling, group dynamics, the zip wire and the eco-challenge racing BUT was least (1) used during shelter building on the survival camp.

The totals at the end merely indicate that the meta-cognitive strategy of decision making is most frequently (39) used in all activities, and controlling fear is least used (33). This must be viewed in terms of a possible highest score of 44. If 44 is taken as an index of 1 then the total of 39 will have a value of 0,88 and the total 33 will be 0,75.

The result for fear, however, appears to contradict the significance attributed to the element of risk in adventure-based activities. This can be explained in that many of the activities listed in the overall summary table below are not high risk or dangerous activities, but if the real or perceived high risk type activities are isolated, namely; abseiling, rock climbing, group dynamics, climbing wall, high wire and eco-challenge race, these would all reflect a high frequency of 4. This is supported by the results of the evidence shown by the observations of the sixteen participants during their activities which shows a frequency of 4 for emotional control of fear.

The above factors are detailed in the table below.

Meta-cognitive strategies (MCS)	1 Rock climb	2 Abseil	3 Hike	4 Can	5 Group dynam	6 Shelter building	7 Bridge building	8 Raft building	9 Climbing wall	10 High wire	11 Eco chall	TOTAL Occurr Ence
Self- planning (P)	3	3	4	2	4	3	3	3	3	3	4	37 = 0,84
Self-evaluation (E)	4	4	2	3	4	2	3	3	4	4	4	37= 0,84
Self-monitoring (M)	3	3	4	3	3	3	3	4	4	4	4	38= 0,86
Self-motivation (V)	3	3	4	4	3	2	3	3	3	4	4	36 = 0,81
Self-confidence (C)	3	3	3	3	4	3	3	3	4	4	4	37 = 0,84
Self-control, fear, conflict etc (F)	4	4	2	3	4	1	2	2	3	4	4	33 = 0,75
Communication (T)	2	4	3	2	4	3	3	4	2	4	4	35 = 0,79
Problem solving (B)	3	2	3	2	4	4	3	4	2	2	4	37 = 0,84
Decision making (D)	4	4	3	3	4	4	3	4	3	3	4	39 = 0,88

Table 15.2. Overall scores indicating the frequency of use of meta-cognitive strategies during adventure-based activities. A total index of 1, 0 will indicate a 100% occurrence.

15.8 Further discussion of table 15.2.

Table 15.2 above shows that if an index of 1.0 is regarded as the highest possible frequency of meta-cognitive strategies (MCS) then:

- Decision making (0,88) and self-monitoring (0,84) are the most frequently used meta-cognitive strategies (MCS) in an overall selection of adventure-based activities BUT
- In isolating the high-risk activities (columns 1, 2, 5, 9, 10, 11) control of fear has an index of 0,95 and self-evaluation an index of 1,0 and is therefore of a higher frequency of occurrence (see figure 15(c) compared with figure 15(e) below).

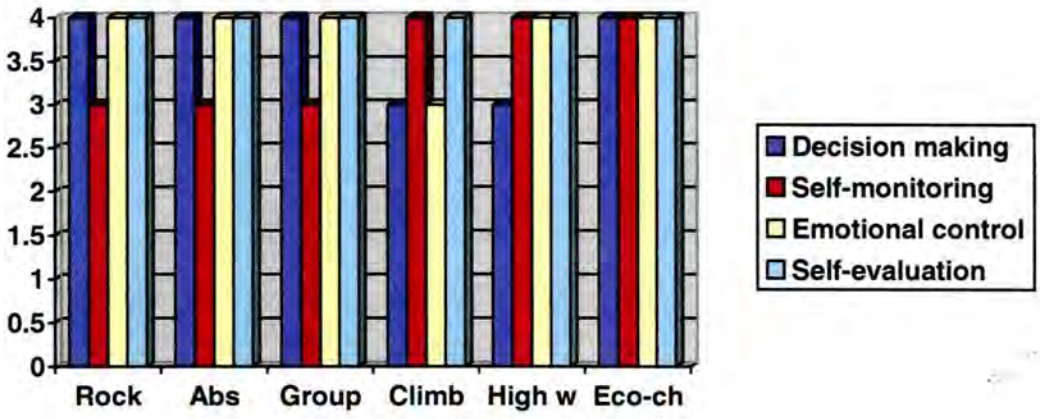


Figure 15(e). High risk activities

Six of the *high risk adventure-based activities* show the extent to which meta-cognitive strategies (MCS) are used in; rock climbing, abseiling, group dynamics, climbing wall, high wire and eco-challenge. The graph in figure 15(e) shows the frequency of occurrence of the meta-cognitive strategies of decision making, self-monitoring, emotional control (fear) and self-evaluation in the above listed adventure-based activities.

Figure 15(f) below, on the other hand, illustrates the frequency of occurrence of the same meta-cognitive strategies in five of the *less risky adventure-based activities*. These activities are hiking, canoeing, shelter building, bridge building and raft building. Clearly it shows less of an occurrence of the same MCS in these particular adventure-based activities.

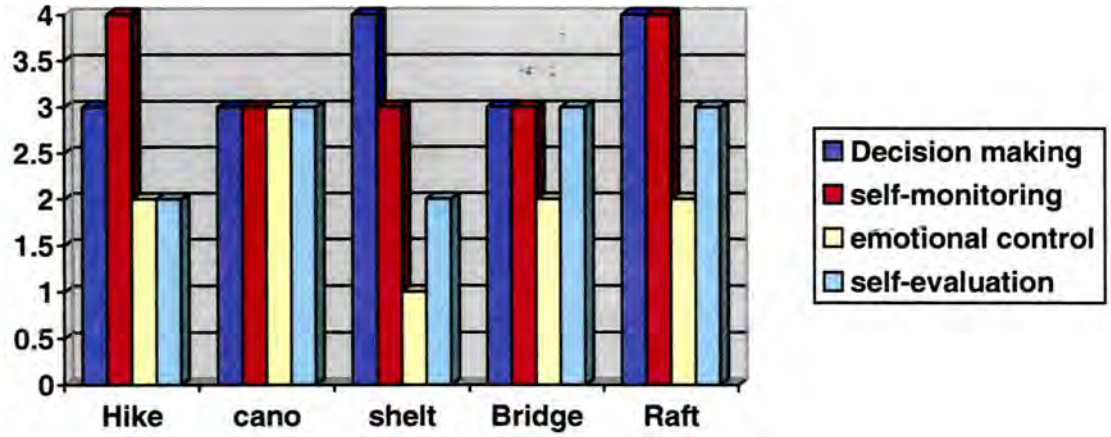


Figure 15(f). Low risk activities

- Some group dynamic activities are regarded as high risk, some require thinking skills and are reflected in the high occurrence of problem solving, communication and decision making MCS.
- Activities like raft, shelter and bridge building, have a strong technological base and this is seen in the frequent use of the MCS of communication, problem solving, decision making as well as planning .

15.9 Tracking of the six learners identified during the survival camp

15.9.1 The procedure and tools used

This exercise was referred to in chapter fourteen, pp150-152, and the information was gathered through the format and instrument, figure 15(g), which is explained below. This involved requesting parents, educators and the researcher to make observations of the six learners according to the criteria (meta-cognitive strategies) and performance indicators (a description of the strategies) and a rating (high use to very little use of the strategy). The goal behind this was to determine whether the learners in the opinion of the observers continued to use meta-cognitive strategies in their approach to other tasks undertaken in the school and in the home circumstances.

The instrument used to gather this information was a simple rating scale that was applied over a year, July 2003 to August 2004, and administered by the parents, the teachers and researcher at three different intervals. The instrument used is illustrated below in figure 15(f) and the observers concerned were required to judge the six learners in their specific contexts, i.e. class, school and home. The observers were required to use the tool below to determine the degree to which the learners relied on outside help to accomplish a task.

Please tick ✓ the column that best fits your observations of the following persons according to the criteria and descriptions below.
Name of learner: ..... Date of observations: .....

Criteria Meta-cognitive skills	Description of the meta-cognitive strategy/element	3 High use / of this element and needs no help.	2 Is used/ enhances life but needs limited help	1 Not much evidence of use and needs constant help
Self planning	The ability to set own goals and plan a strategy to do a task and solve problems.			
Self-monitoring	The ability to monitor or gauge one's own progress during a task. Independence in a task.			
Self-evaluation	The ability to objectively assess oneself and one's attempt at a task. The ability to read feedback to make adjustments to an approach to a task.			
Self-confidence and self-belief	Has self confidence to try new tasks on his/her own. Not afraid to make mistakes and adjust his/her approach through own assessment of their efforts. Will stand up and make his/her point in a group easily. Works well in a group situation.			
Emotional control	Able to handle and face fears, does not back off from a challenge or conflict and is able to diffuse or take positive charge in a conflict or anxious situation. Handles differences of opinion in well adjusted manner- no aggressive conflict but stands by his / her opinion. Works well in a group.			
Problem solving	Is a problem solver and is not reticent to take on a problem, clearly enjoys a challenge and usually has a sound outcome to his/her efforts in a task. Able to get others involved.			
Decision making	Is able to make decisions and stand by them. Is prepared to make a decision and take a chance on his/her decision. Usually innovates decisions during tasks. Involves others in decisions.			

Figure 15 (g). The Instrument used to record the use of meta-cognitive strategies used by the six learners.

The judgement was made according to the observed use of meta-cognitive strategies (MCS) as described in the descriptors in the instrument above. The observers were required to place a tick in the column that they found, according to their observation and judgment, was the most appropriate to describe the behaviour of the learner.

15.9.2 Discussion on this data collecting exercise

The researcher acknowledges the importance of the observer's awareness of prior behaviour in each context and the possible influence this may have on the claims that these observations over a period of time are not necessarily only due to the learning that took place at the survival camp. An important aspect that arises, however, from these observations is that these meta-cognitive strategies (MCS) are recognizable even to parents and educators who were not involved in the survival camp and their use is evident in these six learners' everyday behaviour as they go about daily tasks.

At no point does the researcher claim that the observable use of these meta-cognitive strategies (MCS) is directly due to the survival camp only, but rather that the observations made over time by the different observers in different contexts serve to confirm that these six learners are aware of these meta-cognitive strategies and do use the meta-cognitive strategies in attempting tasks. If the learning that happened on the survival camp, albeit through intervention (ZPD), served to create an awareness in the learners of the benefits of using meta-cognitive strategies (MCS) to help solve problems and they are clearly still used by the learners a year later; then a claim then could be made for the adventure-based experiences on the camp contributing to the learning that occurred in these six learners.

However, such a claim is weak as the learners are regularly exposed to using such adventure-based activities anyway through the Life Orientation programme offered at the school. The claim then should rather be that the awareness of meta-cognitive strategies created and originally observed at the camp has been sustained through regular application of these meta-cognitive strategies in the Life Orientation programme.

The instrument for rating the use of meta-cognitive strategies (MCS) used by learners as observed by parents, educators and the researcher is illustrated below in figure 15(h).

Description of the degree of reliance on others to accomplish a task	Rating scale
None to very little reliance on others to be able to accomplish a task	3
Limited help required to accomplish a task	2
Constant help required to complete a task	1

Figure 15 (h). Illustrates the scores as used in figure 15 (g) to gauge the amount of reliance learners have on others to accomplish everyday tasks.

Observers were required to make observations of the learners in the different contexts and make a judgment on their behaviours. This judgment was about how well the learners were perceived to cope with everyday tasks using the meta-cognitive strategies. This would give a sense of the learner's self-regulatory capacity in other contexts. The instrument then attempts to measure the degree of reliance that the learners place on others. This is an observable behaviour that the observer (parent, educator) could indicate according to the three levels as shown in figure 15(h) above.

The returns were analyzed and the researcher used the following guidelines to obtain an overall rating.

- When more than one educator was used to make observations and ratings, the researcher noted the highest number of ratings and used that rating as the indicator. This number was placed into the table below.
- If both parents returned the rating sheet, the highest rating was placed into the table.

The results of the observations made by the parents, educators and researcher are illustrated in table 15.3.below. This table represents the results of the ratings done of the

observations of the six learners' use of meta-cognitive strategies (MCS) gathered over a period of a year; this involved three feedback assessments using the instrument in figure 15(g) in which the learners were rated according to their reliance or non reliance on others in order to accomplish everyday tasks.

3= Very self-reliant : 2= Some reliance on others: 1= High level of reliance on others

Observers of the learners: P= Parent: E = Educator: R = Researcher

	Learner 1 C...			Learner 2 B...			Learner 3 G...			Learner 4 S...			Learner 5 A...			Learner 6 D...		
Meta-cognitive strategies (MCS)	P	E	R	P	E	R	P	E	R	P	E	R	P	E	R	P	E	R
Self-planning	3	3	3		2	3	3	3	3		3	3			2		3	3
Self-monitoring	3	2	3		2	3	3	3	3		3	3			2		3	3
Self-evaluation	3	2	2		2	3	3	3	3		2	2			2		2	2
Self-confidence	2	3	2		2	2	2	3	3		3	2			1		3	3
Emotional control	3	2	2		2	1	2	3	3		3	3			2		3	3
Problem solving	2	2	2		2	2	2	3	3		3	3			2		3	3
Decision making	3	3	3		2	2	1	2	2		3	3			1		3	3

Table 15.3. Observations of 6 learners' levels of reliance on others in everyday tasks

15.9.3 Observations of the results in table 15.3

- The learners' use of these meta-cognitive strategies/elements/skills appears to be sustained in the class and home contexts.
- A high degree of independent or self-regulatory ability is evident throughout these observations made by parents, educators and the researcher.
- Unfortunately not all evaluation sheets were returned in order to make this case stronger.
- These results have been included for interest sake and not for any empirical result.

15.10 Reflections on this chapter

This detailed analysis of the various adventure-based activities as illustrated in chapters ten to fifteen provides very convincing evidence to show conclusively the application of these meta-cognitive strategies (MCS) in the various adventure-based activities as explained in this study. The evidence obtained from the data collection techniques also shows:

- The consequent learning of these meta-cognitive strategies and how they are used in other adventure-based contexts. Strong evidence for this is the success that the Lilyfontein School teams achieved in the South African Inter schools adventure race held in September 2004. Lilyfontein School achieved a first place in the senior division and second and third place in the junior division. Lilyfontein School won the senior division in 2005 out of a field of 50 school teams.
- Adventure racing requires the use of the whole range of meta-cognitive strategies (MCS) to be able to complete the required components, which are grueling, tough and over a distance of ± 55 kilometres. In particular, meta-cognitive strategies like: planning, communication, team work, self-assessment, emotional control of fear, emotional control of fatigue, self-monitoring, self-discipline, conflict control and decision making.

- This study makes a strong case for the effectiveness of the ***affective learning experiences*** that the learners are exposed to in these adventure-based situations, in the form of emotional control, commitment, attitude or self-management. Learners learn to face fears and find meta-cognitive strategies (MCS) to help them cope in difficult situations and in situations that require re-planning and change. Conflict management and emotional control during group dynamic activities is also critical to the groups' success.
- Another critical component is that of improving self-confidence or in building positive self-esteem. Many instances in this study highlight how learners' "self-confidence" has improved and studies generally indicate the impact that positive self-esteem has on an individual's ability to be a self-regulated learner.
- Being able to plan, evaluate, monitor self-progress and initiate self-improvement strategies during tasks are meta-cognitive strategies (MCS) that are frequently encountered in the rigours of adventure-based activities.
- Problem solving and decision making skills are regularly required during these activities and have real and serious consequences in activities like rock climbing, abseiling, canoeing, orienteering, etc. where the capacity to self-regulate is very relevant.
- Learners learn the skills of coping within a team context, communication, feedback, conflict management and co-operation in order to have successful outcomes of their objective. In this way they develop valuable life skills.

The aim of this research was not to make generalizations or enumerate frequency, but rather to provide sufficient detail about the context and the processes of the research to allow the readers to make judgments concerning the applicability of this study to other contexts.

This study is **significant** in that it provides a theoretical proposition relating to the mediational value of adventure-based activity experiences in developing self-regulated learners (see chapter sixteen). This study is also **unique** as it uses activity theory (rather than experiential learning theory) to give a more detailed analysis of activity systems as found in adventure-based activities, in order to formulate this theoretical proposition.

Chapter 16

Conclusions and recommendations

16.1 Preamble

This study looks at adventure-based activities as an educational tool or method of mediating or facilitating learning. The context to gather the required evidence is the activity system of Lilyfontein School, where adventure-based programmes are being piloted . With this consideration this study aims to find support for the claim that adventure-based activities included in the Life Orientation curriculum help to develop self-regulated learners. In doing this the evidence gathered in this study:

- Reflects the benefits of learners mastering meta-cognitive strategies as a vehicle for becoming better self-regulated learners
- Underpins a sound argument for the continued use of adventure-based activities within the school's curriculum to mediate self-regulated learning experiences.
- Highlights the relevance of the adventure-based programmes offered at the school in validating the meta-cognitive learning strategies embedded in the National Life Orientation curriculum for both the GET and FET bands.

16.2 Background to the study

Historically Outdoor Education provided an alternative methodology or approach to learning that was not classroom based. Its intention was to provide an experiential approach to learning but in many cases the outings were academically orientated 'outside classrooms' which were heavily reliant on worksheets. This simply meant that the methodology had merely been translocated to another environment. In some instances, however, genuine adventure type activities were being conducted.

Adventure-based education has its roots in the Outward Bound movement pioneered by Dr Kurt Hahn. Its philosophy was to develop in the participant self-confidence and a positive self-esteem through the exposure to real risk type activities. Currently the 'Adventure Industry' appears to be a very popular alternative to the conventional sporting

codes. Apart form the activities mentioned as part of this study, adventure-based activities also incorporate a range of more extreme type adventure experiences such as extreme sports, white water rafting, paragliding, summiting, eco-challenges, survival challenges, bungy jumping, base jumping or mountain biking. Conventional adventure-based activities like rock climbing, bouldering, kloofing, abseiling, canoeing, cycling and kayaking appear to be done in many situations. The media documents many such programmes on a regular basis. These adventure-experience programmes are usually offered by private companies or Non Govermental Organisations (NGOs) and some schools may use the services of such groups to offer leadership, team building and self-development programmes to their learners.

16.3 Available Research

Although many schools, clubs and corporate organizations expose their members to these adventure-based activities as part of their personal development or team building experiences, not much empirical research on the sustained benefits of these activities is evident. What is clear, however, is that very little rigorous research evidence is available as to the nature of the learning benefits of such activities for the participants (see chapters two and three). Many opinions are offered by the usually enthusiastic and passionate proponents of these activities. Although such opinions are based on the subjective observations of participants and according to qualitative researchers may well provide valuable insight into the effects of these experiences, these observations are usually over short periods of time. This means that very little evidence concerning what actual learning takes place or much conclusive evidence of the sustained effects and benefits of such experiences appears to be available.

The tool used to observe the sixteen learners during rock climbing, abseiling, canoeing and group dynamics activities provided strong evidence of the learners' use or non use of meta-cognitive strategies. This is seen in table 15.1, on page 269. This enabled the researcher to see which learners were still operating in the ZPD or, on the other hand, which were able to operate independently when using meta-cognitive strategies.

16.4 Evidence to affirm the role of adventure-based activities in developing self-regulatory learning.

The empirical evidence for affirming the role of adventure-based activities in developing self-regulated learners is revealed in particular through the evidence gathered from in-depth participant observations in this study. Engeström's activity theory provided a fairly comprehensive tool to analyze this data in the context of an activity system. To complement its shortcomings (as highlighted in chapter five), this study has gone further in using meta-cognitive elements (MCE) to identify meta-cognitive strategies (MCS) that, in the opinion of the researcher, enabled self-regulatory behaviour or action.

In this study the notion of *meta-cognitive elements* (MCE) is used as a concept definition whilst *meta-cognitive strategy* (MCS) is used more in the context of the application of the concept during an action. The researcher for the purpose of this research views the use of meta-cognitive strategies (MCS) as indicators of self-regulatory learning, but more importantly, as strategies to enhance self-regulation in a learner. According to Corno and Mandinach (1983:95), self-regulated learning is an effort to deepen and manipulate the associative network in a particular area (which is not necessarily limited to academic content), and to monitor and improve the deepening process. It is the meta-cognitive strategies (MCS) that act as a tool to enable learners to be more effective in the completion of an activity. This dynamic can be observed when a 'contradiction' (Engeström) occurs between elements of an activity system and the participant [subject] is faced with coping with a problem, reflecting on the situation, re-planning, dealing with fear, managing an emotion, making a decision, self-motivating, self-evaluating, self-monitoring, and showing 'guts' to complete the task [object]. This study also recognizes the importance of a positive self-belief and self-efficacy as the task unfolds. The significance also of the other members of the activity system's community or its division of labour, in providing feedback and encouragement to this end, is critical.

Schunk's (1983, 1984, 1989) (also see p.55) research experiments show clearly that attributional feedback (information that allows a learner to develop positive self-belief of ability) is critical to self-efficacy which contributes to self-regulated learning. Most

studies show a positive correlation between ability attributions and self-efficacy (Schunk, 2000:87).

This attributional feedback can be illustrated by the following from a group dynamic scenario:

1. The learners are given rules of participation, they begin the task but are penalized as they had not listened to the instructions. When they move to the next task they very quickly tell each other to listen to the instructions, thus improving their performance.
2. During the first attempt at the see-saw task the participants break contact and are penalized. They re-group and re-plan but this time they are all aware of what each person needs to do. They accomplish their goals. In the next task they simulate in their planning what they propose doing. They score higher in the next task through a better performance as a result of reflection and problem solving (MCS) from the previous task. This is shown in table 13.1, p. 222 and graph on p. 232 where scores have increased by the last group dynamic activity, showing a greater use of MCSs when doing their final activity (expansive learning cycle, see p. 90).
3. During an inter-schools event the researcher observed the following dynamic between the four members of the adventure race team (this was a chance observation and not planned). The teams were given their instructions in which they had to do four events, namely: cycling, cross-country, Jacob's ladder climb and orienteering. The events could be done in any order but planning was vital to avoid bottlenecks and time wastage. The teams from the other schools (no prior experience in this field) were too hasty and mounted their cycles and rode off only to find out that they had gone in the wrong direction. The group who had been exposed to group dynamic activities and adventure activities spent a few minutes getting clarity from the team before they decided to choose their first activity. They even planned their transition points (this is the change-over made from one mode of activity to another: e.g. cycling to running or paddling) and their water stops which as it turned out they had to re-evaluate and change during the course of the event. This kind of thinking or meta-cognition puts participants at an

obvious advantage contributing in this instance to a positive experience for this team.

The use of meta-cognitive strategies (MCS) like communication, planning, re-evaluation, task monitoring, etc. was evident as the learners in this team were familiar with using these strategies to make for a better performance. The parents, educators and even the learners acknowledge in their responses that these adventure-based experiences help them to become more independent, take responsibility, plan better, monitor their own actions in tasks, increase their self-confidence, helps them face and overcome fears and also to have the confidence to take charge in situations requiring action. These are meta-cognitive strategies in action and consequently indicators of self-regulatory learning.

16.5 Pedagogical value of these empirical findings

Schunk and Zimmerman (1994:310) make recommendations for a greater emphasis on longitudinal studies in self-regulation as most self-regulation studies have been of short duration. They continue to say that simply teaching learners strategies does not guarantee that learners will continue to use them.

The findings in this study show a very strong support for self-regulatory skills being developed through adventure-based activities, and it is the contention of the researcher in this study that this may well be due to the following points: (1) Adventure-based activities have a high degree of real risk involved and therefore the strategies available to the participant to accomplish the task are vital to safety and (2) An adventure-based activity is not a low risk simulated class room type experience, it is the real thing. If you make a mistake because you did not listen, plan, check your route, monitor your progress or foothold, stick to the rules or listen to the instructor (unlike an educator in class), it may well be a tough consequence or even a fatal mistake and therefore the learning urgency is greater. When hanging upside down in a harness from a zip wire 8 m above the ground, problem solving and decision making are real and therefore serious.

The importance of the instructor operating in the ZPD plays a significant part in developing self-regulation. Evidence in this study shows that through regular use and

successful exposure to these kinds of activities learners can become better self-regulated learners. Evidence gained from educators and parents shows that there is some carry over into other domains of learning in class and at home. Schunk (1994:8) suggests that self-regulated learning can be enhanced by providing learners with attributional-feedback that links their success with their effort and abilities. Learners are then able to learn that their abilities can be influenced by their efforts and it is this belief that is hypothesized to influence performance.

16.6 Learning self-regulatory or meta-cognitive strategies

Chapter four, p. 58, shows the importance of self-esteem or self-confidence in being a successful self-regulated learner. This is also borne out by the high regard that the learners, parents and educators place on the development of self-confidence through adventure-based experiences. Self-confidence appears to permeate into most other learning situations.

Coopersmith (1967:194) states that research lends considerable support to the theoretical view that a positive self-concept and high self-esteem are likely to result in higher achievement, and more negative beliefs and feelings are likely to be associated with failure. The findings in this study that adventure-based activities result in a marked improvement in self-confidence and positive self-belief in a learner supports this view. Through the influence of meta-cognitive strategies learned through adventure-based activities improvements of learning in other domains of learning are possible.

Developing self-regulation by direct classroom instruction of meta-cognitive strategies seems to be a very difficult task. Vygotsky (1978) points out:

> Pedagogical experience demonstrates that direct instruction in concepts is impossible. It is pedagogically fruitless. The teacher who attempts to use this approach achieves nothing but a mindless learning of words, an empty verbalism that stimulates or imitates the presence of concepts in the child. (Vygotsky 1978:170)

Vygotsky then continues to point out the importance of the individual's development of higher mental functions. In an adventure-based activity the instructor initially takes learners through the ZPD and plays a primary scaffolding role, but with practise the

learner is able to cope more independently. Learning has been internalized even to the extent where the learner may play the scaffolding role as the instructor.

> All higher mental functions are mediated processes. A central and basic aspect of their structure is the use of the sign as a means of directing and mastering of mental processes...[higher mental functions] are an aspect of the child's cultural development and have their source in collaboration and instruction... initially these [higher mental] functions arise as forms of co-operative activity. Only later are they transformed by the child into the sphere of his own mental activity. (Vygotsky 1987:168)

If according to Vygotsky the learning that happens initially through the ZPD eventually translates into higher mental functions, then we could well reason that the learning of meta-cognitive strategies in performing tasks in adventure-based activities may well transfer into other areas as it ought to have become part of the learner's higher mental functioning. This would by inductive reasoning imply that these learners would become better self-regulated learners in all domains of learning.

As early as 1986 Zimmerman and Pons indicated that:

> Although extensive research has been conducted on the use of self-regulated learning processes in laboratory situations (e.g., Bandura & Schunk, 1981), few efforts have been made to measure the role of self-regulated learning processes in naturalistic settings, particularly in non classroom contexts. (Zimmerman & Pons, 1986:615)

16.7 Affirming the use of activity theory in which to ground adventure-based learning.

Adventure based learning is traditionally grounded in experiential learning theory. Experiential learning theory, as pointed out in chapter five, p.68 has serious limitations. Taylor and Bogdan (1984:126) refer to the grounded theory approach as a method for discovering theories, concepts, hypotheses, and propositions directly from data, rather than from a priori assumptions, other research, or existing theoretical frameworks. This research has used Engeström's activity theory to view and analyze action in adventure-based activities and therefore has chosen to make a proposition for a post research grounded theory rather than a pre-research hypothesis. Although according to Miles and Hubeman (1984:75) they serve the same purpose, the nature of answers to the questions

asked in this research are grounded in the data generated by the observations of learners' actions as they engage in adventure-based activities and analysed through activity theory.

According to this research, there appears to be very little, if any, prior theory in the domain of meta-cognitive learning in adventure-based activities. This may well be an advantage in that, as Maxwell (1999:54) says the main drawback of explicitly formulating hypotheses is that, like prior theory, they can act as blinders, preventing the researcher from seeing what's going on.

The main aim of this study was to investigate the influence that adventure-based activities have on self-regulated learning. The study went about looking for evidence that would show that meta-cognitive strategies (MCS) are used as tools or strategies during adventure-based activities in order to complete or be more successful at the tasks being conducted. Meta-cognitive strategies are regarded as very important elements of self-regulated learning (Zimmerman, 1989:3). This study has been able to identify the action components of adventure-based activities and relate them to the six domains of Engeström's activity theory triangle. The action of the participant as well as the influence of the components of the activity system on each participant could then be observed and recorded as these learners use meta-cognitive strategies (MCS) to successfully complete an action. It follows then that the substantial evidence of the frequent use of these meta-cognitive strategies in action makes a strong case for the proposition that: **Regular participation in adventure-based activities helps to mediate the development of self-regulation in learners through regular use of meta-cognitive strategies when engaging in the activity. This assumes the critically important part played by attributional feedback from other people in the activity system to ensure self-efficacy and consequently a sense of self-confidence in the participant.**

The evidence contained in this study shows a very high use of meta-cognitive strategies (MCS) during the specific adventure-based activities that have been analyzed. And the regular use of these strategies as part of the Life Orientation programme reinforces the self-regulatory learning opportunities. Observations made by parents in the home context and by educators in the classroom situation appear to support these findings and in

particular the notion that adventure activities seem to improve self-confidence through self-belief and self-efficacy. This in turn seems to improve the learners' observed performance in a range of tasks. The question then is whether these observations and the evidence collected are reliable enough indicators of self-regulated learning that occurs as a result of adventure-based activities.

16.8 Limitations of this research

In chapter fifteen (p. 260) the researcher made the point that this study did not focus on the meta-cognitive element of **self-motivation,** but acknowledges its importance. Previous reference has been made to Zimmerman (1989) who describes self-regulated students as the degree to which these learners are meta-cognitively, motivationally and behaviourally active participants in their own learning. Schunk (1994) says that helping learners become self-regulated learners is an important educational task. But as Alan Winfield (1994:101) points out, many learners do not become self-regulated learners and these students do not attain their educational goals and in fact may not even have any important goals for education. Winfield (1994) gives a possible reason for this: that some learners just do not value learning. This factor may well influence the learner's attitude towards the adventure tasks and consequently meta-cognitive learning.

This research is certainly influenced by the context in that the learners who apply for admission to Lilyfontein in the first place understand that they are required to participate in adventure-based activities. They most likely have an affinity for the activities, place a value on participation and therefore are more motivated.

According to Winfield (1994:102) children's valueing of achievement tasks relates to more specific processes associated with self-regulated learning, including the appropriate use of cognitive strategies, degree of effort and degree of persistence. Garcia and Pintrich (1994:133) take this further in stating that researchers in student motivation argue that motivation is crucial to learners' use of self-regulated learning strategies and to their school achievement. Winfield quotes Kuhl (1994:114) saying that when learners are interested in and place value on a task they are likely to attend to it better, use more

information processing strategies and be more in control of their emotions so any setback would not throw them off track. Consequently, their motivation would be focused on continuing with the task. It follows then that the odds are stacked in favour of the learners at Lilyfontein School in showing more positive use of meta-cognitive strategies and more self-regulated capacity in adventure activities, specifically. This research does not attempt to predict that similar findings would prevail in different contexts.

This contextual factor implies two things: firstly that the findings in this research may well be limited to learners who place a similar value on adventure activities and are therefore more motivated and secondly that this study does not and cannot claim that self-regulation in adventure activities transfers into other contexts.

One of the factors emerging from the range of different learners during the interviews and discussions in this research is how the learners enjoy their adventure-based activities, adventure days or the adventure camps. Clearly then, a factor that always needs to be kept in perspective when reviewing the evidence of this research is the degree to which the learners value their participation in adventure-based activities. This in itself could be attributed to a number of factors like novelty, just being out of the class room, or the relationship with or role model of the instructors. These factors are not pursued in this research.

Another serious limitation of adopting an adventure-based approach into a school is characteristic of most educational settings: the human factor. Sadly such educational innovations are highly dependent upon a sincere, enthusiastic, passionate and experienced educator who can ensure continuity within the school. If it is only dependent on one educator and there is a lack of 'buy in' by all educators, the SMT and SGB an adventure-based programme will struggle to make an impact and serve the intended purpose as described and verified in this research.

16.9 Recommendations for further research

Research often raises more questions than answers. Here are some ideas emanating from this study

16.9.1 Ideas directly related to this research

Immediate questions include whether the meta-cognitive strategies as used in this research are reliable enough indicators of self-regulation in other adventure-based contexts? Will the tools used in this study give similar findings in different adventure-based situations?

Another area of investigation could be to establish whether the findings in this study transfer to contexts that do not have an inherent value for adventure-based activities. Findings in this research show a positive leaning / bias in favour of the transfer of self-regulated learning within the adventure-based context. Further research to monitor the effect of self-regulated learning transfer into more cognitive or 'subject based' learning situations is necessary. Specific measuring tools would have to be designed to capture such relevant information.

The cognitive domain may well include the impact of adventure-based (outdoor type) learning on reading ability, number development and comprehension capacity through observation. Howard Gardner (Jensen, 1995:128) postulates eight intelligences: linguistic, logico-mathematical, spatial, kinesthetic, musical, inter-personal, intra-personal and naturalist intelligence. These "intelligences" may well be an interesting area of investigation as to the extent to which these different intelligences are supported through adventure-based experiences.

Gardner's domain of intra-personal intelligence relates strongly to Daniel Goleman's (1998:317) concept of emotional intelligence (EQ). Goleman (1998) lists five basic emotional competencies to success in later life self-awareness, self-regulation, motivation, empathy and social skills. The rigours of adventure-based learning may well

contribute to 'emotional intelligence'. The extent and nature of the impact of adventure-based learning on EQ would need to be investigated more thoroughly.

16.9.2 Ideas indirectly related to this research

An area of investigation that could possibly make a valuable contribution to education is researching the part that can be played by adventure-based activities as an intervention in the domain of *learning disabilities.*

> Learning disabilities is an umbrella term coined in the 1960's to cover the many children who were failing school subjects. Specific learning disability means a disorder in one or more of the basic psychological processes involved in understanding. (Bootzin *et al.,* 1993:458)

Terminology has changed regularly to fit this condition; disability, handicap, learning disorders, etc., and currently we talk about barriers to learning. More specifically the condition, Attention Deficit Hyperactivity Disorder (ADHD) is very current in schools throughout the world. ADHD presents in two ways, firstly as impulsive, poorly self-monitored behaviour and secondly in problems of attention, short memory and learning deficit (Green, 1997:3).

> The dysfunction of ADHD is though to be due to an imbalance in the brain's neurotransmitter chemicals, noradrenaline and dopamine. This imbalance is mostly found in those parts of the brain responsible for self-monitoring and putting the brakes on unwise behaviour (frontal lobes and their deep connections, which are basic ganglia circuits). (Green, 1997:3)

Observations in this research shows that with some of the hyperactive or attention deficit difficulties experienced by the ADHD students the adventure-based experiences appear to reduce both the hyperactive and attention deficit conditions in the immediate situation. Cases have also been reported by educators at Lilyfontein School that learners who have become focused in an adventure area (paddling, cycling, adventure racing) show some form of behavioural improvement in the class context. One of the learners (who's voice is used in this study) progressed to being an adventure leader, changed his attitude completely and showed a remarkable improvement in his scholastic performance. He is now attending an adventure school at tertiary level to use his success as a vocation. This

may well be related to the meta-cognitive strategy of self-monitoring and self-efficacy as shown in this study to improve through adventure-based activities. These observations and cases need to be monitored, measured and recorded to determine their validity and significance for learning theory in education.

This research acknowledges the importance of the development of *self-discipline* in adventure-based learning. Veugelers & Vedder (2003:379) regard self-discipline as part of values education as a 'regulative value'. This research has not addressed the concept of values education. Professor Kader Asmal, the then Minister of Education in South Africa made the following remark in an Education Department's report on values education (2000:3), " The moral fibre and value systems of our people are constituted and reconstituted in our schools, in our places of worship, on the sports fields and at the work-place". Perhaps the possible impact of adventure-based learning on values in education needs to be investigated.

Finally, the necessity of a more in-depth study being conducted into the relevance of the findings in this study to the requirements of the National Curriculum Statements (NCS) particularly in the Further Education and Training (FET) band.

16.10 Final reflection on this research study

In chapter five it was stated that the nature of this study was to answer two salient questions, which in a sense are regarded as the goals of this study:

Question 1: Do learners who engage in adventure-based activities acquire meta-cognitive strategies which help them become better at self-regulated learning?

The evidence in this research clearly shows that adventure-based activities offer very real learning experiences for participants. This study has measured the frequency of application of meta-cognitive strategies in adventure-based experiences. Meta-cognitive strategies are used regularly during adventure-based activities to improve on performance. Observations in this study provide evidence that learners become self-reliant and independent learners the more they use the meta-cognitive strategies (MCS)

and in so doing become better self-regulated learners. Cases of participant improvement in this study are numerous. However, the researcher feels that recent observations on three different occasions outside of the intentions of this research may have some significance to the validity of the claims in this research.

Occasion one: The grade 11 learners from Lilyfontein School attended a leadership camp in 2004 at a well known adventure center site in the Eastern Cape province and were complemented more than once by the camp staff on how efficient the learners were in the tasks that were undertaken. Their application of "life skills" is well developed.

Occasion two: The grade 12 leadership group also attended a leadership camp in 2005 at another well known adventure center and the comments from the instructors were how quickly these learners solved the problems, and combined in the team building tasks. Their communication, reflection, planning, self-evaluation and decision-making strategies were clearly superior.

Occasion three: The Lilyfontein adventure racing team's winning of the National Eco-challenge race of 55 km in 2005 and 2006 must indicate that the regular practising of these vital meta-cognitive strategies does improve the necessary skills that increase the competence of the participants as they engage in adventure-based activities, particularly under very challenging circumstances.

Question 2: Can a well-structured adventure-based programme fulfil certain Learning Outcomes and requirements of the Life Orientation National Curriculum Statements?

Chapters seven and nine analyze the National Curriculum Statements for Life Orientation and show that meta-cognitive strategies as defined and used in this research occur in all of the Assessment Standards of the prescribed Learning Outcomes and range in occurrence from a possible 100% down to 46%. How these meta-cognitive strategies or skills manifest themselves in the context of adventure-based activities would depend on the design and content of the adventure-based activities used in a school's programme. The high percentage of meta-cognitive elements written into the National Life Orientation Curriculum must imply that meta-cognitive strategies play a significant role

in the underlying philosophy of the National Department of Education. The Department of Education has advocated the use of constructivism as the underlying philosophy of the South African model of Outcomes Based Education (DoE, 2000:11). Constructivist teaching requires that instructional planning, activities and evaluation strategies must reflect how previously learned knowledge and experiences (prior learning) influence new learning (Caffarella, 1992). Meta-cognitive strategies are a prerequisite to developing learners that will cope with the constructivist demands of Outcomes Based Education which are meta-cognitive in nature.

What is abundantly clear from the evidence of this study is that the current Life Orientation Curriculum Statement gives scope for adventure-based activities to be used as a vehicle to achieve components of the Learning Outcomes and Assessment Standards. This evidence, collected by the continuous action research process conducted over the last three years, strongly supports the curriculum decisions made at Lilyfontein School. Furthermore, the FET/NCS Resource Book for School Management Teams (SMTs) (DoE: 2005) point out that the principles of the NCS refer to the integration of three competencies: foundational competence (which is knowledge), practical competence (which are the skills) and reflective competence (critical self-analysis). This study highlights the use of meta-cognitive strategies (MCS) as an important tool to aid self-regulated learning. Based on the findings of this study it is the conclusion of this research that the NCS's **reflective competence** and this study's notion of **self-regulated learning** may well be one and the same thing, conceptually.

Assuming that this observation is accurate and that self-regulated learning is the process whereby learners systematically direct their thoughts, feelings and actions towards the attainment of their goals, (Schunk, 1994) the self-regulated learning that happens through adventure-based programmes is particularly relevant to the Life Orientation component of the National Curriculum Statements. The nature and value of an adventure-based learning experience, as this study shows, is worth educational attention. The SMT and SGB of Lilyfontein school recognizes this educational value and will endeavour to enhance their curriculum with an adventure-based programme that is continuously evaluated and developed.

16.11 Conclusion

This study set in the context of formal schooling provided unique opportunities to investigate an aspect of learning that in South Africa has been largely ignored. Further to this, grounding activities (generally seen as leisure activities) in the context of the activity theory has provided interesting insights into the possibilities of this theory in the current educational dispensation. The empirical findings in this study illuminate the valuable learning of meta-cognitive strategies during experiences provided by adventure-based activities within the school curriculum. Objective observations and scientific analysis of the learners' use of meta-cognitive strategies during adventure activities and the subsequent improvement in their performance in the ensuing tasks is substantial evidence to show that self-regulatory learning has occurred.

Activity theory considers all the influences within the system of action that mediate the learning that occurs and thereby providing focus points where meta-cognitive strategies can be applied in order to promote self-regulated learning. The current OBE curriculum in South Africa is driven by constructivist theory; activity theory, in the opinion of the researcher, provides a tool for an educator to analyze an action, identify or pinpoint contradictions and then encourage the use of meta-cognitive strategies to mediate more accurately the learning that ought to take place. In this way construction of knowledge or skills may well be mediated through improved self-regulation.

The essence of this study is captured succinctly in the words of a grade eleven learner at Lilyfontein School:

> **" I think we benefit tremendously from adventure activities at school. Not only physically and mentally but it emotionally balances our lives. Adventure also gives us a chance to overcome our fears and take our minds off the bad things most teenagers have to face. Adventure helps build character and also creates responsibility because of the danger of the activities. It has definitely changed my life and will change many in the future".**

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Appendices

Appendix A

RULES FOR INITIATIVE TASKS AND GROUP DYNAMIC ACTIVITIES

Rationale behind initiative tasks and group dynamics:

The idea of "co-operational learning" (not co-operative) is to give opportunity to practice, through group interaction, certain meta-cognitive techniques. Meta-cognition is about thinking about one's own thinking. Meta-cognitive techniques are critical to becoming effective learners and users of life skills.

Learners are placed in a situation where a task has to be carried out to accomplish specific goals or outcomes. Techniques such as; listening and communication skills, planning and goal setting, evaluating and reflecting on an action, changing a strategy and then being able to review (think about) their weaknesses and strengths to find ways of improving their efforts. This also involves problem solving and decision making during such activities. It also involves self-discipline, responsibility and other affective skills (emotional and psychological coping) necessary to accomplish this task.

A critical aspect is to encourage learners to use language to identify/recognize a problem and then express these problems verbally so that changes can be made to a strategy (way of doing things) that is not working (This may be done collectively or independently).

The tasks are certainly physical but also provide a strong mental learning experience if facilitated properly. An important aspect is the debriefing or review that is lead by the facilitator at the end of the task. This is meant to raise the learners' awareness of things that happened during the activity and how they need to rethink or change the approach they used. This can be done by open ended questioning from the facilitator and using the answers and observations from the learners to help the group to improve their performance, better planning, listening, communicating, co-operation, reviewing, evaluating, re-planning or re-doing, encouraging, etc. to shift their thinking to another cognitive level. This is about more accomplished practitioners helping learners to construct new ideas, ways of doing things and creating new paths for learners to use in solving problems.

Instructions for facilitators:

- Explain to the group the objective of the task.
- Tell them they must listen to the instructions to be given (use the rules for each task)
- They can then discuss for one minute to see if they understand the task requirements.
- After this they may only ask three questions for clarity.
- Then they must get started.
- Facilitator observes and records performances, interactions, timing and keeps the score of the minus points.
- Facilitator must not advise or interfere, let learners solve their own problems. They have been given time to understand the task but if the instructor feels he/she was not clear then input marginally.
- Do a brief debrief/review at the end of the task in order to get learners to see what they need to work at in order to improve.

1. TASK: SEE-SAW CROSSING

Objective: Get your team across the see-saw in two different ways.
Rules:

1. Must cross in a seated and standing position.
2. Must be in contact with team member all the time (- 1 per break)
3. Get off one at a time at end but still in contact. (all jump off -5)
4. Return to other side in different way.
5. If fall off (-5) and start again.
6. Feet may not touch ground when on the see-saw (-2 if touch).

- Do a brief debriefing/review to get learners to see what they need to work at improving.

Adventure group dynamic: Participants [subject element] working as a team to cross the see saw [object element] activity must be linked [rule element) throughout the activity.

2. TASK: NEGOTIATING THE SPIDER'S WEB

Objective: Get your entire team to the other side of the web (make up any story, electrified, sticky, etc depending on age group).

Rules:

1. May not walk around the web (-10).
2. May not touch the poles on the sides (-5).
3. May not touch the ropes (-2 per touch).
4. May not take more than one person through a gap, each person must be taken through a unique gap, only two at ground level. (-5).

- Do a brief debriefing/review to get learners to see what they need to work at improving.

Negotiating the spider's web. Object to get members of the group (subject) through a gap in the web without touching (rule) the rope (tool).

3. TASK: RIVER CROSSING

Objective: Get your entire team from start point to end point.

Rules:

1. Use only the two poles to help you across.
2. Need to be linked with your team-mate all the time (-2 per break).
3. Fall off (-5) and start again.
4. May not jump across at any stage you must walk off from the pole or beam.
5. Remain linked until all your team is off.

- Do a brief debriefing/review to get learners to see what they need to work at improving.

Adventure group dynamics: Participants [subject] negotiating the river crossing [object] must not touch [rule element] the water [tool: environment]

4. TASK: POLE CROSSING

Objective: Get your entire team over the pole.

Rules:

1. Practice on shorter pole, then do middle pole.
2. May not touch pole on sides (-2 per touch).
3. Once over may not help others to get over only secure people on the other side by holding the foot.
4. Each person that does not cross (-5).
5. Each learner must 'stand-by' to ensure the safety of their team members. (may hold the foot of the person seated on top).

- Do a brief debriefing/review to get learners to see what they need to work at improving.

Learners [subject] in action on the pole [tool; artefact] crossing group activity [object]

5. TASK: LOADING AND OFF LOADING EXPLOSIVES

Objective: To get all the tyres off the pole and then back onto the pole

Rules:

1. May not throw or drop tyres, treated gently explosives (-2)
2. Tyres must be lowered to the bottom through team-work.

Loading explosives activity. The team (subject) placing tyres (tool/artefacts) onto a pole (tool/environment) and removing them (object). The rules above determine the interaction of the group as they plan, monitor, assess and problem solve (meta-cognitive strategies) as they progress to achieve their object.

6. TEAM WALL CLIMB

Objective: To get the entire team up the wall and on to the platform.

Rules:

1. May not hold around the sides of the wall.
2. may not go up the inside of the wall.

Learners in action on the wall climbing activity: object to get entire team over the wall.

Appendix B: Performance assessment sheet

ASSESSMENT OF PERFORMANCES:

KEY : 1 = Unable : 2 = Able with help : 3 = Able but needs to improve :
4 = Very competent.

Criteria	Performance indicators		score
1. Knowledge and theory			
Use of artifacts: ropes, knots, canoe paddle, safety rules, etc.	What do I know ?		
2. Techniques and skills	What can I do ?	* Unable, able with help, needs to improve, very competent.	
3. Cognitive aspects			
Planning	What do I need to do ? What do I do next ?	* Sure of what must be done, independent action. * Not sure what to do next * Can progress with help * Not able to progress	
Monitoring	How am I doing ?	* Can id own progress and problems to change if necessary, can self talk and self motivate. * Can id problem but cannot change strategy. * Can id own progress or problems with help. * Cannot id own problems at all.	
Evaluation	How have I done ?	* Can reflect on action and id strengths and weaknesses in performance and do self improvement plan. * Cannot do self improvement plan yet * Cannot id strengths and weaknesses without help. * Cannot id S + W even with help.	
4. Emotional Coping	How do I feel about ? • Disciplined activities. • Handling fear • Self-confidence • Encouraging others • Enjoyment.	*	

Appendix C: Tool to record observations of participants

OBSERVATION RECORD OF ..... DATE

ACTIVITY: .....

Criteria	Observations of the action	SYM	TOT
Pre-task			
Actual task			
Post task review			

Comments:

Appendix D: Examples of recording sheets

OBSERVATION RECORD OF Tanzi Smith DATE 12/8/2003

ACTIVITY ABSEILING (G.9)

Criteria	Observations of the action	SYM	TOT
Pre-task	P E T T P F M F Z=1	P T F M	2 2 2 1
Actual task	P T M E T D B D F M F E T P B D C D M T F E P C D B T D P M Z=3.	P E D M T F	4 3 5 4 4 4
Post task review	P T E C Z=1	P T E D	1 1 1 1

Comments:

D= 6 / F=6 / M=5 / P=7 / T=7 / E=4 /

Z=5

Appendix D(i): Recording sheet

OBSERVATION RECORD OF Slade O'Neil. DATE 2003

ACTIVITY Rock climbing (Grade 7)

Criteria	Observations of the action	SYM	TOT
Pre-task	T P F D D F Σ=4	T D P F	1 2 1 2
Actual task	P P D T F F M T P D E F B D E V T B D F P F M P T F C F D P M B P D B F E D T Σ=13	T P D B F M E	4 6 5 4 7 3 3
Post task review	T M E P D P Σ=3	T M E P D	1 1 1 2 1

Comments: Not done this activity before - very hesitant - a lot of stopping and encouragement needed.
Very pleased at end outcome!

T=6 | D=9 | P=9 | F=9 | M=4 | E=4 |
3 | 4 | 4 | 4 | 2 | 2

Σ=20

Appendix D(i): Recording sheet

OBSERVATION RECORD OF Slade O'Neil. DATE 2003

ACTIVITY Rock climbing (Grade 7)

Criteria	Observations of the action	SYM	TOT
Pre-task	T P F D D F Z=4	T D P F	1 2 1 2
Actual task	P P D T F F M T P D E F B D E V T B D F P F M P T F C F D P M B P D B F E D T Z=13	T P D B F M E	4 6 6 4 7 3 3
Post task review	T M E P D P Z=3	T M E P D	1 1 1 2 1

Comments: Not done this activity before - very hesitant - a lot of stopping and encouragement needed.

Very pleased at end outcome!

T=6 | D=9 | P=9 | F=9 | M=4 | E=4 |
3 | 4 | 4 | 4 | 2 | 2

Z=20

Appendix D(ii): Feedback information from parents

Lamayu

May 2004

Dear Parent

We are still reviewing the value of adventure type activities being included in our school curriculum. Please would you once again give us some objective feedback on the question below.

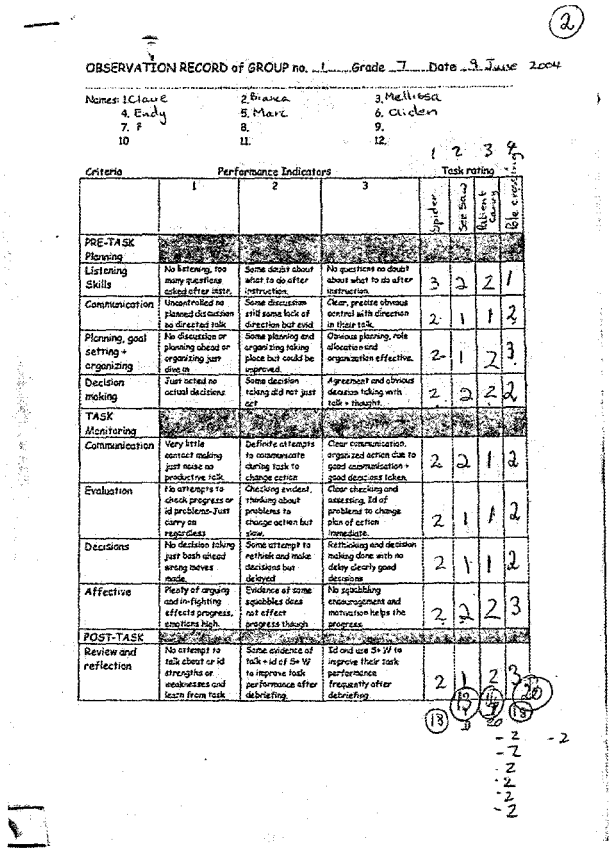
What do you objectively observe in your child's behaviour and habits that you can attribute to his/her involvement in adventure type activities within the school curriculum? Please give an example to illustrate your observation.

WE HAVE NOTED A DEVELOPMENT OF SELF-CONFIDENCE PLUS AN INCLINATION TO BE/WORK WITHOUT PROBING. WE BELIEVE THAT THE ADVENTURE TYPE ACTIVITIES HAVE DEFINATELY HAD A POSITIVE CONTRIBUTION TO THE DEVELOPMENT OBSERVED. WE THEREFORE STRONGLY SUPPORT THE CONTINUATION OF THE INCLUSION OF THE ACTIVITIES IN THE SCHOOL'S CURRICULUM.

Thank for your participation in this feedback exercise.

I.W. Galbraith
Principal

Appendix D(iii): Group performance recording sheet



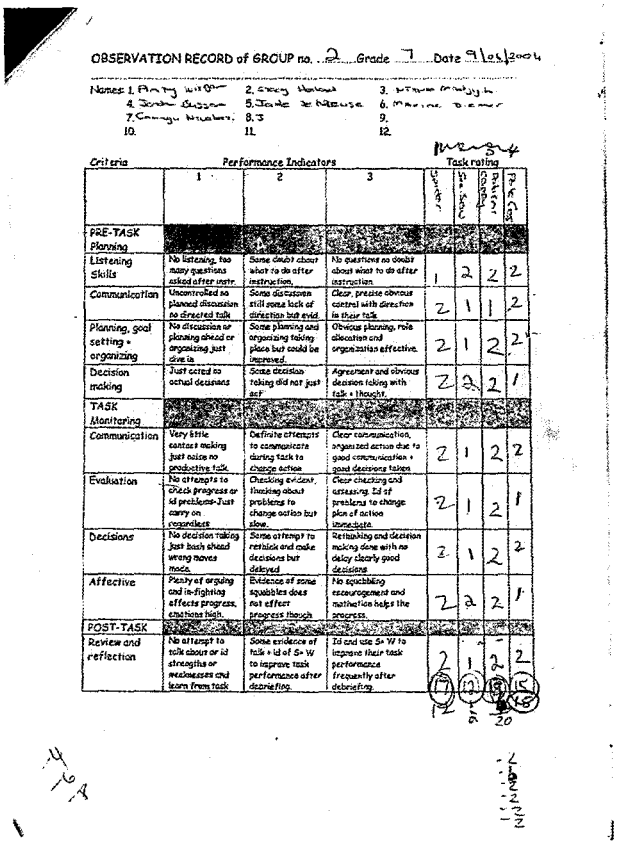
OBSERVATION RECORD of GROUP no. 1 Grade 7 Date 9 June 2004

Names: 1. Claire 2. Bianca 3. Melissa
4. Endy 5. Marc 6. Aiden
7. F 8. 9.
10 11. 12.

Criteria	Performance Indicators 1	2	3	Task rating 1 Spider	2 Sue Bird	3 Patient Casey	4 Role model
PRE-TASK Planning							
Listening Skills	No listening, too many questions asked after instr.	Some doubt about what to do after instruction.	No questions no doubt about what to do after instruction.	3	2	2	1
Communication	Uncontrolled no planned discussion no directed talk	Some discussion still some lack of direction but evid	Clear, precise obvious control with direction in their talk.	2	1	1	2
Planning, goal setting + organizing	No discussion or planning ahead or organizing just dive in	Some planning and organizing taking place but could be improved.	Obvious planning, role allocation and organization effective.	2	1	2	3
Decision making	Just acted no actual decisions	Some decision taking did not just act	Agreement and obvious decision taking with talk + thought.	2	2	2	2
TASK Monitoring							
Communication	Very little contact making just noise no productive talk.	Definite attempts to communicate during task to change action	Clear communication, organized action due to good communication + good decisions taken.	2	2	1	2
Evaluation	No attempts to check progress or id problems-Just carry on regardless	Checking evident, thinking about problems to change action but slow.	Clear checking and assessing. Id of problems to change plan of action immediate.	2	1	1	2
Decisions	No decision taking just bash ahead wrong moves made.	Some attempt to rethink and make decisions but delayed	Rethinking and decision making done with no delay clearly good decisions	2	1	1	2
Affective	Plenty of arguing and in-fighting effects progress, emotions high.	Evidence of some squabbles does not effect progress though	No squabbling encouragement and motivation helps the progress.	2	2	2	3
POST-TASK							
Review and reflection	No attempt to talk about or id strengths or weaknesses and learn from task	Some evidence of talk + id of S+ W to improve task performance after debriefing.	Id and use S+ W to improve their task performance frequently after debriefing	2	1	2	3

(13) (13) (9) (14) (20) (18) (20)

-2 -2 -2 -2 -2 -2



OBSERVATION RECORD of GROUP no. 2 Grade 7 Date 9/06/2004

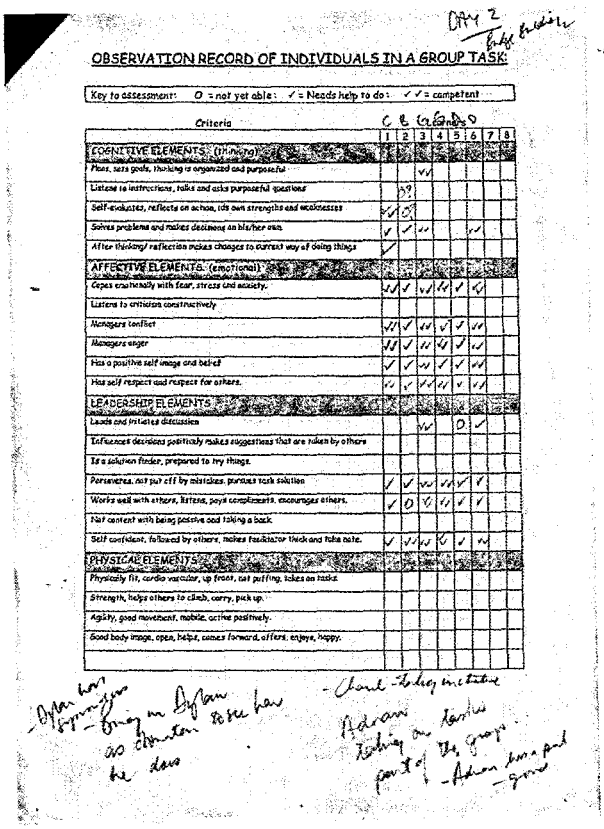
Names: 1. [illegible] 2. [illegible] 3. [illegible]
4. [illegible] 5. [illegible] 6. [illegible]
7. [illegible] 8. 3 9.
10. 11. 12.

Merry 4

Criteria	Performance Indicators 1	2	3	Task rating Spider	Sue Bird	Patient Casey	Role Model
PRE-TASK Planning							
Listening Skills	No listening, too many questions asked after instr.	Some doubt about what to do after instruction.	No questions no doubt about what to do after instruction.	1	2	2	2
Communication	Uncontrolled no planned discussion no directed talk	Some discussion still some lack of direction but evid.	Clear, precise obvious control with direction in their talk.	2	1	1	2
Planning, goal setting + organizing	No discussion or planning ahead or organizing just dive in	Some planning and organizing taking place but could be improved.	Obvious planning, role allocation and organization effective.	2	1	2	2
Decision making	Just acted no actual decisions	Some decision taking did not just act	Agreement and obvious decision taking with talk + thought.	2	2	2	1
TASK Monitoring							
Communication	Very little contact making just noise no productive talk.	Definite attempts to communicate during task to change action	Clear communication, organized action due to good communication + good decisions taken	2	1	2	2
Evaluation	No attempts to check progress or id problems-Just carry on regardless	Checking evident, thinking about problems to change action but slow.	Clear checking and assessing. Id of problems to change plan of action immediate.	2	1	2	1
Decisions	No decision taking just bash ahead wrong moves made.	Some attempt to rethink and make decisions but delayed	Rethinking and decision making done with no delay clearly good decisions	2	1	2	2
Affective	Plenty of arguing and in-fighting effects progress, emotions high.	Evidence of some squabbles does not effect progress though	No squabbling encouragement and motivation helps the progress.	2	2	2	1
POST-TASK							
Review and reflection	No attempt to talk about or id strengths or weaknesses and learn from task	Some evidence of talk + id of S+ W to improve task performance after debriefing.	Id and use S+ W to improve their task performance frequently after debriefing	2	1	2	2

(17) (12) (16) (15) 72 76 20 (18)

Appendix D(iv): Individual observation sheet

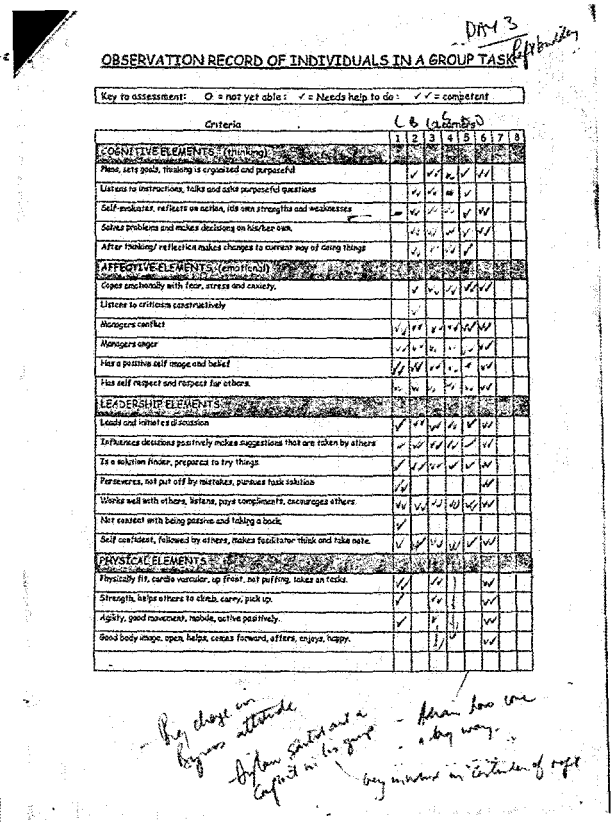


DAY 2

OBSERVATION RECORD OF INDIVIDUALS IN A GROUP TASK:

Key to assessment: O = not yet able: ✓ = Needs help to do: ✓✓ = competent

Criteria	C & (a) 1	2	3	4	5	6	7	8
COGNITIVE ELEMENTS: (thinking)								
Plans, sets goals, thinking is organized and purposeful			✓✓					
Listens to instructions, talks and asks purposeful questions		✓?						
Self-evaluates, reflects on action, its own strengths and weaknesses	✓✓	O						
Solves problems and makes decisions on his/her own	✓	✓	✓✓			✓✓		
After thinking/ reflection makes changes to current way of doing things	✓							
AFFECTIVE ELEMENTS: (emotional)								
Copes emotionally with fear, stress and anxiety.	✓✓	✓	✓✓	✓✓	✓	✓✓		
Listens to criticism constructively								
Manages conflict	✓✓	✓	✓✓	✓	✓	✓✓		
Manages anger	✓✓	✓	✓✓	✓✓	✓	✓✓		
Has a positive self image and belief	✓	✓	✓✓	✓	✓	✓✓		
Has self respect and respect for others.	✓✓	✓	✓✓	✓✓	✓	✓✓		
LEADERSHIP ELEMENTS								
Leads and initiates discussion			✓✓		O	✓		
Influences decisions positively makes suggestions that are taken by others								
Is a solution finder, prepared to try things								
Perseveres, not put off by mistakes, pursues task solution	✓	✓	✓✓	✓✓	✓	✓		
Works well with others, listens, pays compliments, encourages others.	✓	O	✓	✓✓	✓	✓		
Not content with being passive and taking a back								
Self confident, followed by others, makes facilitator think and take note.	✓	✓✓	✓✓	✓	✓	✓✓		
PHYSICAL ELEMENTS								
Physically fit, cardio vascular, up front, not puffing, takes on tasks								
Strength, helps others to climb, carry, pick up.								
Agility, good movement, mobile, active positively.								
Good body image, open, helps, comes forward, offers, enjoys, happy.								



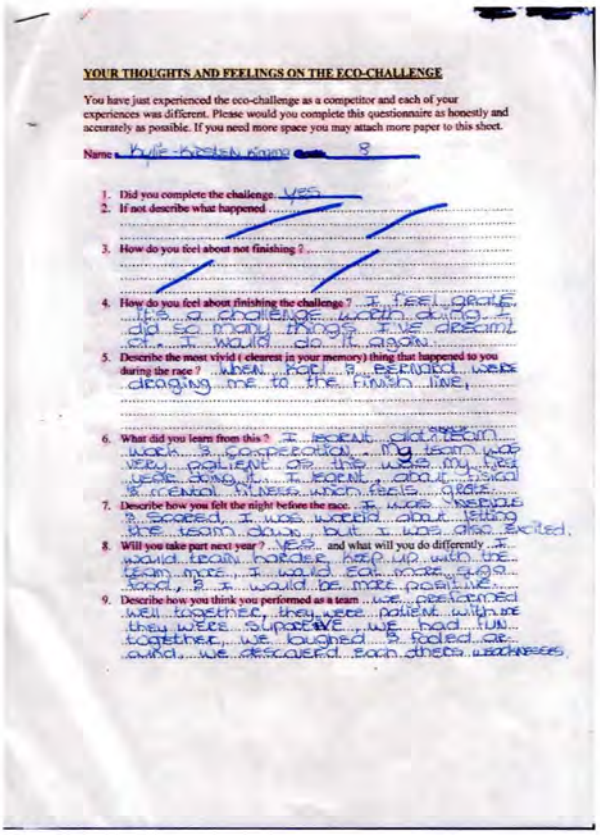
DAY 3

OBSERVATION RECORD OF INDIVIDUALS IN A GROUP TASK:

Key to assessment: O = not yet able: ✓ = Needs help to do: ✓✓ = competent

Criteria	C & (a) 1	2	3	4	5	6	7	8
COGNITIVE ELEMENTS: (thinking)								
Plans, sets goals, thinking is organized and purposeful		✓	✓✓	✓	✓	✓✓		
Listens to instructions, talks and asks purposeful questions		✓✓	✓✓	✓	✓			
Self-evaluates, reflects on action, its own strengths and weaknesses		✓✓	✓	✓	✓	✓✓		
Solves problems and makes decisions on his/her own.		✓✓	✓✓	✓	✓	✓✓		
After thinking/ reflection makes changes to current way of doing things		✓✓	✓	✓✓	✓			
AFFECTIVE ELEMENTS: (emotional)								
Copes emotionally with fear, stress and anxiety.		✓	✓✓	✓✓	✓	✓✓		
Listens to criticism constructively		✓						
Manages conflict	✓✓	✓✓	✓✓	✓✓	✓	✓✓		
Manages anger	✓✓	✓✓	✓✓	✓✓	✓	✓✓		
Has a positive self image and belief	✓✓	✓✓	✓✓	✓✓	✓	✓✓		
Has self respect and respect for others.	✓✓	✓✓	✓✓	✓✓	✓	✓✓		
LEADERSHIP ELEMENTS								
Leads and initiates discussion		✓	✓✓	✓✓	✓	✓✓		
Influences decisions positively makes suggestions that are taken by others		✓	✓✓	✓✓	✓	✓✓		
Is a solution finder, prepared to try things		✓	✓✓	✓✓	✓	✓✓		
Perseveres, not put off by mistakes, pursues task solution		✓✓				✓✓		
Works well with others, listens, pays compliments, encourages others.		✓✓	✓✓	✓✓	✓	✓✓		
Not content with being passive and taking a back		✓						
Self confident, followed by others, makes facilitator think and take note.		✓	✓✓	✓✓	✓	✓✓		
PHYSICAL ELEMENTS								
Physically fit, cardio vascular, up front, not puffing, takes on tasks.		✓✓		✓✓		✓✓		
Strength, helps others to climb, carry, pick up.		✓		✓✓		✓✓		
Agility, good movement, mobile, active positively.		✓		✓		✓✓		
Good body image, open, helps, comes forward, offers, enjoys, happy.				✓✓		✓✓		

Appendix D(v): Feedback on eco-challenge

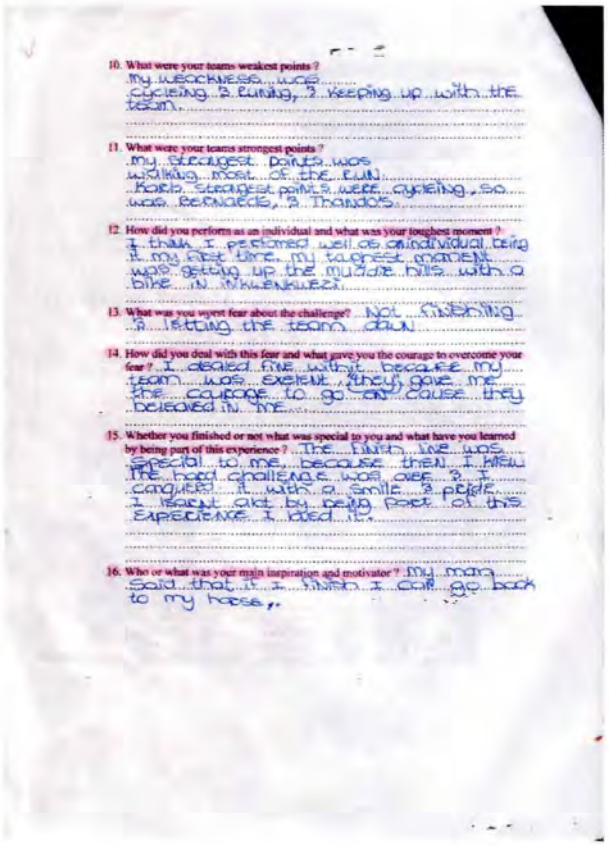


YOUR THOUGHTS AND FEELINGS ON THE ECO-CHALLENGE

You have just experienced the eco-challenge as a competitor and each of your experiences was different. Please would you complete this questionnaire as honestly and accurately as possible. If you need more space you may attach more paper to this sheet.

Name: Kylie-Kirsten Kinnear 8

1. Did you complete the challenge. Yes
2. If not describe what happened .....
3. How do you feel about not finishing ? .....
4. How do you feel about finishing the challenge ? I FEEL GREAT. IT'S A CHALLENGE WORTH DOING. I DID SO MANY THINGS I'VE DREAMT OF... I WOULD DO IT AGAIN.
5. Describe the most vivid (clearest in your memory) thing that happened to you during the race ? WHEN HOT & EXHAUSTED WERE DRAGGING ME TO THE FINISH LINE.
6. What did you learn from this ? I LEARNT ABOUT TEAM WORK & COOPERATION. MY TEAM WAS VERY PATIENT OF THE WORK MY TEAM WERE DOING. I LEARNT ABOUT MENTAL & MENTAL TOUGHNESS WHEN FEELS GREAT.
7. Describe how you felt the night before the race. I WAS NERVOUS & SCARED, I WAS WORRIED ABOUT LETTING MY TEAM DOWN BUT I WAS ALSO EXCITED.
8. Will you take part next year ? YES and what will you do differently ... I WOULD TRAIN HARDER, KEEP UP WITH THE TEAM MORE, I WOULD EAT MORE FOOD, & I WOULD BE MORE POSITIVE.
9. Describe how you think you performed as a team ... WE PERFORMED WELL TOGETHER, THEY WERE PATIENT WITH ME THEY WERE SUPPORTIVE, WE HAD FUN TOGETHER, WE LAUGHED & JOKED OF EACH WE DISCOVERED EACH OTHERS WEAKNESSES



10. What were your teams weakest points ? MY WEAKNESS WAS CYCLING & RUNNING, & KEEPING UP WITH THE TEAM.
11. What were your teams strongest points ? MY STRONGEST POINTS WAS WALKING MOST OF THE FUN. BOATS STRONGEST POINTS WERE CYCLING, SO WAS BERNARDS, & THANDO'S.
12. How did you perform as an individual and what was your toughest moment ? I THINK I PERFORMED WELL AS AN INDIVIDUAL, BEING IT MY FIRST TIME. MY TOUGHEST MOMENT WAS GETTING UP THE MUDDY HILLS WITH A BIKE IN WHICH WERE...
13. What was you worst fear about the challenge? NOT FINISHING & LETTING THE TEAM DOWN
14. How did you deal with this fear and what gave you the courage to overcome your fear ? I DEALED FINE WITH IT BECAUSE MY TEAM WAS EXTENT, THEY GAVE ME THE COURAGE TO GO ON CAUSE THEY BELIEVED IN ME.
15. Whether you finished or not what was special to you and what have you learned by being part of this experience ? THE FINISH LINE WAS SPECIAL TO ME, BECAUSE THEN I KNEW THE HARD CHALLENGE WAS OVER & I CONQUERED IT WITH A SMILE & PRIDE. I LEARNT ALOT BY BEING PART OF THIS EXPERIENCE I LIKED IT.
16. Who or what was your main inspiration and motivator ? MY MOM SAID THAT IF I FINISH I CAN GO BACK TO MY HORSE,,

Appendix E: Example of letter to parents to get feedback on the adventure programmes

24 May 2004

Dear Parent

We are still reviewing the value of adventure type activities being included in our school curriculum. Please would you once again give us some objective feedback on the question below.

What do you objectively observe in your child's behaviour and habits that you can attribute to his/her involvement in adventure type activities within the school curriculum? Please give an example to illustrate your observation.

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Thank for your participation in this feedback exercise.

I.W. GALBRAITH
PRINCIPAL

Appendix E: Example of letter to parents to get feedback on the adventure programmes

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What do you objectively observe in your child's behaviour and habits that you can attribute to his/her involvement in adventure type activities within the school curriculum? Please give an example to illustrate your observation.

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Thank for your participation in this feedback exercise.

I.W. GALBRAITH
PRINCIPAL

Appendix F: Report on the pilot study of this research

PILOT STUDY

Background

Lilyfontein school is situated 21 kms from East London on the N2 to Umtata. It serves the farming community as well as the East Coast Resorts, it has of late attracted students from East London and Gonubie. The boarding facilities accommodate students from Umtata, Butterworth, Cathcart, Stutterheim and King Williams Town.

The Primary school Gr to 7 will be 100 years old in 2005. The high school section will have its first matrics in 2004. The school's number have climbed from 180 to 300 within the space of three years.

Over the last three years Lilyfontein has established itself as an Adventure type school (although as yet do not have a fully developed definition of adventure type programmes) with its emphasis on offering adventure type sports (canoeing, abseiling, hiking, eco-challenge competitions) as an alternative to the conventional type sports (rugby, cricket, netball, etc.).

Events in 2003

During the course of 2003 the SGB and SMT decided to investigate the concept of Adventure type programmes, look at their relevance and benefit to the students and then pilot such programmes within the everyday curricular programme. These programmes would have to be developed in an ongoing manner by the co-ordinator and team of teachers involved in this pilot programme.

The decision was to;

- Continue with adventure type sports during the afternoon extra-mural programme.
- But then to include during the formal school day a session on a Wednesday and Friday where students would be involved doing these adventure activities as part of the Life Orientation programme addressing some of the prescribed outcomes. This would involve the instructor and the teacher during these periods of the day.
- Some of the senior students would be used to assist the younger students as part of the leadership development component.
- This approach would be monitored to determine its value to Lilyfontein and the future possibilities.
- Determine the benefits that these type programmes have on the students.

Activities done with students :

- Rock climbing, abseiling, rope- work, canoeing, cycling, hiking.
- Equestrian camp, 4 day hike, 5 day survival camp.
- Dam swimming, Eco-challenge,

Monitoring of the programmes

- A Video of selected activities was taken. When attempting to analyse the video it became clear that observations required very detailed write ups, this would be done at a later stage.

- So questionnaires were draw up to get more concrete evidence. The questionnaires themselves were answered in a very clinical way and did not serve to expand on the experience of the student.

- I the asked students to write narratives on their experiences with adventure activities, this proved to be rather useful as it brought out a range of issues.

- But what was very clear was that the dynamic nature of this exercise required a more interactive contact type approach so that issues could be explored.

- I then opted to also use a few focus groups.

Students :

1. Students were asked to write narrative on their experiences.

2. Time was spent speaking to students informally about their experiences.

3. A full focus group was identified from those students interviewed.

4. This focus group comprising of 12 students from grade 8 to 11 met to discuss the benefits of adventure and the sporting programmes at Lilyfontein.

Teachers :

1. Teachers were asked to give their views on how they see the programmes working in a questionnaire as well as through discussions.

2. Teachers also formed part of a combined teachers and parents focus group.

Parents :

1. Parents were asked to respond to a questionnaire.

2. Available parents were asked to be part of the teacher/ parent focus group.

Results of the contact sessions

- The benefits highlighted from the students range from enjoyment, building confidence, overcoming fears, mental toughness and sticking to a task, problem solving, the sense of achievement was a strong factor, observing changes in others (friends) attitudes was also highlighted by some, working together as a team other than a rugby or netball team, learning to trust.

- Areas that were regarded as weak. Not enough environmental learning happened, ie. Learning about plants, animals, land formations, history, etc. Do not think that higher grades can afford to loose time for academic work.

- Some classes missed out and this was unfair.

- Significant input with regards to the afternoon type sports was raised in that the numbers in our school do not allow for too much diversification and too much sport options. Adventure type sports are taking away interest from traditional sports. What as school managers can we do to accommodate this ?

- The teacher / parent focus group has made the following suggestions for 2004.

1. Extra mural programmes.

   - Conventional 15 man rugby will be restructured into 7-a-side rugby

   - Fitness component of adventure sports would be integrated into other sporting codes to enhance fitness, thinking, motivation and interest.

   - The school afternoon programmes will be re-organised to accommodate this aspect.

2. Intra mural programme.

- Only one day per week would be given to adventure aspects of the Life Orientation part of the instructional programme.
- This would be allocated so that a class would have one day per term for adventure.
- The pre-selected activity would be done.
- A very important aspect would be to develop the environmental component as part of the adventure base. Staff would be allocated to do this. Booklets and work programmes will be developed out of this but must reflect Lilyfontein's unique character and not a rehash of another school's outdoor programme.

Appendix G: minutes of two of the focus group meetings

Minutes of a meeting held on 24th October to discuss issues and ideas for sport/adventure for 2004

PRESENT: Mr I. Galbraith, K.Swan, P van Kets, and Mr van Jaarsveld
Ms P.Horne, P. Keating, J.Friedenstien, D.le Roux, M.Miller

Mr Galbraith explained that the meeting needed an outcome to address the changes for sport/adventure for 2004 and the following years.

The following problems at present were identified:

- Lack of coaches – specialized coaches
- Very little sport offered for college coaches
- Shortage of participating pupils
- Shortage of venues
- Direction of sport
- Foundation phase spot times
- Options with culture and sport
- Lack of information for parents
- Many pupils not attending sport practices
- Pupils having to wait for busses when not doing sport
- Sporting expectations
- Sporting equipment
- Sporting commitment from pupils/attitude
- Sporting uniform
- Sport cancellation
- Rainy day programme/policy
- Staff commitment
- Staff training
- Transport to league fixtures
- Staff dress
- Discipline issues/follow up
- Lack of fitness
- Sporting performance
- Adventure sport

A discussion followed and a decision was taken that rugby for u/9, u/11, u/13 would change to 7-a-side, no teams will be entered into the East London rugby league for 2004. The college would participate in 15 man rugby if there were enough boys. If not, the college would also participate in 7-a-side rugby. Netball, cricket, tennis and athletics will remain but training of fitness will be integrated with the adventure codes. Staff to be trained.

The next meeting will be held on Friday 31st October.

Appendix H: First page of the ARA constitution

ADVENTURE RECREATION ASSOCIATION

CONSTITUTION

1. **NAME**
The name shall be the Adventure Recreation Association (S.A.).
-ARA-
The slogans of the Association will be
"The great outdoors for experiences and transfer of learning"
"The outdoors makes a difference to people"

2. **OFFICE**
Outdoor Adventure Recreation Association -ARA
P O Box 30329
Wonderboompoort
0033

3. **DEFINITION**
The association is a voluntary independent non-political non-governmental body, which provides a service to the Outdoor Recreation & Education industry without profit and the members of the Council, receive no salary.

4 **OBJECTS**
To advance the education of the public in and through outdoor recreation and outdoor learning programmes

5. **MISSION**
-To promote a healthy life-style and active concern for the environment, through participation in outdoor recreation and adventure activities..
-To enhance the standard of outdoor adventure recreation leadership training.
-To accredit outdoor adventure recreation centre's in all regions / or individual experts to offer ARA's national adventure recreation leadership training programmes.
-To admit outdoor centres to the accreditation programme with a specific status eg to present specialist activities and training, or specific outdoor recreation activities for visitors,

6. **MEMBERSHIP**
The membership of ARA shall comprise managers, professionals stakeholders and facilitators responsible for the education of the public in and through outdoor recreation programmes.

Corporate Members: Accredited Outdoor Activity Centres and other organizations, companies, Tertiary institutions Schools each represented by two persons, one of whom shall be a manager and the

Appendix I: Examples of learners engaged in adventure type activities which are included as part of the intra and extra-mural programme at Lilyfontein School

Figure 1: Learners engaged in a cycling activity

Figure 2: Lilyfontein learners engaged in abseiling activities

Figure 3: Learners engaged in a rock climbing activity

Figure 4: Learners engaged in canoeing practice as part of the extra-curricular programme

Figure 5: Paddling the Fish River

Figure 6: Fish River rapids

Figure 7: Getting ready for the high-wire.

Figure 8: High wire experience

Figure 9: Overcoming fears

Figure 10: Another initiative task

Figure 11: Wall climbing

Figure 12: Abseiling down Madonna and Child Waterfall

Figure 13: Initiative and team work task

Figure 14: Some team work at the wall

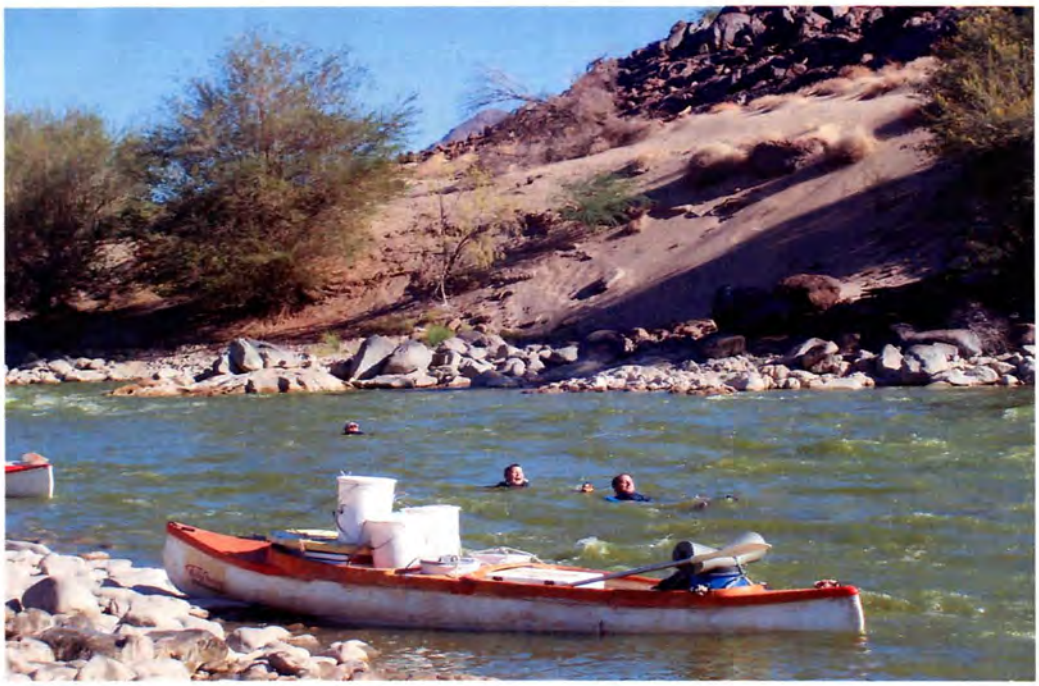

Figure 15: Orange River 2005 adventure experience

LILYFONTEIN
SCHOOL
Your adventure starts here!