

**INVESTIGATING QUALITY IN EDUCATION
THROUGH THE USE OF AN ACTIVE LEARNING FRAMEWORK:**

**THE CASE OF AN INTERVENTION IN THE NAMIBIAN
ENVIRONMENTAL STUDIES CURRICULUM**



**Thesis submitted in partial fulfilment of
the requirements of the degree of**

**MASTER OF EDUCATION:
ENVIRONMENTAL EDUCATION**

RHODES UNIVERSITY

**By:
Nicola Jacobs
(609J6180)**

**Supervisor:
Dr Ingrid Schudel**

February 2015

ABSTRACT

The study was conducted to explore the relationship between active learning processes emerging from the use of O'Donoghue's (2001) active learning framework and a series of education quality indicators proposed by Nikel and Lowe (2010). To achieve this aim a professional educational intervention was conducted encouraging the use of this active learning framework in the Namibian *Environmental Studies Curriculum*, in order to strengthen educational quality within the *Environmental Studies Curriculum*.

The research was conducted in the Windhoek region at the school where I am currently teaching. Four teachers took part in this study, including myself in the role of a participant-observer. The active learning framework was used to guide us in the planning and presentations of environmental learning lessons.

The study was conducted within the interpretive paradigm and was qualitative in nature as well as focusing on a quantitative aspect to analyse some of the data (learners' written work). Qualitative data were generated through individual interviews, focus-group discussions, lesson observations and document analysis.

The key findings of the study were that: a) prior to the intervention with the active learning framework the teachers who took part in the study did not ask learners to explore environmental issues in the environment or to respond to particular environmental issues; b) active learning processes have the potential to facilitate the exploration of environmental issues in the environment, and responses to particular environmental issues. Active learning also have the potential to strengthen all aspects of education quality indicated in Nikel and Lowe's (2010) quality model, namely effectiveness, efficiency, equity, relevance, responsiveness, reflexivity and sustainability; c) the active learning framework encouraged teachers to use a variety of situated learning approaches, such as the collaborative method, the cooperative method, the problem-solving method and the enquiry method, in order to strengthen the educational quality in Environmental Studies classrooms; and d) teachers find the active learning framework useful as a tool for planning and presenting environmental learning lessons.

The findings of the study have the potential to inform curriculum developers, materials developers and educators with an interest in improving education quality through

environmental learning processes within the *Environmental Studies Curriculum* in Namibia. Furthermore, Nickel and Lowe's education quality indicators provided an informative and comprehensive understanding of education quality and provided a useful tool in evaluating and reflecting on education quality as well as my own work as a teacher.

DEDICATION

This study is dedicated to my husband Ivan and the rest of my family, my mom, Ronny, Anneley, Denise, Sonja, in-laws and friends for enduring my frequent periods of absence away from home and for all those who partly contributed to the cost of the study including travelling and accommodation costs.

ACKNOWLEDGEMENTS

This study would not have been possible without the support of numerous people that stood by my side during the MEd Environmental Education Course. Special thanks go to the following people:

To Professor Heila Lotz-Sisitka, Professor Rob O'Donoghue, Dr Ingrid Schudel and Dr Lausanne Olvitt for their excellent professional skills, knowledge and support during the MEd Environmental Education coursework sessions.

In particular I want to acknowledge my supervisor Dr Ingrid Schudel for her steadfast guidance during the writing up of the thesis. Her confidence, motivation and thoroughness reveal that she is a true quality educator.

Furthermore, I want to acknowledge my colleagues – the three teachers who were extremely supportive and willing to actively participate in this study from the beginning till the end of the project.

Last but not least, my heartfelt acknowledgement goes to my family for their ceaseless motivation, encouragement and endurance during the period of the MEd Environmental Education Course.

TABLE OF CONTENTS

ABSTRACT.....	ii
DEDICATION.....	iv
ACKNOWLEDGEMENTS.....	v
TABLE OF CONTENTS.....	vi
LISTS OF FIGURES, APPENDICES AND PLATES.....	xii
LIST OF FIGURES.....	xii
LIST OF TABLES.....	xii
LIST OF APPENDICES.....	xii
LIST OF PLATES.....	xiii
CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY.....	1
1.1 INTRODUCTION.....	1
1.2 ENVIRONMENTAL EDUCATION POLICY IN NAMIBIA.....	1
1.3 NAMIBIA’S LEARNER-CENTRED APPROACH TO TEACHING AND LEARNING.....	3
1.4 ENVIRONMENTAL AND LEARNER-CENTRED LEARNING IN THE NAMIBIAN ENVIRONMENTAL STUDIES CURRICULUM.....	4
1.5 EDUCATION QUALITY.....	5
1.6 NIKEL AND LOWE’S EXPLORATION OF QUALITY IN EDUCATION.....	7
1.7 MY ROLE AND INTEREST IN THE STUDY.....	8
1.8 RESEARCH QUESTION AND GOALS OF THE STUDY.....	8
1.9 A BRIEF INTRODUCTION TO THE STUDY SITE.....	9

1.10 OVERVIEW OF THE THESIS.....	10
CHAPTER 2: ENVIRONEMTAL LEARNING, ACTIVE LEARNING AND QUALITY EDUCATION.....	12
2.1 INTRODUCTION.....	12
2.2 ADDRESSING ENVIRONMENTAL LEARNING IN EDUCATION.....	12
2.3 ACTIVE LEARNING.....	13
2.4 AN ACTIVE LEARNING FRAMEWORK.....	14
2.4.1 Focus area.....	17
2.4.2 Information seeking.....	17
2.4.3 Enquiry encounters.....	17
2.4.4 Action taking.....	18
2.4.5 Reporting ideas.....	19
2.5 SITUATED LEARNING THEORY AND ACTIVE LEARNING PROCESSES.....	20
2.5.1 Cooperation and collaboration.....	21
2.5.2 Investigating phenomena and interpreting data.....	22
2.5.3 Critical thinking and problem solving.....	23
2.6 ENVIRONMENTAL LEARNING IN THE NAMIBIAN CURRICULUM CONTEXT.....	24
2.6.1 The Namibian Environmental Learning Curriculum Guidelines for educators.....	24
2.6.2 The Namibian Environmental Studies Curriculum.....	25
2.7 THE ‘FABRIC’ MODEL OF EDUCATIONAL QUALITY.....	27
2.7.1 Effectiveness.....	29
2.7.2 Efficiency.....	31

2.7.3 Equity.....	32
2.7.4 Responsiveness.....	32
2.7.5 Relevance.....	33
2.7.6 Sustainability.....	35
2.7.7 Reflexivity.....	36
2.8 CONCLUSION.....	37
CHAPTER 3: RESEARCH DESIGN.....	39
3.1 INTRODUCTION.....	39
3.2 RESEARCH METHODOLOGY.....	39
3.2.1 Mixed methods approaches to social inquiry.....	39
3.2.2 Case study.....	41
3.3 DATA GENERATION.....	41
3.3.1 Semi-structured interviews.....	42
3.3.2 Focus-group discussions.....	43
3.3.3 Document analysis: Teachers' lesson plans, associated activities and the Environmental Studies Curriculum.....	43
3.3.4 Classroom observations.....	44
3.3.5 Standardised testing: Learners' work.....	44
3.4 DATA ORGANISATION.....	45
3.5 DATA ANALYSIS.....	47
3.5.1 Phase 1 – Analytical memo 1: Baseline analysis.....	48
3.5.2 Phase 2 – Part 1: Post-intervention (Mini-case stories).....	49
3.5.3 Phase 2 – Part 2: Analytical memo 2: Teachers' reflections on the use of the active	

learning framework.....	50
3.5.4 Phase 3: Analysis of emergent active learning processes in relation to education quality.....	51
3.6 DATA GENERATION: CHALLENGES ENCOUNTERED.....	51
3.7 RESEARCH DESIGN SUMMARY.....	53
3.8 RESEARCH VALIDITY, TRUSTWORTHINESS AND ETHICS.....	53
3.8.1 Validity and trustworthiness.....	53
3.8.2 Research ethics.....	55
3.9 CONCLUSION.....	56
CHAPTER 4: TEACHERS' EXPERIENCE WITH THE ENVIRONMENTAL STUDIES CURRICULUM AND THEIR ENGAGEMENT WITH THE ACTIVE LEARNING FRAMEWORK.....	57
4.1 INTRODUCTION.....	57
4.2 TEACHERS' EXPERIENCE WITH THE ENVIRONMENTAL STUDIES CURRICULUM.....	57
4.2.1 Value of the Environmental Studies Curriculum.....	58
4.2.2 Training received.....	58
4.2.3 Methods and strategies.....	59
4.2.4 Knowledge.....	59
4.2.5 Difficulties.....	60
4.3 TEACHERS' ENGAGEMENT WITH THE ACTIVE LEARNING FRAMEWORK.....	60
4.3.1 Implementation of the active learning framework: Grade 1 (Teacher 4: Active Participant).....	61
4.3.2 Implementation of the active learning framework: Grade 2	

(Teacher 1).....	76
4.3.3 Implementation of the active learning framework: Grade 3	
(Teacher 2).....	88
4.3.4 Implementation of the active learning framework: Grade 4	
(Teacher 3).....	103
4.4 TEACHERS' REFLECTIONS ON THE LESSONS PLANNED AND PRESENTED	
ACCORDING TO THE ACTIVE LEARNING FRAMEWORK.....	120
4.4.1 General views on the implementation of the active learning	
framework.....	120
4.4.2 Challenges encountered during lesson planning and presentation.....	121
4.3 CONCLUSION.....	122
CHAPTER 5: THE EDUCATION QUALITY INDICATORS AND THE USE OF THE	
ACTIVE LEARNING FRAMEWORK.....	123
5.1 INTRODUCTION.....	123
5.2 THE RELATIONSHIP BETWEEN THE EMERGENT ACTIVE LEARNING	
PROCESSES AND THE EDUCATION QUALITY INDICATORS.....	123
5.2.1 Effectiveness.....	123
5.2.2 Efficiency.....	128
5.2.3 Equity.....	130
5.2.4 Responsiveness.....	132
5.2.5 Relevance.....	133
5.2.6 Sustainability.....	135
5.2.7 Reflexivity.....	136
5.3 CONCLUSION.....	137

CHAPTER 6: SUMMARY OF FINDINGS, LIMITATIONS, REFLECTIONS AND RECOMMENDATIONS OF THE STUDY.....	140
6.1 SUMMARY OF FINDINGS.....	140
6.2 LIMITATIONS OF THE STUDY AND REFLECTIONS ON THE RESEARCH PROCESS.....	145
6.3 RECOMMENDATIONS EMERGING FROM THE STUDY.....	146
6.4 FURTHER RESEARCH.....	149
6.5 CONCLUDING COMMENTS.....	149
REFERENCES.....	150

LIST OF FIGURES, TABLES APPENDICES AND PLATES

LIST OF FIGURES

Figure 2.1: O'Donoghue's active learning framework (2001).....	16
Figure 2.2: Nikel and Lowe's educational quality model (2010).....	29

LIST OF TABLES

Table 3.1: Inventory of data sources.....	45
Table 3.2: Data index, showing codes used to differentiate data sources.....	46
Table 3.3: Category list – Phase 1 analysis.....	48
Table 3.4: Category list – Phase 2 (Part 1) analysis.....	49
Table 3.5: Category list – Phase 2 (Part 2) analysis.....	51
Table 3.6: Summary of research process.....	53

LIST OF APPENDICES

Appendix A: Example of a coded transcribed interview.....	156
Appendix B: Coded transcript of Focus-group Discussion 1.....	163
Appendix C: Coded transcript of Focus-group Discussion 2.....	175
Appendix D: Coded transcript of Individual Interview 2 – Teacher 3.....	193
Appendix E: Assessment results Grades 1-3.....	196
Appendix F: Analytical memo 1.....	198
Appendix G: Example of a mini-case story.....	208
Appendix H: Analytical memo 2.....	235
Appendix I: Analytical memo 3.....	240
Appendix J: Letter of permission to the principal.....	257
Appendix K: Consent letter to teachers.....	258
Appendix L: Environmental Studies Curriculum.....	259

LIST OF PLATES

GRADE 1: PLATES 1-5.....	71
PLATE1.....	71
Photograph 1: Poster of food that was used in the lesson of healthy and unhealthy food types.	
PLATE 2.....	72
Photograph 2: Poster of food that was used in the lesson to teach learners how bread is made.	
Photograph 3: Picture of learners' work. The learners had to colour only the food that they like to eat.	
Photograph 4: Questionnaire done by learners.	
PLATE 3.....	73
Photograph 5: Graph of what learners eat daily.	
Photograph 6: Poster of healthy food types.	
Photograph 7: Rhyme of 'Healthy food'.	
Photograph 8: Rhyme of 'My teeth'.	
Photograph 9: Worksheet done by learners on healthy and unhealthy food types.	
Photograph 10: The Agriculture teacher demonstrating how deep the holes should be to plant the carrot seeds.	
Photograph 11: The Agriculture teacher demonstrating how far apart the holes should be to plant the carrot seeds.	
PLATE4.....	74
Photograph 12: One learner who was eager enough to come plant the carrot seeds.	
Photograph 13: The Agriculture teacher assisting learners with the planting of the carrot seeds.	
PLATE5.....	75
Photograph 14: Worksheet done by learners on healthy and unhealthy food types.	
Photograph 15: Worksheet done by learners on how to plant seeds.	
GRADE 2: PLATES 6-9.....	85
PLATE6.....	85
Photograph 16: The story that was read to the Grade 2 learners: 'Dorothy Raindrop'.	
PLATE 7.....	86
Photograph 17: Poster of water-saving ways.	
Photograph 18: Learners' work of how water is saved at home.	
Photograph 19: Learners colouring the pictures on the posters of how to save water.	
Photograph 20: Water-saving poster that was put up in the boys' toilet.	
PLATE8.....	87
Photograph 21: Water-saving poster that was put up in the girls' toilet.	
Photograph 22: Worksheet done by learners on water saving ways.	
GRADE 3: PLATES 9-12.....	99
PLATE9.....	99

Photograph 23: Pictures of a traffic signs.

Photograph 24: Picture of a zebra crossing.

Photograph 25: Picture of a learner being a stop sign.

Photograph 26: Picture of a learner being a pedestrian crossing sign.

PLATE 10.....100

Photograph 27: Questions given to learners for the enquiry they had to do for homework.

PLATE11.....101

Photograph 28: Letter that was written and sent to the traffic department.

PLATE12.....102

Photograph 29: Worksheet done by learners on traffic safety.

GRADE 4: PLATES 13-15.....117

PLATE 13.....117

Photograph 30: Learners' work. Information copied from chalk board.

Photograph 31: Learners' work, explaining the difference between different wastes.

Photograph 32: Learners' work. Information copied from chalk board about hazardous waste.

PLATE 14.....118

Photograph 33: Hand-out that was given to learners.

PLATE15.....119

Photograph 34: Worksheet done by learners on the effects of waste.

Photograph 35: Teacher and learner digging a hole for the compost heap.

Photograph 36: Learner's description and drawing of a compost heap.

CHAPTER 1

Introduction and background to the study

1.1 INTRODUCTION

The purpose of this study was to investigate the relationship between emergent active learning processes and educational quality in the Namibian *Environmental Studies Curriculum* (Grades 1-4). The study investigates a professional educational intervention where I introduced the active learning framework (O'Donoghue, 2001) to the Lower Primary teachers at our school. Lower Primary was changed to Junior Primary with the new Curriculum reform that will be implemented in 2015. For the purpose of this study the focus will still be on Lower Primary and not on Junior Primary as stated above. The active learning framework was used to plan and teach *Environmental Studies Curriculum* topics with an environmental focus. This was done to teach learners how to address and respond to environmental problems/issues/risks/concerns through active learning processes. However, the main focus of the research was to reflect on emergent active learning processes in relation to education quality concerns in Namibia. A series of education quality indicators (Nikel & Lowe, 2010) developed within the field of environmental education were used to explore the meaning of education quality in the Namibian context. This chapter provides contextual background and an overview of the research question and goals, my role and interest in the study and a general overview of the study as a whole.

1.2 ENVIRONMENTAL EDUCATION POLICY IN NAMIBIA

In the government document, *Towards Education for All – A Development Brief for Education, Culture and Training* (1993) it is stipulated that environmental awareness is:

To develop a holistic understanding of the dynamic interdependence of all living things and their environment; to develop a sense of responsibility toward restoring and maintaining ecological balances through the sustainable management of natural resources, and to promote involvement in practical activities to preserve and sustain the natural environment (Namibia. Ministry of Education and Culture [MEC], 1993, p. 58).

My interest is particularly in the last part of this quote, which is to promote involvement in practical activities to preserve and sustain the natural environment. Prior to this study I

suspected that we as teachers in my school had not focused on the implementation of practical activities within the field of environmental learning, but rather on teaching subject content to learners within the classroom environment with relevant learning support materials to bring understanding about the subject content. I also suspected that in general we did not ask learners to explore environmental issues in the environment or to take action to respond to particular environmental issues. With this taken into consideration I introduced three colleagues to an active learning framework (O'Donoghue, 2001, Section 2.4) "in order to encourage learners to become actively involved in addressing and responding to environmental issues" (Schudel, Dambuza, Lotz-Sisitka, Magonare, O' Donoghue & Solomon, 2000, p. 6).

Taking action for the environment is highlighted in Namibia's Environmental Education policy document. This document states that:

We the people of Namibia, will actively encourage, support and implement environmental education as a means of achieving and fulfilling Article 95 of the Constitution. Environmental education should aim to empower Namibians, from all sectors, to critically evaluate environmental information options, to make informed decisions, and to take actions that will contribute to the goal of environmental and economic sustainability (NEEN, 1999, p. 4).

To address this policy in education, two initiatives were put into practice, namely the *Namibia Environmental Education Network* initiative and the *Supporting Environmental Education in Namibia* initiative.

The *Namibian Environmental Education Network* was constituted and registered in June 1995 as a not-for-profit organisation (NEEN, 1995). This network was created by various Namibian environmental education practitioners and educators in response to a desire to work collaboratively towards several nationally recognised objectives. These objectives are rooted in Article 95 of the Namibian Constitution as mentioned earlier (ibid, 1995). The creation of this organisation led to the development of the *Supporting Environmental Education in Namibia* project.

The *Supporting Environmental Education in Namibia* project was started in October 2001. According to project documentation educationalists had argued for a long time already about how we learn and how school learning can be integrated in the environment (SEEN, 2004). It also highlights that experiential and cooperative learning is important for learning in real-life situations to bring understanding and change (ibid, 2004). SEEN furthermore stipulates that to relate school learning to the environment, constructive learning is needed (2001), which

requires an exploration of active and participatory approaches that will allow learners to encounter, discuss, reflect on and contextualise environmental issues (ibid, 2004). This statement was my link to the active learning framework, as it uses the exact words as O'Donoghue (2001) who speaks about active and participatory processes that will enable learners to encounter, discuss, reflect on and contextualise environmental issues.

O'Donoghue and Russo note that “the active learning framework as a tool for planning environmental learning was rapidly picked up in professional development activities” (2004, p. 344). This framework for active learning has the potential to encourage learner-centred teaching. This is evident in O'Donoghue and Russo's work where they state that “in 1999-2001, as environment was identified as a concern within all learning areas in South Africa, an open process framework was abstracted as a tool for planning environmental learning and using materials in a more learner-centred school curriculum” (2004, p. 344). For this study the active learning framework was also used in a learner-centred school curriculum, which will be elaborated on in more detail in the following section.

1.3 NAMIBIA'S LEARNER-CENTRED APPROACH TO TEACHING AND LEARNING

In the Namibian curriculum it is stipulated that teaching and learning ought to take place in a learner-centred manner. A learner-centred approach is seen as an approach that includes several methods and activities that focus primarily on the individual as part of the teaching and learning process (Namibia. Ministry of Basic Education and Culture [MBEC], 2005a).

A process interest in learning is evident in the Namibian curriculum where the teachers are not only provided with what they should teach but are also provided with how teaching and learning ought to take place (Namibia. MBEC, 2005a). As stipulated in *Towards Education for All* our challenge in the teaching and learning process “is to develop instructional strategies that make it possible for learners from varying backgrounds and with differing abilities all to progress” (Namibia. MEC, 1993, p. 39). This document also indicates that “it is precisely for this reason that a learner-centred approach is so central to the new education system we are creating” (ibid, 1993).

Namibia has adopted a learner-centred approach to teaching and learning (which was first introduced in 2005) with the new curriculum reform (Namibia. MBEC, 2005a). This new approach to teaching and learning was adopted to replace the previous approach of teaching and learning which was based on a teacher-centred approach. This was done to ensure that all learners are included and involved in lesson presentations and to broaden the approach of the past where learners were merely passive receivers of content knowledge. In a teacher-centred approach, the learners tended not to participate actively in the teaching and learning process in terms of knowledge, skills and attitudes (ibid, 2005a).

The main aim of a learner-centred approach is to develop learning with understanding, and the skills and attitudes to contribute to the development of society. Within a learner-centred approach “learning in school must involve, build on, extend and challenge the learner’s prior knowledge and experience” (Namibia. MBEC, 2005a, p. 94).

The next section elaborates on the *Environmental Studies Curriculum* which was the curriculum context of this study. It also explains how learner-centredness can be explored in the *Environmental Studies Curriculum*.

1.4 ENVIRONMENTAL AND LEARNER-CENTRED LEARNING IN THE NAMIBIAN ENVIRONMENTAL STUDIES CURRICULUM

The Namibian *Environmental Studies Curriculum* (Grades 1-4) stipulates that content knowledge ought to be contextualised in order to bring understanding to new subject content knowledge (Namibia. MBEC, 2005a). Contextualising content knowledge can also be found in Hogan’s work (2008). In her study she found that integrating local environmental cultural knowledge successfully contributed to curriculum relevance both epistemologically (local knowledge, and to different ways of knowing) and pedagogically (active, engaged learning processes situated in local context cultures) (ibid, 2008).

The Namibian *Environmental Studies Curriculum* (Grades 1-4) emphasises understanding the local, social and natural environment whereby new concepts should be applied in a known context (Namibia. MBEC, 2005a). A number of authors argue that the use of the learners’ own context helps them to understand environmental topics, which enable them to apply this knowledge in their everyday lives in order to improve their living standards and situations

(Dadder, Baltodano & Torries, 2003; Namibia. MBEC, 2005a; Hogan, 2008; Leach & Moon, 2008).

It is stipulated in the *Environmental Studies Curriculum* that a learner-centred approach helps learners to “discover or explore information for themselves” (Namibia. MBEC, 2005a, p. 94). The *Environmental Studies Curriculum* also stipulates that according to a learner-centred approach “learners learn best when they are actively involved in the learning process through a high degree of participation” (ibid, 2005a, p. 94). The *Environmental Studies Curriculum* furthermore stipulates that a learner-centred approach allows that “learners can gradually be given increasing responsibility to participate in planning their own work, under the teacher’s guidance” (ibid, 2005a, p. 94).

Learner-centred education makes room for collaboration, cooperation, critical thinking and problem solving while applying knowledge in everyday life. However, learner-centred education does not give the teachers guidance explicitly on how to teach learners to take action for the environment through active, “real life” learning processes. This is what this research project aims to explore with the use of the active learning framework which encourages learner-centredness as highlighted by O’Donoghue and Russo (2004). It furthermore aims to explore whether active learning processes might be a means to improve the educational quality of the *Environmental Studies Curriculum*.

The research interest is in education quality, the next section elaborates on education quality in general and educational quality as stipulated in the Namibian curriculum context.

1.5 EDUCATION QUALITY

Lotz-Sisitka states that “most of us would agree that improved educational quality is desirable, there is little discussion in the environmental education community as to what this actually means, and how environmental education may be seen to be improving educational quality” (2008, p. 5). According to Nikel and Lowe environmental education may be seen to be improving educational quality as they regard quality as a matter of process rather than product. They state that “quality is a matter of process rather than product, and that this complex process demands a strategic approach” (2010, p. 589). As highlighted by Wals and Van der Leij “the world of environmental education focuses too much on formulating the content and outcome of

environmental education, and too little on the quality of the learning process” (1997, p. 18). On the other hand, Shumba, Kasemba, Mukundu and Muzenda accentuate that “education that is relevant and of good quality and provided formally through the school can lead to learning values and practices that lead to environmental quality” (2008, p. 94).

Towards Education for All states that “we have all encountered people who have done well in their examinations but who cannot effectively use the formulas and dates they have memorised” (Namibia. MEC, 1993, p. 38) and that “we are used to taking examination results as the principal and often the only indicator of the quality of our education system” (ibid, 1993, p.38). In fact, examination results are only a partial measure of what we need to provide in education (ibid, 1993, p. 38). For example, learners can be given the opportunity to do projects where they can apply the theory that they have learnt in order to bring the content knowledge measured with examination writing into practice.

Therefore we need to use an approach to teaching and learning that would not only teach learners to memorise content knowledge but to put content knowledge into practice through the use of practical activities in the teaching and learning processes. These practical activities would teach them the knowledge, skills and attitudes that would provide them with the ability to apply the content knowledge learnt in their everyday lives. For instance, when teaching the learners the topic of deforestation, the learners should not only be given the information to memorise, but they should be taken out into the environment to show them the root causes and effects of deforestation to enable them to understand why it is important to plant trees as a response in order to sustain this natural resource. In this process the learners should be given the opportunity to do research on the topic themselves and to work in cooperation to socially construct the meaning of deforestation and bring understanding to the topic. Furthermore, in order to instil content knowledge of a subject, content knowledge needs to be practised in order to internalise the subject content for life.

Nikel and Lowe note that “a pedagogy-led approach emphasises individuals, relevance and efficiency” (2010, p. 592; see also Rosenberg, 2008; Lupele & Lotz-Sisitka, 2012). In *Towards Education for All* it is stipulated that “the most important challenge in improving the quality of our education system is to ensure that our teachers are well prepared for the major responsibility they carry” (Namibia. MEC, 1993, p. 37). Teachers ought to prepare themselves well by using good teaching methods and activities appropriate for the topic they want to teach the learners in order for them to understand and apply the content knowledge. As highlighted by

Leach and Moon (2008), if poor teaching methods are used, the nature of the learning will also be poor.

1.6 NIKEL AND LOWE’S EXPLORATION OF QUALITY IN EDUCATION

Nikel and Lowe (2010) are concerned with education quality and therefore accentuate that quality is not a product but a process. They reviewed several education quality frameworks in order to create their own education quality model that would address what they argued were weak representations of education quality. From their point of view:

Improving quality has become a key phrase in policy and academic discourses on education in low-income countries, reflecting concerns that the success in increasing enrolment and widening access to schooling is being undermined by low-quality teaching and learning, and subsequent low levels of skills and knowledge among school leavers” (2010, p. 589).

Progress has been reported towards universal enrolment and improved gender parity (Michaelowa 2001; Filmer, Hasan, & Pritchett 2006). However, the success of this has been criticised in relation to limited impact on increasing completion rates that ensure students’ proficiency in numeracy, literacy and essential life skills after completing school, especially among the most disadvantaged. This indicates a need to consider the impact of education quality in schools (Nikel & Lowe, 2010; Rosenberg, 2008).

Nikel and Lowe argue that their “interest in developing a model of quality originated in a concern over educational development in low-income countries and it is from an analysis of the literature in this field that [their] model has emerged” (2010, p. 590). Hence, they further elaborate that their model may be applicable in other areas as well but that it was not their concern to develop it (ibid, 2010). According to Buarque, Spolar and Zhang “it is important to note that we use the phrase ‘low-income country’ with an awareness of the situation in most countries being that of a social separation in which most of the population has a low income while a minority is not subject to limited choice in services” (2006, p. 220).

A further exploration of education quality was done on the work of Shumba, Kasemba, Mukundu and Muzenda (2008) with the focus on relevance of education quality and the work of Lupele and Lotz-Sisitka (2012) with the focus on socio-cultural aspects of education quality.

These researchers' work was used in addition to Nickel and Lowe's (2010) seven education quality indicators as will be discussed in Section 2.7.

1.7 MY ROLE AND INTEREST IN THE STUDY

My role in this research project was to interview selected teachers from my school and to conduct a professional intervention workshop in which I introduced the active learning framework to them. We then planned and implemented lessons using the framework (in which I was also an active participant, planning and presenting my own lessons).

The teachers who participated in this study developed learner-centred active learning processes focusing on different curriculum content. The three broad themes of the *Environmental Studies Curriculum* (Grades 1-4) which were used to plan and implement lessons using the framework were the Social Environment; Health, Safety and Nutrition; and the Natural Environment (Namibia. MBEC, 2005a). These broad themes start in Grade 1 and continue up to Grade 4, which is the end of the Lower Primary Phase (Junior Primary Phase as from 2015). The topic that was presented under the broad theme the 'Social Environment' was 'Traffic Safety'. This topic was presented to the Grade 3 learners. The topic that was presented under the broad theme 'Health, Safety and Nutrition' was 'Nutrition'. This topic was presented to the Grade 1 learners. The topics that were presented under the broad theme the 'Natural Environment' were 'Water' and 'Waste Management'. The topic 'Water' was presented to the Grade 2 learners, whereas the topic 'Waste Management' was presented to the Grade 4 learners.

I observed all the teachers' lesson presentations according to the active learning framework and one of the teachers, in turn, observed me after an introduction and orientation to my research interest.

1.8 RESEARCH QUESTION AND GOALS OF THE STUDY

The research question for this study is:

What is the relationship between emergent active learning processes and quality education in the implementation of Environmental Studies lessons in a Khomasdal school in Windhoek?

The goals of the study are as follows:

- To investigate teachers' experiences with different teaching methods and strategies in teaching environmental topics in Environmental Studies (prior to the intervention).
- To describe and explore active learning processes emerging from a teacher professional development intervention introducing teachers to an active learning framework.
- To investigate how emergent active learning processes relate to education quality.

The aim of this is to determine if the active learning framework has the potential to address education quality concerns in Namibian Lower Primary Environmental Studies classrooms.

1.9 A BRIEF INTRODUCTION TO THE STUDY SITE

The study involved four teachers (including myself) who are all teaching in the Lower Primary Phase (Grades 1-4) at the school where I am teaching. One teacher from each of Grades 1-4 was selected to take part in this study. Three of the four teachers are qualified in the Lower Primary Phase (Grades 1-4) and one of the teachers is qualified in the Upper Primary Phase (Grades 5-7), but at the time of the study she was teaching in the Lower Primary Phase.

The school which was the focus of the study is situated in a small neighbourhood in the Khomasdal Windhoek region. The school offers Grades 1-7 and has approximately 600 learners. As it is a small school it only consists of two classes per grade. Each class consists of approximately 40 learners. The learners attending this school come from different cultures and backgrounds with lower, middle and upper class living standards. The two main languages that are taught in the school are English and Afrikaans. The medium of instruction for one stream of Grades 1-3 is English, while Afrikaans is the second language. The medium of instruction for the other stream of Grades 1-3 is Afrikaans, while English is the second language. I selected the English stream on which to focus this research in order to save time on the translation process.

1.10 OVERVIEW OF THE THESIS

This thesis consists of six chapters.

The current chapter introduces the interests of the research. It also introduces and describes the context of the study and the history of environmental education policy in Namibia. A short synopsis is also given of Environmental Studies in the Namibian Lower Primary curriculum and the learner-centred approach to teaching and learning that this curriculum prescribes. An explanation of my role and interest in the study is provided as well as the research question and goals. Education quality is also introduced, which is the main reference for analysis of the key findings which are discussed in Chapter 5.

Chapter 2 provides an outline of the literature that informed the study as a whole. It includes a short description on how to address environmental learning in education. It also provides a detailed discussion of the key ideas that informed this study, namely active learning and active learning processes which emerged through the use of an active learning framework for lesson planning (O'Donoghue, 2001). This chapter also includes a synopsis of environmental learning in the Namibian curriculum context. Furthermore, the theory that informed the teaching and learning processes namely situated learning theory, is elaborated on in more detail and is also explored in terms of contemporary learning theories. Lastly, seven indicators included in the fabric model of education quality (Nikel & Lowe, 2010) are discussed and explored within the Namibian curriculum context.

Chapter 3 describes the research design and methodology. It gives a description of the different research methods that were used to generate the data and the analysis thereof. Data were generated by conducting individual interviews with teachers to obtain information about their background knowledge of Environmental Studies and what teaching methods they had used for this subject before the teacher professional development intervention of this study. Teachers' lesson plans, lesson observations and learners' work together with photographs were analysed together as mini-case stories. Focus-group discussions were held with teachers during their introduction to and reflections after the use of the active learning framework (O'Donoghue, 2001) analysis. A detailed description is provided of how ethical and validity issues were handled in the research, and how data were managed and processed throughout the research process.

Chapter 4 presents the findings of the study. Analytical Memo 1 consists of data drawn from the individual interviews in order to address the first goal of the study, namely **to investigate teachers' experiences with different teaching methods and strategies in teaching environmental topics in Environmental Studies (prior to the intervention)**. Mini-cases of the teachers' lessons that were observed are also described in this chapter to address the second goal of the study, which was **to describe and explore active learning processes emerging from a teacher professional development intervention introducing teachers to an active learning framework**. Analytical memo 2 was developed and drawn from a focus-group discussion which was based on the teachers' reflections on the use of this framework to address the second goal of the study as stated above.

Chapter 5 is a discussion of the evidence of the research activities and findings. The data presented in Chapter 4 are discussed in relation to the education quality indicators of Nikel and Lowe (2010) which address the third goal of the study, which was **to investigate how emergent active learning processes relate to education quality**. The main insights gained from this analysis process are presented as analytical statements in this chapter.

Chapter 6 presents recommendations that relate to the analytical statements that form part of Chapter 5. The chapter also synthesises the thesis and concludes the study.

CHAPTER 2

Environmental learning, active learning and education quality

2.1 INTRODUCTION

This chapter discusses the role of environmental learning in education. It elaborates on active learning as an approach to environmental learning in the *Environmental Studies Curriculum*. The active learning framework (O'Donoghue, 2001) that was used as an intervention tool to promote active learning is also discussed in more detail to understand the use of this framework in the *Environmental Studies Curriculum*. This subject forms part of the Namibian Lower Primary curriculum which makes provision for environmental learning (Section 1.4). The education quality indicators of Nickel and Lowe (2010) that were introduced in Section 1.5 are also explored and discussed in relation to a Namibian perspective of education quality. The situated learning theory of Lave and Wenger (1991) and the social learning theory of Wals (2007) are related to concepts of active learning and education quality to understand how these theories informed the study as a whole.

2.2 ADDRESSING ENVIRONMENTAL LEARNING IN EDUCATION

Today we are faced with environmental problems/issues/risks/concerns that are socially produced and due to this should also be socially addressed. According to Beck:

Environmental problems are not problems for our surroundings, but – in their origins and through their consequences – are thoroughly social problems, problems of people, their history, their living conditions, their relation to the world and reality, their social, cultural and political situations (1991, p. 81).

As environmental problems are not problems for our surroundings but social problems, we as human beings who are capable living organisms, have the ability to do something about it. Therefore we need to address these problems to bring about change for better living conditions and the sustainable use of our natural resources. Wals states that focus should be laid on “(critical) reflexivity and transformative (social) learning as a means to engage people meaningfully in the everyday struggle for a better world” (2007, p. 43). In order to bring about

change for better living conditions and the sustainable use of our natural resources we as human beings need to reconsider our relationship with the natural environment.

Lotz-Sisitka and Lupele state that “education cannot solve all problems but also recognise the fact that education is an important factor for empowering society to make the transition to a sustainable future” (2012, p. 4). This is evident in the Namibian *Environmental Studies Curriculum*. The Namibian curriculum took up responsibility to incorporate environmental learning to educate learners about environmental problems/issues/risks/concerns, in order to equip them with the knowledge, skills and attitudes on how to deal with environmental problems/issues/risks/concerns (Namibia. MBEC, 2005a). The abovementioned was put into practice with the use of an active learning framework in the *Environmental Studies Curriculum* in order to reinforce the educational quality of this subject as mentioned in Chapter 1 (Section 1.3).

The next section explains active learning and introduces the active learning framework (O’Donoghue, 2001) and its use in the *Environmental Studies Curriculum*.

2.3 ACTIVE LEARNING

Active learning processes require students to be engaged in the learning process through meaningful learning activities which will allow them to think about what they are doing (Prince, 2004; Bonwell & Eison, 1991). Instructional methods as proposed by O’Donoghue that promote active learning are experiential learning approaches which can be incorporated in the teaching and learning process by means of “experience (encounter); and discussion (dialogue) that challenged learners to think about (reflect on) experience” (1995, p. 4). Experiential learning is also accentuated by the United Nations Environment Programme which stipulates that “open and active processes of learning can also be described as learning by doing, discovery learning, hands-on learning, or experiential learning” (2006, p. 28). This programme furthermore states that “the learner is encouraged to investigate the world, find out about it with others, and engage in collaborative reflections and change-oriented actions” (ibid, 2006, p. 28).

The active learning framework of O’Donoghue (2001) relates to the work of Fien (1993), which makes provision to understand ideas *about* the environment that develop sensitivities and skills *in/through* the environment and foster values and attitudes that commit us to act *for* the

environment. Fien (1993) distinguishes education *about* and *in/through* the environment as well as education *for* the environment as different forms of environmental learning, each building on the other. In education *about* the environment, emphasis is on knowledge about the environment without any interaction with it or to act for it. Education *in/through* the environment is described by Fien as learner-centred with an aim “to add reality, relevance and practical experience to learning and to provide students with an appreciation of the environment through direct contact with it” (ibid, 1993, p. 16). This resonates with Cares’s argument that opportunities ought to be created by teachers for learners to go out and interact with the environment (Eaves, 2006).

Fien argues that “education *for* the environment has an overt agenda of values education and social change. It aims to engage students in the exploration and resolution of environmental issues and to help develop an informed concern *for* the environment” (1993, p. 16). Wals explains this process as “applying/experimenting – translating emergent ideas into collaborative actions based on the newly co-created frames, and testing them in an attempt to meet the challenges identified” (2007, p. 41). In order to practise education *about*, *in/through* and *for* the environment effectively the teaching of environmental learning is much more than only teaching learners the theoretical concepts about an environmental issue.

Fien’s three forms of environmental learning can be seen in O’Donoghue’s work where he states that:

Environmental learning is often spontaneous but is best when mediated with active learners in a local environment. With a relevant risk, issue or concern as a focus, learners can find out ‘about’ the environment, undertake investigations ‘in’ their local surroundings and do things ‘for’ a healthier and happier world (2001, p. 7).

In relation to the above quote, O’Donoghue (2001) developed a framework to portray how these processes can be planned and presented. This active learning framework will be discussed in detail in the next section.

2.4 AN ACTIVE LEARNING FRAMEWORK

O’Donoghue’s (2001) active learning framework that was introduced in my school was developed and trialled by the environmental education community in South Africa through

South Africa's National Environmental Education Programme (Lotz-Sisitka & Raven, 2001), and my interest was to research its implementation in the Namibian curriculum context. The dimensions of the active learning framework clearly indicate what should be done to address and understand an environmental problem/issue/risk/concern. The framework suggests activities to support identification of problems/issues/risks/concerns in the local environment in order to come up with ideas on how to respond to the problems/issues/risks/concerns they experience.

This framework for active learning has the potential to encourage learner-centred teaching. This is evident in O'Donoghue and Russo's work where they state that "in 1999-2001, as environment was identified as a concern within all learning areas in South Africa, an open process framework was abstracted as a tool for planning environmental learning and using materials in a more learner-centred school curriculum" (2004, p. 344). For this study the active learning framework was also used in a learner-centred school curriculum which is elaborated on in more detail in Section 1.3. O'Donoghue and Russo also note that "the active learning framework as a tool for planning environmental learning was rapidly picked up in professional development activities" (ibid, 2004, p. 344).

By the use of the active learning framework learners are not only taught about what they should know and are not only tested on the outcomes of what was taught, but the focus is also on how the learners come to know about the problems/issues/risks/concerns. Such a process interest in learning is captured by Rickinson who states that "we need to think carefully not only about 'the what' (foci and outcomes) but also about 'the how' (processes) of environmental learning" (2006, p. 448).

O'Donoghue's framework for active learning presents "an open picture of the interactive search for information about issues and for enquiry in a local setting, towards reporting and action for a better environment" (2001, p. 2). He developed this framework to model how environmental learning processes might be encouraged in lesson planning (see Figure 2.1).

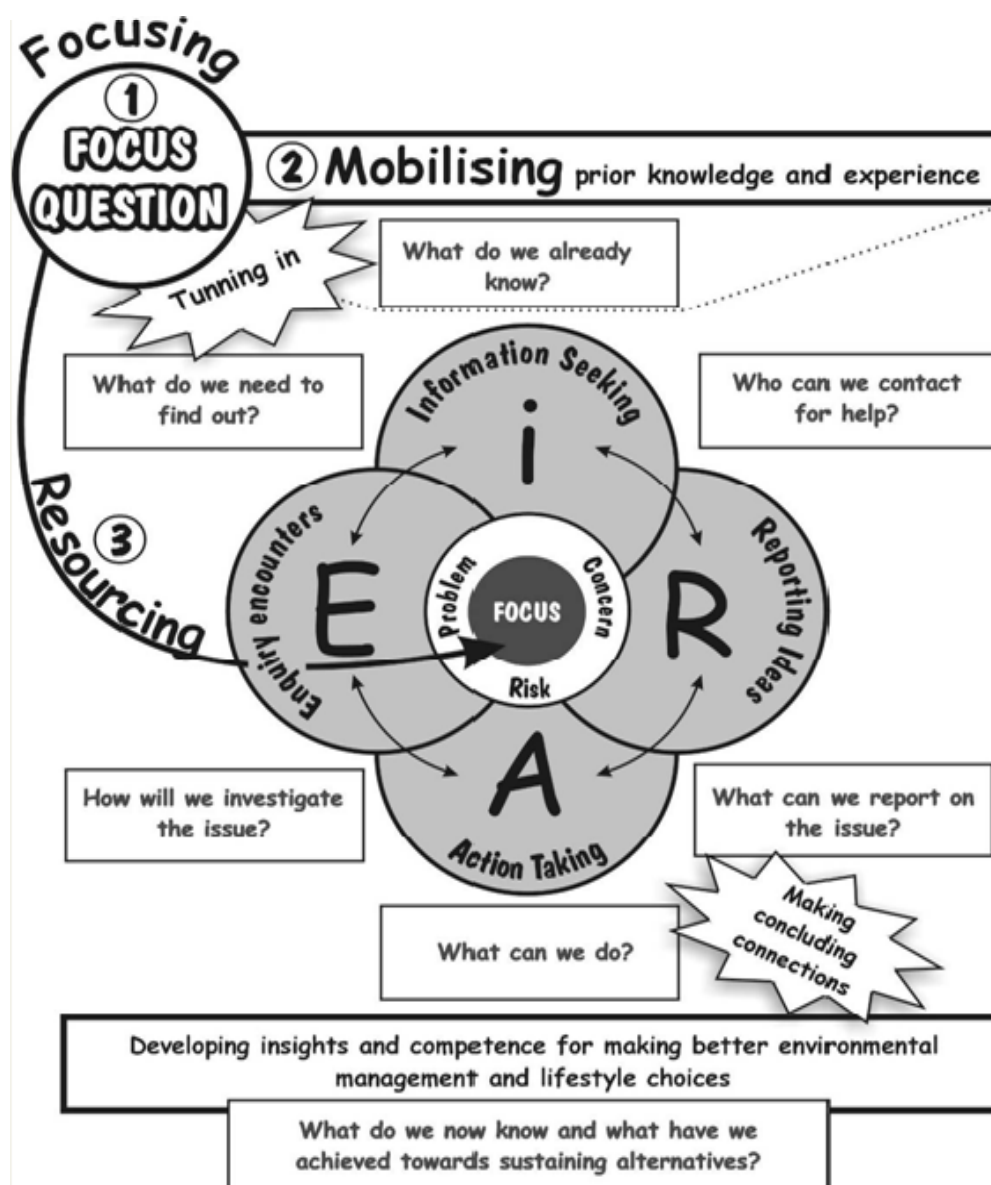


Figure 2.1 O'Donoghue's Active Learning Framework (2001)

In a study piloting the use of the active learning framework, Schudel, Dambuzza, Lotz-Sisitka, Magonare, O'Donoghue and Solomon describe its purpose as aiming “to encourage learners to become actively involved in addressing and responding to environmental issues” (2000, p. 6).

The following sections elaborate on the dimensions of the framework and how they can be implemented. It is important to note that the framework does not need to be used in a linear manner, as it has been developed to be an open-ended process and teaching can start with any of these dimensions (O'Donoghue, 2001).

2.4.1 Focus area

At the centre of the framework is the focus on a specific environmental problem/issue/risk/concern. This is seen as the tuning-in process. The tuning-in process is the starting point of the active learning framework which determines what the learners already know about the specific area of focus. This process relates to Wals's (2007) work where he calls it the orientation and exploration process which is referred to as "identifying key actors and, with them, key issues of concern or key challenges to address in a way that connects with their own prior experiences and background, thereby increasing their motivation and sense of purpose" (2007, p. 41). During this process the learners can discuss and jot down ideas of what they already know about the focus area and what they think is important (O'Donoghue, 2001). This gives the teacher and learners a clear picture of what content knowledge the learners do not know yet. From there the teacher can mediate the lesson with relevant mediation tools to address gaps in the learners' understanding of new content knowledge, understanding of local context or sustainability practices and alternatives. This focus sets up the nature/requirements for further exploration.

2.4.2 Information seeking

In the 'information seeking' dimension of the framework two questions can be asked to spark ideas to find information, such as: What do we need to find out? Who can we contact for help (O'Donoghue, 2001)? Different methods can be used to find information. Here the learners can be asked these two questions so that they can come up with ideas to find the information that they need for the area of focus. The teacher can also have this information ready to give to them or can just give them enough information to get started and then ask them to find out the rest in the library, magazines, pamphlets, textbooks, newspapers, internet or any other material that is related to the focus area to bring understanding (ibid, 2001). In this process the learners learn more about the problem/issue/risk/concern to help them understand it. This dimension allows for learning 'about' the environment (Fien, 1993).

2.4.3 Enquiry encounters

In the 'enquiry encounters' dimension of the framework the question can be asked: How will we investigate the issue (O'Donoghue, 2001)? This gives the learners the opportunity to

practically investigate the environmental problem/issue/risk/concern experienced in their area to understand the essence thereof. Here the learners can use questionnaires, environmental audits and interviews, do observations or go on excursions and so forth, to investigate the issue (ibid, 2001). Once the learners have the necessary information ready through the ‘enquiry’ they can give feedback of their ideas on what they found, based on the problem/issue/risk/concern.

The ‘enquiry’ process can also be done after an action was taken. The learners can investigate how the action was received by those involved in/affected by the environmental problem/issue/risk/concern that was acted upon. This dimension allows for learning ‘*in/through*’ the environment (Fien, 1993).

2.4.4 Action taking

In the action-taking process the question can be asked: What can we do (O’Donoghue, 2001)? This question can be asked to stimulate the learners’ background knowledge. Here the learners’ insights and contributions are also important. The teacher should find out from the learners what they think can be done before assisting them to come up with ideas on how to take action (ibid, 2001). Sometimes the learners will not be able to perform the action practically. In this case alternative suggestions can be made depending on what the learners’ circumstances and the availability of resources are (ibid, 2001). This dimension allows for learning ‘*for*’ the environment (Fien, 1993).

During the action-taking process the learners share their ideas and negotiate in dialogue what the best possible solution to the problem might be. When everybody is satisfied with the solution it is put into practice (O’Donoghue, 2001). This process develops learners’ action competence because they actively learn by doing something meaningful and worthwhile. Mogensen and Schnack argue that “the action competence approach points to democratic, participatory and action-oriented teaching-learning” (2010, p. 62). They furthermore elaborate that this action competence approach “can help students develop their ability, motivation and desire to play an active role in finding democratic solutions to problems/issues connected to sustainable development”(ibid, 2010, p. 62). The learners may also start with an action first to try out or explore a sustainability practice.

This study considered two main categories of environmental actions as delineated by Jensen and Schnack (2006, p. 478); namely direct and indirect environmental actions. Jensen and Schnack refer to “direct actions as actions which directly contribute to solving the environmental problem that is being worked on whereas indirect environmental action’s purpose is to influence others to do something to contribute to solving the environmental problem” (ibid, 2006, p. 478). For this study the actions that were taken into consideration for lesson presentations were based on ‘direct and indirect’ actions for the environment.

2.4.5 Reporting ideas

In the ‘reporting ideas’ dimension of the framework the following question can be asked: What can we report on this issue (O’Donoghue, 2001)? This question can be asked to stimulate dialogue between learners in order to report their ideas. Here the learners are encouraged to share what they can report on the problem/issue/risk/concern, give ideas on how they can deal with it and come up with practical things to do to address it (ibid, 2001). In this process the learners’ problem-solving skills are practised where they discuss what the best possible solution might be.

The learners can also report back on an enquiry, based on the environmental focus, or on the information-seeking process, or their response (action) to the problem/issue/risk/concern. This can be done in order to stimulate further exploration on the problem/issue/risk/concern.

When all dimensions of the active learning framework have been put into practice, the learners and the teacher can reflect back on the whole active learning experience. The reflection part of the whole process can be done as follows. Questions can be asked to provoke evaluation, reflection and further information seeking, enquiry and action. The questions can be: What do we now know, or what have we achieved, or how effective have we been (O’Donoghue, 2001)? This process allows learners to think critically about what they did, whether they made any difference, and if the process taught them anything new or not.

The reflection process can be linked to what is stipulated in the *Environmental Studies Curriculum* as a learner-centred approach that notes that “learners can gradually be given increasing responsibility to participate in evaluating their work, under the teacher’s guidance” (MBEC, 2005a, p. 94-95, Section 1.4). Here the learners are given the opportunity to look back on what they did to determine if they were successful or not and what they can do next time to improve on their findings.

Active learning processes promoted by the active learning framework encourage content knowledge to be situated in relation to the learners' own context and vice versa (O'Donoghue, 2001). In the next section situated learning theory is explored as a potential lens for viewing emergent active learning processes.

2.5 SITUATED LEARNING THEORY AND ACTIVE LEARNING PROCESSES

In the *Environmental Studies Curriculum* it is stipulated that "the starting point for teaching and learning is the fact that the learner brings to school a wealth of knowledge and social experience gained continually from the family, the community, and through interaction with the environment" (Namibia. MBEC, 2005b, p. 94). This can be linked to 'situated learning' where knowledge construction not only occurs in the classroom and not only comes from the expert (teacher), but where the learners' pre-knowledge and collaborative meaning making of conceptual and contextual knowledge are of utmost importance.

Lave and Wenger (1991) accentuate that situated learning is the idea that what is learned is specific to the situation in which it is learned. Anderson, Reder and Simon elaborate on situated learning theory in more detail when they explain that "greater emphasis should be given to the relationship between what is learned in the classroom and what is needed outside the classroom, and that this has been a valuable contribution of the situated learning movement" (1996, p. 5). This is evident in the *Environmental Studies Curriculum* where the topics that were included in the curriculum were directly taken from the learners' own context and life worlds (Namibia. MBEC, 2005a). Learning of content knowledge as situated can also be seen in Brown, Collins and Duguid's work where they note that "knowledge is situated, being in part a product of the activity, context, and culture in which it is developed and used" (1989, p. 32). Learning of content knowledge that is situated from learner to learner/teacher to learner/activity or practices/a particular culture/a particular context allows learners to become the centre of the teaching and learning process as desired by a learner-centred approach, whereby their contextual and cultural knowledge is seen as important, valuable and productive.

For this study a number of aspects of a situated approach to learning were explored in order to develop the language for describing active learning processes emerging from the use of the active learning framework. These were cooperation and collaboration, investigating phenomena

and interpreting data, critical thinking and problem solving (Namibia. MBEC, 2005a; Rosenberg, O'Donoghue & Olvitt, 2007). These aspects of situated learning are elaborated on below in relation to the dimensions of the active learning framework.

2.5.1 Cooperation and collaboration

According to Johnson, Johnson and Smith “cooperative learning is the instructional use of small groups so that students work together to maximise their own and each other’s learning” (1991, p. iii). Cooperative learning, however, can only be effective if learners work together in collaboration and understand the importance of each learner’s role in the different groups. As explained by Dillenbourg collaborative learning is “a situation in which particular forms of interaction among people are expected to occur, which would trigger learning mechanisms, but there is no guarantee that the expected interactions will actually occur” (1999, p. 5). He furthermore explains that “a general concern is to develop ways to increase the probability that some types of interaction occur” (ibid, 1999, p. 5).

An active learning element of co-operation and collaboration is the emphasis on cognitive engagement and active minds in the collaborative process. During this cooperative and collaborative process of teaching and learning, knowledge is situated relationally between learner and learner, and between the family/community members and the learner and vice versa. For example, learners can acquire information concerning the problem/issue/risk/concern at home and share it with the rest of the class members. Through cooperation and collaboration learning of content knowledge is socially situated and practised as learners and family/community members are actively engaged in the teaching and learning process. Beyond the political dimension of collaboration described above, learning interactions also need to support learners to be meaningfully and cognitively engaged in the teaching and learning process. This point is made by Vinjevoold and Taylor in their concern that:

Learning must involve cognitive and affecting activity and not merely movement and speech. Thus ... if not carefully structured and guided by the teacher, [educational activity] succeeds only in passing the time without engaging the cognitive faculties of participants, and thus results in little or no learning. (1999, p. 65).

Vygotsky’s (1978) theory can be linked with the situated learning theory as accentuated by Daniels (2004). Daniels explains Vygotsky’s theory that “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)” (2004, p. 33). If a child struggles to master a concept or a skill he can obtain help from more knowledgeable/skilful peers or adults working in cooperation and collaboration, and with enough practice the learner will be able to succeed in the task at hand before being capable of doing it independently (Vygotsky, 1978). Vygotsky (1978) refers to this as the zone of proximal development.

According to Berk and Winsler “Vygotsky emphasised that teachers must collaborate with children in joint cognitive activities carefully chosen to fit the child’s level of potential development, thereby advancing the child’s actual development” (1995, p. 104). The value of working in collaboration can be illustrated by Wals’s argument that through facilitated social learning “knowledge, values and action competence can develop in harmony to increase an individual’s, a group’s or a network’s possibilities to participate more fully and effectively in the resolution of emerging personal, organisational and/or societal issues” (Wals, 2007, p. 39). He furthermore mentions that “social learning tends to refer to learning that takes place when divergent interests, norms, values and constructions of reality meet in an environment that is conducive to meaningful interaction at the level of the individual, group, networks of actors and stakeholders” (ibid, 2007, p.39).

2.5.2 Investigating phenomena and interpreting data

According to Tudor and Ferguson “field investigations of the environment involve the systematic collection of data for the purposes of scientific understanding” (2007, p.1). They furthermore state that field investigations “are designed to answer an investigative question through the collection of evidence and the communication of results; they contribute to scientific knowledge by describing natural systems, noting differences in habitats, and identifying environmental trends and issues” (ibid, 2007, p. 1). From their point of view “field investigations help students become systems thinkers, learn the skills of scientific inquiry, and understand that science does not only happen in the laboratory or classroom” (ibid, 2007, p. 1). They furthermore note that “outdoor experiences in natural settings increase students’ problem-solving abilities and motivation to learn in social studies, science, language arts, and math” (ibid, 2007, p. 1).

Tudor and Ferguson note that in this process of exploring the world through field investigations, students become knowledgeable citizen researchers who add information to the community to understand an area of concern in order to “make issues of concern visible and share differing points of view about preservation and use of community natural resources” (2007, p. 1).

As fieldwork is designed to help understand a local environment it is a particularly significant method used to support the enquiry dimension of the active learning framework. For example, learners can do investigations in their environment to understand the problem/issue/risk/concern by completing questionnaires, audits or interviews. Here knowledge is situated in relation to the learners’ environment.

2.5.3 Critical thinking and problem solving

A document developed by the international environmental education community – the Bonn Declaration – calls for “creative and critical approaches, long-term thinking, innovative and empowerment for dealing with uncertainty, and for solving complex problems” (UNESCO, 2009, p. 2). Castle notes that “the challenge with the use of any type of teaching method is how to make the learner become a critical thinker” (1956, p. 85). According to Fisher “worthwhile thinking is thinking more about something. Critical thinking describes how something is being thought about” (1990, p. 65). He furthermore notes that learning to think critically means “learning how to question, when to question and what questions to ask, learning how to reason, when to use reasoning and what reasoning methods to use” (ibid, 1990, p. 66). Loubser’s view of critical thinking is that it “develops logical reasoning, creative thinking and problem-solving skills” (2005, p. 141). To solve problems learners need critical thinking skills. The teacher needs to find ways to engage learners to think critically to be able to solve problems in and around the classroom and their environment. According to *Towards Education for All* this requires “teaching techniques that fit the purpose and content of the lesson and at the same time encourages active learner participation” (Namibia. MEC, 1993, p. 60), for example, “explaining, demonstrating, posing questions, checking for understanding, helping, providing for active practice, and problem solving” (ibid, 1993, p. 60).

Critical thinking and problem solving are important at all stages of the active learning framework. In order to come up with a solution to address the problem/issue/risk/concern the

learners need to think critically in order to solve the problem which will allow them to take action to address the problem/issue/risk/concern. In order to come up with a solution learners are engaged in dialogue to discuss the possibilities that might enable them to solve the problem/issue/risk/concern (Wals, 2007).

In this study the approaches to teaching and learning explained above will be used as lenses to review the active learning processes emergent from the research intervention. The intention for this study was to explore the implementation of ‘active learning processes’ and the implications for education quality by implementing the active learning framework in order to strengthen the quality in education of the *Environmental Studies Curriculum* as introduced in Section 1.4.

Next the Namibian curriculum context will be explored to get an understanding of what it entails and how the active learning framework links to the Namibian curriculum context.

2.6 ENVIRONMENTAL LEARNING IN THE NAMIBIAN CURRICULUM CONTEXT

In the *Environmental Studies Curriculum* provision is made for environmental learning, whereby the learners’ own context is used to learn the importance of environmental problems/issues/risks/concerns in their everyday lives (Namibia. MBEC, 2005a). The use of learners’ existing knowledge is also evident in the Namibian curriculum where the learners’ background knowledge is seen as important to start the teaching and learning process (Namibia. MBEC, 2005a). In addition the *Environmental Learning Curriculum Guidelines for Educators* was developed to guide teachers with the implementation of environmental learning across the curriculum (Namibia. MBEC, 2005b). This document is discussed below.

2.6.1 The Namibian Environmental Learning Curriculum Guidelines for Educators

In the *Environmental Learning Curriculum Guidelines for Educators* environmental learning is discussed as one of five cross-curricular themes to be integrated within subjects wherever relevant and appropriate. In the *Environmental Learning Curriculum Guidelines for Educators* six main themes were identified which are relevant to understanding Namibia’s environment

and development. This document elaborates on how “elements of the themes can be found in most subjects and that environmental learning is therefore not a new or separate subject, but rather an orientation or emphasis within the existing curriculum” (Namibia. MBEC, 2005b, p. 17). This document gave insights and guidance to the development of lesson plans as its six main themes directly relate to the *Environmental Studies Curriculum*.

The *Environmental Learning Curriculum Guideline for Educators* states that “all subjects of the curriculum can make a contribution to developing environmental learning, while in turn environmental learning can bring new perspectives to these subjects” (Namibia. MBEC, 2005b, p. 19). The *Environmental Learning Curriculum Guideline for Educators* was mainly used to bring new perspectives to the *Environmental Studies Curriculum* as it portrays several case stories of environmental issues that have been addressed. These examples were used to give the teachers who took part in the study, guidance and insights in developing their lesson plans based on the issues identified in the *Environmental Studies Curriculum*. The study of this document was done during a focus group discussion for the training of teachers on how to plan and present lessons making use of the active learning framework as mentioned in Section 1.3. Next the *Environmental Studies Curriculum* will be discussed.

2.6.2 The Namibian Environmental Studies Curriculum

A curriculum is “a framework for devising syllabus, learning materials and textbooks to be used in various subjects and areas of learning, from which a teacher’s schemes of work and lesson plans can be developed, so that the goal and aims will be put into practice in a consistent manner” (Namibia. MoE, 2010, p. 1). For this study the *Environmental Studies Curriculum* was put into practice as stated by the above quote stated in the Ministerial document of Education (2010).

As the *Environmental Studies Curriculum* was used as the basis of this study I am going to elaborate on it in this section by looking at the content of the subject and the context in which it was developed in order to clarify the line of argument for environmental learning. The *Environmental Studies Curriculum* was developed to teach learners about environmental content and concepts, to become aware of problems/issues/risks/concerns and to apply the knowledge learnt to their everyday lives (Namibia. MBEC, 2005a). The active learning framework also encourages environmental awareness based on environmental

problems/issues/risks/concerns (O'Donoghue, 2001). In the *Environmental Studies Curriculum* the Lower Primary Phase emphasises “understanding the local, social and natural environment and applying new concepts in a known context” (Namibia. MBEC, 2005a, p. 91) (Section 1.4). The main aim of the *Environmental Studies Curriculum* is to teach the learners about their immediate environment and what is happening in their daily lives (ibid, 2005a, p. 91). Teaching learners about their immediate environment is also highlighted by (O'Donoghue, 2001).

In the *Environmental Studies Curriculum* it is stated that “learning experiences in the social sphere help learners see and understand the relationships between people and their environments” (Namibia. MBEC, 2005a, p. 91). These learning experiences and interactions occurring within the social sphere serve as a means to encourage “learners to become responsible citizens in their community, and eventually their country, continent and the world, through the development of essential knowledge, understanding, skills and attitudes” (ibid, 2005a, p. 91).

It is stipulated in the *Environmental Studies Curriculum* that the three broad themes, the Social Environment, Health, Safety and Nutrition and the Natural Environment “are not to be seen as separate compartments and topics should be taught across all three” (Namibia. MBEC, 2005, p. 91-92). This implies a relational approach to social-ecological concerns as highlighted by Hattingh who states that the “economic, socio-political and environmental considerations do not each have their own logic and values separate from the other spheres” (2004, p. 157). He furthermore notes that the spheres “are intertwined from the outset – to such an extent that a fundamental rethink is required of everything that we up until now have conceptualised as economic, socio-political engagement, and the environment” (ibid, 2004, p. 157). He also accentuates that “without an ecological context, the social and economic would cease to exist” (ibid, 2004, p. 157). This presents a vision of environmental learning as an exploration of interrelated processes of the natural, socio-political and economic environment.

Environmental Studies as a subject also has its own time period as stipulated in the curriculum (Namibia. MBEC, 2005a). Encouraging environmental learning as a separate time period is also evident in Chatzifotiou's work where “teachers appear to believe that environmental education needs a separate time period in the curriculum because of its high scientific demands” (2005, p. 518). For example, when teaching Grade 4 learners about waste management and the effects thereof all the waste management areas need to be focused on, such as different types of pollution, hazardous and non-hazardous waste, root causes and effects/impacts that waste has

on all living organisms and so forth, and sometimes the time given to teach these high demanding topics is not enough.

The *Environmental Studies Curriculum* is seen as the main carrier subject which allows for integration across all subject areas (Namibia, MBEC, 2005a); “this integrated approach enables learners to see society and nature as a whole, rather than by learning about them in separate subjects” (Namibia, MBEC, 2005a, p. 91). For instance, the topic ‘Water’ in the *Environmental Studies Curriculum* will be taught across all subjects or where environmental issues could be addressed.

For instance, in the subject English, a story about water can be done with the learners that might have been used as a lesson to introduce the topic of water in the subject *Environmental Studies*. This same story can be used as a comprehension lesson or to teach learners certain grammatical structures (e.g. prepositions) of the subject English. In Mathematics the learners can find out how much water each learner uses per day and this can be displayed in a graph in order to determine how much water this specific class is using. This information can then be used in the subject *Environmental Studies* in order to encourage sustainable use of water. In the subject Religious and Moral Education the teacher can teach the learners the value of water to all animals, plants and people. The value of the natural resource water that was created by God should be taught to the learners in order to instill values education based on this topic. Learners should come to understand, that without water we cannot survive and that we need to use it sparingly. In Arts learners can do a role play on the different ways water can be used sparingly or saved.

As I am interested in the relationship between active learning processes and education quality within the *Environmental Studies Curriculum*, the education quality indicators of Nikel and Lowe (2010) will be discussed in the next section.

2.7 THE ‘FABRIC’ MODEL OF EDUCATIONAL QUALITY

Education quality is not an easy concept to understand because it has many different meanings (Barret, 2006). Drawing on these different perceptions of education quality, Nikel and Lowe developed a number of education quality indicators in response to their critique of existing models presented in recent studies (2010, p. 594). Included in the literature were the

perspectives of Barret (2006); see also Rosenberg (2008); Shumba, Kasemba, Mukundu and Muzenda (2008); and Lupele and Lotz-Sisitka (2012).

Nikel and Lowe point out that there is increased “public and policy awareness of the risk and vulnerability many low-income countries face, not only in terms of economic and social challenges,” but also “in terms of global environmental change, with the effects of climate change being the most prominent” (2010, p. 590). Nikel and Lowe point out that increasingly highlighted:

is the role of education in enabling the creation of ‘sustainable livelihoods’, the responsible management of natural resources, the development of ‘coping capacity’ and building resilience among local stakeholders to respond to complexity and change within global issues, such as global warming, and their local relevance” (2010, p. 590; see also Fakir, 2002; Berkes, Folke & Colding, 2003).

Nikel and Lowe accentuate that “while we have taken onboard the idea of clarifying a concept’s meaning (the quality in education) through its dimensions, we are interested in providing a framework that extends beyond considerations of classroom activity” (2010, p. 594), and more importantly, “to emphasise the importance of balance among the constituent dimensions” (ibid, 2010, p. 594). Nikel and Lowe (2010) propose the seven conceptual dimensions of education quality as effectiveness, efficiency, equity, responsiveness, relevance, reflexivity and sustainability (Figure 2.2).

Nikel and Lowe present these indicators in a fabric model that emphasises their “view of the quality of education as being like a ‘fabric’ that is at its strongest when ‘stretched’ or maintained in tension” (2010, p. 594). This means that “this model emphasises the need to seek a contextually relevant balance among the seven dimensions, where ‘balance’ does not imply a simple equalising across all seven – even if that were conceptually possible” (ibid, 2010, p. 594). Nikel and Lowe also explain that “the needs and the possibilities for action within different educational contexts will vary and decisions must be made over what is desirable and feasible within a specific situation” (ibid, 2010, p. 594). These seven quality indicators formed a reference for assessing the relationship between emergent active learning processes and education quality in the *Environmental Studies Curriculum*.



Figure 2.2 Nickel and Lowe’s educational quality model (2010)

Nickel and Lowe’s (2010) elaboration on these seven indicators are discussed from 2.7.1 to 2.7.7.

2.7.1 Effectiveness

Nickel and Lowe describe effectiveness as “the extent to which stated (educational) aims are met”. They specify that conventionally “the definition directs attention to outcomes or ‘final states’ only, without an explicit recognition of initial conditions” (2010, p. 595). They then argue that “a concern with initial conditions – the socio-economic backgrounds of the pupils in a school or their initial learning achievements – leads to a ‘value added’ interpretation of effectiveness that insists we measure the progress made from a given starting point” (ibid, 2010, p. 595). This means that a closer look will be given to what the learners already know and what new meaningful knowledge they have learnt as stipulated in the *Environmental Studies Curriculum* (Namibia. MBEC, 2005a). For every topic planned during the intervention process

of the research, objectives were stated before the implementation of each topic as required by the Namibian *Environmental Studies Curriculum*. Achievement of objectives was one of the foci of analysis in this study (Section 4.3). However, heed was also taken of emergent teaching and learning processes that were not stated beforehand in the objectives, which might indicate value added in relation to the learners' existing knowledge.

In addition to the objectives and basic competencies as measures to determine the degree of effectiveness the passing requirement for this subject will also be taken into consideration in this study. Passing requirements are as follows: An A symbol is 81%-100%; a B symbol is 61%-80%; a C symbol is 41%-60%; a D symbol is 32%-40%; and an E symbol is 0%-31%. In order to pass *Environmental Studies* a learner must obtain a D symbol which starts at 32%.

Nikel and Lowe also warn that “only some of the many desirable outcomes that we might specify for education will lend themselves to such easy quantification, so that we are drawn into the fallacy of replacing what is important with what is measureable” (2010, p. 596). In this research the competence focus was not only based on measureable targets such as tests/worksheets/written activities, but also on learners' competence as illustrated through content knowledge application during the teaching and learning processes. For example, the practical application of content knowledge through active learning was taken into consideration in addition to measuring content knowledge based on paper and pencil tests. This meant that formative as well as summative assessment was used to determine the degree of effectiveness. Formative assessment was explored during the active learning processes by giving learners practical activities whereby they actively practised the content that was taught to them, for example, to take action on the issue/concern/risk that they were focusing on. This was followed by summative assessment activities by giving the learners tests/worksheets/written activities to determine how well they had mastered the content that was taught to them and that was put into practice by them.

Nikel and Lowe also indicate that “we need to be aware of outcomes and impacts – both positive and negative – that are not pre-specified as those effects which we may fail to see, let alone measure, perhaps leading to a judgement of ineffectiveness when in fact the system or institution is having considerable impact in areas where we are not looking” (2010, p. 596). In this study cognisance was taken of this point where we need to be aware of outcomes and impacts which may be positive or negative. For example, the teacher ought to be able to sense if learners do not understand the content knowledge and act accordingly by re-teaching, and

where learners are well informed about the content knowledge, the teacher needs to challenge these learners by giving them more challenging activities.

2.7.2 Efficiency

Nikel and Lowe state that “it is with efficiency and its definition as the ratio of outputs to inputs that economic considerations such as the maximising of resource use enter the interpretation of the quality of education” (2010, p. 596). Analysis in this study considered the amount of time, effort, financial or other resources that were included in lesson presentations and how this affected the quality of education. This is elaborated on in more detail in Section 5.3.

Towards Education for All (1993) notes that materials used ought to be learner-friendly, stimulating, and easy to use, in order to meet the needs of the learners. Resources used should engage attention and involve learners actively with combined challenge and enjoyment. This document further highlights that “materials of this sort are also carefully designed for specific learning objectives, to get a message across, to help learners understand, and to be easy for the teacher to use” (ibid, 1993, p. 61). For the implementation of this project using the active learning framework we as the participants in this study designed and used resources to the best of our abilities as stated above.

Nikel and Lowe also argue that “although the concept of efficiency is most commonly applied at the macro- and meso-scale systems and institutions – it may also be invoked in relation to the participation of individuals in education, both pupils (or their families) and teachers” (2010, p. 596). They also indicate that “the amount of time, effort, financial or other resources invested by these individuals may be influenced by considerations of ‘whether it is worth my while’, which in turn influences the quality [in] education that is actually desired to be achieved” (ibid, 2010, p. 596).

Another important point made by Nikel and Lowe is that “beliefs and value judgements that cannot be reduced to economic considerations may play an important part here” (2010, 596). The learners and parents should feel that what is taught is worthwhile, meaningful and useful, and what is taught in school will prepare their children for adulthood to act as valuable citizens for their country.

2.7.3 Equity

Nikel and Lowe included equity as a dimension and “part of an overall judgement of quality in education and not as a separate concern associated primarily with issues of access” (2010, p 596). Their view here is not only based on education as a human right “as a potential source of social transformation, [and] with a concern for social justice” (ibid, 2010, p. 596). They also state that “education would be considered equitable to the extent that it mobilises the potential of education to address economic, political and social inequalities” (ibid, 2010, p. 596). For this study as stated above by Nikel and Lowe (2010), equity will not only be looked at primarily with issues of access and as a potential source of social transformation, and with a concern for social justice but focus will also be laid on the potential of education to address economic, political and social inequalities based on the issues that were addressed in this study.

Nikel and Lowe furthermore note that “to expand opportunities available to disadvantaged individuals, recognising that the source of the individual disadvantaged may be structural and associated with shared group characteristics such as gender, ethnicity, location and poverty” (2010, p. 596). Heed will be taken in this study of the importance of “potential inequalities among students, deriving from gender, disability, race and ethnicity, HIV/Aids status and situations of emergency. These differences in learner characteristics often require special responses if quality is to be improved” (Ankomah, Koomson, Bosua & Oduro, 2005, p. 4).

In the *Environmental Studies Curriculum* the issue of equity is presented particularly in terms of gender equality. This is evident in the statement that “gender perspectives are important in all social themes in order to raise awareness of gender stereotyping, how limitations are set on gender equity, and how to promote gender equity in all spheres of life” (Namibia. MBEC, 2005a, p. 93-94). When studying the natural environment in science for example, “it is particularly important for girls to feel confident from the start in order to provide motivation to continue in Natural Science throughout their career and beyond” (ibid, 2005a, p. 93-94).

2.7.4 Responsiveness

Nikel and Lowe state that “the emergence of ‘responsiveness’ within the quality debate paralleled the ongoing debate and lobby for considering equity issues in quality education” (2010, p. 597). They explain that “equity refers to the analysis of group-based and structurally

mediated outcomes related to social justice concerns” (ibid, 2010, p. 597). They elaborate that “responsiveness on the other hand focuses on individual diversity and difference in learning environments, learning abilities and styles, but also on responding to environmental changes that might affect individual learning ability and willingness to engage” (ibid, 2010, p. 597).

In the *Environmental Studies Curriculum* it is stipulated that learners ought to be taught according to their learning abilities and styles in order to willingly respond to the teaching and learning process. The *Environmental Studies Curriculum* notes that “nearly all learners will be able to achieve more than a satisfactory minimum in the basic competencies; some will be able to do much better” (Namibia. MBEC, 2005a, p. 91). It is furthermore stipulated that a small number of “learners will just be able to manage satisfactorily, and must receive support teaching through adapted teaching approaches, adapted materials, and assistance from peers” (ibid, 2005a, p. 91). In order to get learners engaged in environmental learning the teaching and learning processes should be designed in such a way that all learners with different abilities will be able to engage in the teaching and learning process. If this is the case, all learners ought to be able to respond to what is taught in the lesson presentations and will feel of equal value in the teaching and learning process.

Nikel and Lowe stipulate that “responsiveness in classroom interaction can be extended further towards a stronger acknowledgement of the aspects of personal growth and the social nature of this process” (2010, p. 597). They furthermore note that “then, responsiveness more broadly represents a concern for the learner ‘becoming oneself’ through education” (ibid, 2010, p. 597). Becoming oneself through education is presented in Wals’s work where he describes “orientation and exploration [as] identifying key actors and, with them, key issues of concern or key challenges to address in a way that connects with their own prior experiences and background, thereby increasing their motivation and sense of purpose” (2007, p. 41).

2.7.5 Relevance

Nikel and Lowe state that “the relevance of an education system/educational experience is the extent to which it addresses user needs, but the identification of needs is a complex and often contradictory process; needs may be expressed at various levels: individually, family, community, national and global” (2010, p. 597). According to them tensions may arise “between the needs expressed at different levels, and different groups within each level – rural

and urban communities, socio-economic classes, and so on – and the outcomes of decisions about priorities will reflect contextually specific cultural and political struggles” (ibid, 2010, p. 597).

According to Nikel and Lowe “firstly, there is the issue of who makes decisions about what is relevant to needs, at any level. In many countries, however, the co-existence of private and public systems makes the ‘democratic’ individual choice of relevance differentially available according to income” (2010, p. 597). In *Towards Education for All* it is stipulated that the “curriculum must be relevant both to the needs of learners and to society” (Namibia. MEC, 1993, p. 59). It also notes that “learners will find the curriculum relevant only if the knowledge, skills, and values to be acquired are meaningful to them. If they feel that what they learn and how they learn it are significant, interesting, and useful, they will enjoy learning more and put more effort into it” (ibid, 1993, p. 59). In the *Environmental Studies Curriculum* the content knowledge is very largely taken from and related to the learners’ immediate environment and community (Namibia. MBEC, 2005a). This is also emphasised by Wals and Van der Leij that “environmental education, by its very nature, should be education that focuses on the life-world of the learner” (1997, p. 18). It is also stipulated in the *Environmental Studies Curriculum* that *Environmental Studies* “helps learners to become responsible citizens in their community, and eventually their country, continent and the world” (Namibia. MBEC, 2005a, p. 91). This interest in the value of learning to individuals and their local communities was another factor considered in analysing quality in this study.

Nikel and Lowe furthermore state that “secondly, we must ask about the time-scale for which relevance is identified: children in school may be 15 years or more away from even beginning to assume the social, political and economic roles of adulthood for which their education is intended to prepare them” (2010, p. 597). Therefore they argue that “only in societies with the lowest levels of social mobility, or where social mobility is deliberately inhibited, can we assume that the roles of today’s children when they become adults will be the same as those of their parents” (ibid, 2010, p. 597).

Nikel and Lowe explain that “thirdly, the ‘shelf life’ of much knowledge is becoming increasingly shortened and much of it becomes at best a sort of temporary scaffolding on which more enduringly useful cognitive development may be built” (2010, p. 598). They furthermore state: “... thus we see education systems across the world promoting the development of ‘generic’ or ‘transferable’ skills as the most relevant curricular content” (ibid, 2010, p. 598).

In the *Environmental Studies Curriculum* it is stated that the everyday lives of the learners should be used to teach concepts for them to be able to understand and apply the knowledge, skills and attitudes in their everyday lives and to contribute to society (Namibia. MBEC, 2005a, Section 1.4). In turn this can only be possible if the concepts that ought to be taught to them according to the curriculum can be related to their life worlds.

In addition to the abovementioned, content knowledge should not be limited to the learners' own context, but they should be made aware that environmental problems/issues/risks/concerns in their local environment may also exist in other parts of the country or the rest of the world, for that matter. Hence, a further step ought to be taken to emphasise the global world when teaching the different environmental topics. Their immediate life worlds may not be the end of the learning process and the content knowledge ought to be extended nationally and globally (Nikel & Lowe, 2010).

2.7.6 Sustainability

Nikel and Lowe state that in their fabric model “‘sustainability’ represents concerns over the contribution of education for individuals, communities and nations taking up responsibility for global environmental changes and the uncertainty over the well-being of future generations” (2010, p. 598). It is stipulated in the curriculum that sustainability “includes understanding how people use the natural environment to satisfy human needs, and how the environment may be changed in ecologically sustainable ways” (ibid, 2010, p. 598). In the *Environmental Studies Curriculum* it is stated that “learning experiences in the natural scientific sphere aim at increasing the learners’ knowledge and understanding of the physical and biological world of which they are part” (Namibia. MBEC, 2005a, p. 91).

Nikel and Lowe furthermore describe “two distinct educational approaches to the development of the knowledge, skills and values to promote responsibility for making progress towards sustainable development: the transmissive and the transformative” (2010, p. 598). They further explain that the “first assumes sustainable development to be a normative concept about which the knowledge, skills and values needed to bring about the required change are (typically already) known” (ibid, 2010, p. 598). They argue that “the latter treats sustainable development as a procedural concept where ultimately it is not known – nor can it be known – what the individual might be able to contribute or what knowledge, skills and values might be most

appropriate in all circumstances” (ibid, 2010, p. 598). They state consequently, in the transformative approach (the procedural concept) “education focuses on behaviour change and acceptance of responsibility on which one must act, or participation by all stakeholders and parties in processes of goal-setting, decision-making and evaluation” (ibid, 2010, p. 598).

The educational approach that is referred to in the Namibian curriculum for making progress towards sustainable development is based on the transformative approach. In the *Environmental Studies Curriculum* it is stated that learners should be taught in order to live and act sustainably towards our natural resources (Namibia. MBEC, 2005a) in a way that will promote involvement in practical activities to preserve and sustain the natural resources (Namibia. MEC, 1993). As a learner-centred approach to teaching and learning requires a focus on learners’ prior knowledge the teacher might not know beforehand what the learners might know about sustainability or what sustainability practices they are already familiar with. This means the teacher will not know beforehand with what knowledge the learners will come to the classroom, just as the learners do not know with what knowledge the teacher will come to the classroom. In both cases both parties need to work together to come up with suitable sustainability practices or to do enquires regarding which sustainability practices would work best in their context.

Nikel and Lowe argue that “compared to relevance, sustainability represents an extension of consideration of the scope of educational impact and responsibility in terms of temporal scale (beyond one generation) and geographical scale (recognising the limitations of natural resources and nature as well as aiming to integrate decision making, linking the local with the global)” (2010, p. 599). In the *Environmental Studies Curriculum* this point is not explicitly stipulated. However, linking the local with the global will be considered in this study to broaden the notion of education quality of the teaching and learning processes as emerging from the research intervention.

2.7.7 Reflexivity

Nikel and Lowe state that “reflexivity brings in considerations of theories of modernity and the role of education in a social context characterised by the immense challenge to be able to orientate oneself in a time of rapid change” (2010, p. 598). They argue that reflexivity in this context represents two phenomena: “on the one hand, it represents the increased awareness of the existence of a feedback loop embracing human action and the conditions within which it takes place” (ibid, 2010, p. 598). They further elaborate on this matter that “these conditions are

altered by the action in ways that include the unanticipated as well as the intended effects; resulting from this is the necessity for increased reflexivity on the part of the individual” (ibid, 2010, p. 598). Therefore they argue their concern for considering the contribution of education to a learner’s orientation in a rapidly changing world. The role of education should be to orientate learners to be able to reflect on and to understand human activity and context as a feedback loop (Nikel & Lowe, 2010). This relates to the statement in the *Environmental Studies Curriculum* that learning should develop learners’ critical thinking skills to become reflective thinkers in society (Namibia. MBEC, 2005a).

Nikel and Lowe furthermore argue that “it is important to distinguish this dimension from the earlier one of responsiveness. The latter refers primarily to the capacity of the system to respond to individual differences, whereas ‘reflexivity’ captures a concern that is shared by all in engaging with an uncertain future” (ibid, 2010, p. 598). This concern for reflexivity is also evident in Wals’s work where he explains that “social learning requires reflection and reflexivity throughout the entire process, if only to improve the quality of the process itself and to monitor change and progress throughout” (2007, p. 41).

2.8 CONCLUSION

This chapter provided a broad picture of the role of education in environmental learning (Section 2.2), active learning (Section 2.3) and what the education quality indicators of Nikel and Lowe (2010) entail (Section 2.7).

As stated by Beck (1991, Section 2.2), we are faced with numerous environmental problems/issues/risks/concerns, and it is the responsibility of education to take the initiative to address environmental problems/issues/risks/concerns. In order to bring Beck’s (1991) statement into practice the active learning framework was presented as a tool to use for planning and teaching environmental learning topics in the *Environmental Studies Curriculum*. With this active learning framework (Section 2.4) which encourages situated active learning processes (Section 2.5) a number of situated approaches were explored (Section 2.5) to enhance the analysis of emergent active learning processes.

Furthermore, the education quality indicators of Nikel and Lowe’s (2010) model (Section 2.7) were discussed in order to determine their relationship with active learning processes emerging from the use of the active learning framework.

From Nikel and Lowe's (2010) point of view they extended existing models of educational quality and came up with their own model which broadens conventional perspectives on educational quality indicators. They state that effectiveness should not look at outcomes or final states only, but that we need to look at the relationship between initial conditions as well as the unintended that is a 'value added' interpretation of effectiveness (ibid, 2010). Nikel and Lowe refer to efficiency not only as a relation between outputs and inputs in terms of economic considerations such as the maximisation of resource use, but also as the participation of individuals in education, both pupils (or their families) and teachers and the amount of time, effort, financial or other resources invested by these individuals (ibid, 2010). They also extend it in terms of broadening effectiveness beyond developing learners to participate in the economy, but also to participate as valued citizens in society (ibid, 2010). Equity is seen as more than issues of access in education (ibid, 2010). Equity is referred to as a potential source of social transformation and with a concern for social justice, and that education would be considered equitable to the extent that it mobilises the potential of education to address economic, political and social inequalities (ibid, 2010). Responsiveness focuses on individual diversity and difference in learning environments, learning abilities and styles, as well as environmental changes that might influence individual learning ability and willingness to engage (ibid, 2010). From their point of view relevance is not just about an education system/educational experience to address user needs, but that reflection on needs is a complex and often a contradictory process. Needs may be expressed at various levels: individual, family, community, national and global (ibid, 2010). Reflexivity is referred to not only as the capacity of the system to respond to individual differences but also to capture a concern that is shared by all in engaging with an uncertain future (ibid, 2010). Lastly, they added sustainability as part of their model. Sustainability to them represents an extension of considering the scope of educational impact and responsibility in terms of focusing on more than one generation and recognising the limitations of natural resources and nature as well as aiming to integrate decision making, linking the local with the global (ibid, 2010). These indicators became the reference for this research project.

The next chapter explains the research design, and how the research was conducted.

CHAPTER 3

Research design

3.1 INTRODUCTION

This chapter describes the methodological framework that guided the research process. It includes a description of the reasons for selecting an interpretive, qualitative case-study approach together with a quantitative approach to address the research question and goals. The different techniques that were used for data generation are described together with an explanation of the rationale for each technique. The description of the research process includes an explanation of how data were generated and analysed. Validity, trustworthiness and ethical considerations are discussed in the last part of the chapter.

3.2 RESEARCH METHODOLOGY

3.2.1 Mixed methods approaches to social inquiry

The research was a mixed methods study dominated by qualitative methods with inclusion of some quantitative data. Mixed methods approaches to social inquiry are said to uniquely generate better understanding in many contexts than studies bounded by a single methodological tradition (Weisner, Kreider, Mayer, Hencke & Vaughan, 2005). As cited in Weisner *et al*, Greene stipulates that “mixed methods social inquiry are found partly in the construct of triangulation, which involves the use of multiple methods – each representing a different perspective or lens – to assess a given phenomenon, in order to enhance confidence in the validity of the findings” (2005, p. 260). It is furthermore stated by Welman, Kruger and Mitchell that “the purpose of both quantitative and qualitative research is to try to understand the subject’s point of view” (2005, p. 9). They furthermore point out that:

Quantitative researchers do it by means of controlling the situation and using remote, empirical, and inferential methods. Qualitative researchers on the other hand, use unstructured interviewing and detailed observation processes to gain better information about the views of the subject (ibid, 2005, p. 9).

Van Maanen describes a qualitative approach to research as “an ‘umbrella’ phrase covering an array of interpretive techniques which seek to describe, decode, translate, and otherwise come

to terms with the meaning of naturally occurring phenomena in the social world” (1979, p. 520). In this study the interpretive technique with a qualitative approach provided new insights into the social world focusing on how people (teachers and learners) learn in their natural environment during an intervention process (using an active learning framework). Furthermore, it provided an understanding of what emerged from the intervention with the use of education quality indicators as a lens for a commentary on educational quality. The interpretive technique enabled meaning making of what exists in the participants’ minds, their experiences and interpretations (Leedy & Ormrod, 2010).

Leedy and Ormrod explain that “all qualitative approaches have two things in common. First they focus on phenomena that occur in natural settings – that is, in the ‘real world’. And second they involve studying those phenomena in all their complexity” (2010, p. 135). Leedy and Ormrod also state that “interpretation enables a researcher to gain new insights about a particular phenomenon” (ibid, 2010, p. 135). The phenomenon that I investigated was the relationship between active learning processes (with the use of the active learning framework) and education quality in the Namibian *Environmental Studies Curriculum*.

Furthermore, Welman, Kruger and Mitchell note that “the purpose of quantitative research is to evaluate objective data consisting of numbers” (2005, p. 8). In this research data were evaluated by means of numbers by looking at what marks the learners scored for the written activities that they did at the end of each topic presentations. This was done by converting the marks to percentages to get uniformity with the analysis of the data (learners’ work). The quantitative interpretation of marks, relates to one of the education quality indicators that was used in this study, namely effectiveness as discussed in section 2.7.1. Marks provided an indicator of whether the specified aims and objectives of the topics’ taught were met or not (Section 2.7.1).

Best and Kahn, define quantification as “a numerical method of describing observations of materials or characteristics. When a defined portion of the material or characteristic is used as a standard for measuring any sample, a valid and precise method of data description is provided” (2006, p. 289). As stated by Best and Kahn, using a numerical method of document analysis which in this case was to analyse the learners’ work, gave me a deeper insight into how the learners performed. Welman, Kruger and Mitchell furthermore accentuate that “the purpose of quantitative research is not to deal directly with everyday life, but rather with an abstraction of reality” (2005, p. 8).

3.2.2 Case study

This research can be described as an interpretive case study. Anderson argues that “a case study involves a detailed investigation into a situation in a single case or a small number of related cases. It is a strategy that allows for a problem or issue to be studied in depth, within the context of the case(s)” (2009, p. 53). The case was based on an intervention with four teachers teaching *Environmental Studies* in the Lower Primary Phase, who used an active learning framework to plan and present lessons based on environmental topics.

By conducting a case study I hoped to retain the characteristics of real-life events and thereby understand complex phenomena (Yin, 2009). The data which emerged from the use of the active learning framework were analysed in relation to the education quality indicators of Nikel and Lowe (2010).

3.3 DATA GENERATION

Data were generated from four methods appropriate to qualitative case study research, namely semi-structured interviews, focus-group discussions, classroom observations and document analysis; as well as from one method appropriate to quantitative standardised tests research, namely, group testing. The data were generated over a period of six months in 2012.

This research was based on two phases of data generation:

Phase 1 included semi-structured interviews with the teachers who participated in the study. Thereafter, in a focus-group discussion, I gave the teachers feedback on the interviews conducted about the different methods and strategies used across the grades. I also gave my views on the responses to the individual interviews so that my input regarding the phenomena could also be included. This was important because of my role as participant-observer in the study. Data generation in this phase were analysed to respond to the first goal of the study – **to investigate teachers’ experiences with different teaching methods and strategies in teaching Environmental Studies (prior to the intervention).**

Phase 2 consisted of a series of workshops. In the first focus-group discussion I gave the teachers a booklet outlining the active learning framework (O’Donoghue, 2001). I did this to see whether they would be interested in learning more about the framework. After they had read

the booklet I asked them whether they were interested in presenting lessons according to this framework, and they all agreed to be involved in the intervention process of this research project. Thereafter I conducted a workshop with them in order to present the framework and possibilities for its implementation. When all the teachers understood the framework as a process of teaching and learning, we all designed and presented our lessons using 4-7 periods each for the class grade that we were teaching. After all the lessons were presented and transcribed I conducted a second focus-group discussion in which all of us reflected on the lesson presentations and observations. This was done to discuss the teachers' experiences with the active learning framework. This intervention was described and explored through Goal 2 of the research which was **to describe and explore active learning processes emerging from a teacher professional development intervention introducing teachers to an active learning framework**.

In the first series of lesson presentations I observed the Grade 4 teacher and she in turn observed me in my Grade 1 class. The other two teachers' lessons were observed by me a week later. During the observation process I collected learners' work to see how the learners responded to the activities by means of group testing. The data collected using these methods were analysed to respond to the third goal of the study which was **to investigate how emergent active learning processes relate to education quality**. Detail of the different data generation methods used in the two phases is presented below.

3.3.1 Semi-structured interviews

Three teachers participated in semi-structured interviews in the beginning of the research process. The questions were prepared in advance to guide the interview process. As stated by Horn: "... in less structured interviews more periods of interaction occur that are not centred on the predetermined questions" (2009, p. 126). Semi-structured interviews allowed probing for information while also ensuring that the interviews were not moving away from the point of discussion. The purpose of the interviews was to gain insight into the teaching methods and strategies teachers used to teach environmental topics. Each interview was audio-recorded and transcribed (Appendix A: Example of a transcribed and coded interview).

3.3.2 Focus-group discussions

After the semi-structured interviews were conducted and transcribed, I conducted a focus-group discussion to give feedback to the teachers about the interviews and also to give my views on the interview questions because of my role as an active participant in the research process. Additionally the discussion was used for a member-checking process of the semi-structured interviews. It was also audio-recorded and transcribed (Appendix B: Coded transcript of Focus Group Discussion 1). After this I introduced the active learning framework to the teachers in a workshop where I took them through a step-by-step process of what it entails and how it works as a lesson planning tool.

After implementation, a second focus-group discussion was conducted to get feedback on the active learning framework as a lesson planning tool as well as the implementation of the lesson plans. The lesson implementations were based on the following topics: Nutrition (Grade 1), Water (Grade 2), Traffic Safety (Grade 3) and Waste Management (Grade 4). The questions for this session were prepared in advance. The data were also audio-recorded and transcribed (Appendix C: Coded transcript of Focus Group Discussion 2). In this discussion, Teacher 3 and I (as participant-researcher) decided that she ought to present another topic that included the biophysical dimension of the environment and not the social dimension only.

After she presented the topic of waste management I did a semi-structured interview with her to get her reflection on the presentation of the topic as a whole, based on the active learning framework (Appendix D: Coded transcript of Individual Interview 2 – Teacher 3). The data were integrated with the presentation of the data that emerged from Focus-group Discussion 2.

3.3.3 Document analysis: Teachers' lesson plans, associated activities and the Environmental Studies Curriculum

Bell argues that “most educational projects will require the analysis of documentary evidence” (1993, p. 67). In this research teachers' lesson plans were analysed of the topics presented. This was done to get a sense of what the teachers planned to teach and also to assist them in developing lesson plans using the active learning framework. In addition the *Environmental Studies Curriculum* (Appendix L) was also used to choose the relevant environmental topics, basic competencies and objectives from.

3.3.4 Classroom observations

Walker states that “one method increasingly used is to tape-record or videotape lessons in order to provide the basis for extending or elaborating ‘natural’ observation” (1990, p. 139). In this research lesson observations were audio-recorded and transcribed. For this process no observation schedule was used. I made notes and took as many photos as possible in addition to the audio-recordings. The notes and photographs were used together with the transcriptions in developing mini-case stories (Section 3.5.2, Appendix G). I did the first lesson observations with Teacher 4 and she in turn observed me. However, after the first two lessons Teacher 4 could no longer observe me and I observed my own lessons by taking as many photos as possible and writing down important things that I observed. Together with the audio-recordings this was sufficient for writing the mini-case story for the topic I presented (Section 3.5.2).

The other two teachers, Teacher 2 and 3 were observed by me. Twenty periods in total were used to observe the topics that were planned and presented for this study. I used seven periods, Teachers 2 and 3 used four periods each and Teacher 4 used five periods in total. The observations provided evidence of how the planned activities were presented and received.

3.3.5 Standardised testing: Learners’ work

Welman, Kruger and Mitchell state that “a standardised test is a collection of tasks in which: the content, the administration (giving the instructions and so on), the scoring of the obtained responses are the same, irrespective of who is administering it, to whom it is administered, and by whom it is scored” (2005, p. 155). Learners’ work provided insight into what the learners learnt according to the content of the lesson and the scores obtained by learners during the activities done by them. Welman, Kruger and Mitchell furthermore accentuate that “standardised tests can take on a variety of forms”, for example, “individual tests may only be administered individually, in other words, a test administrator can administer it to only one testee at a time”, on the other hand, “group tests may be administered to more than one individual simultaneously in one session” (ibid, 2005, p. 155). They also mention that “standardised tests can furthermore be divided into paper-and-pencil measurements/tests and apparatus measurements” (ibid, 2005, p. 155). In this research project the activities done by learners are referred to as paper-and-pencil measurements. From each topic presented I took ten examples of the formative structured activities and all of the summative structured activities

that were done by the learners. The summative assessment activities are displayed as assessment summaries in Appendix E: Assessment results Grades 1-3). Consequently, this was not possible in the case of the Grade 4's as the teacher did not do a summative assessment activity with them.

3.4 DATA ORGANISATION

Data organisation is a process whereby data sources are arranged in a more orderly manner. This process provides the researcher with a clear guide on what type of data source he should analyse first. Arranging the data sources enables the researcher to manage the body of data. I arranged the data according to the time it occurred during the research process. An inventory (Table 3.1) helped to sharpen the focus on the purpose of each type of data collected.

Table 3.1: Inventory of data sources

Research case	Data source	Purpose of data source	Dates conducted	Recording method
1	Semi-structured interviews with 3 teachers	To establish teachers' experience with different teaching methods and strategies	March 2012	Audio-recorded and transcribed
2	Focus-group discussion 1 (with the 3 teachers who took part in the study and myself)	Used for teachers to discuss the semi-structured interviews and to enable me to also share my views on the semi-structured interview questions	March 2012	Audio-recorded and transcribed
3	Document analysis of 4 lesson plans	Used to explore the lessons that were presented by the teachers and for writing mini case stories	April 2012	Teachers recorded own lesson plans
4	Lesson observations of all lessons of all teachers	To observe teachers' implementation of the active learning framework. The data were used for writing mini-case stories.	April - August 2012	Audio-recorded and transcribed and photographs

Research case	Data source	Purpose of data source	Dates conducted	Recording method
5	Standardised tests-group testing: Learners' formative work	To examine learners' engagement with the presentation of the whole topic	September 2012	Photographs of learners' work
6	Standardised tests-group testing: Learners' summative work	This was used to assess what knowledge the learners acquired and the learners' use of knowledge.	September 2012	Photographs of learners' work
7	Focus-group discussion 2 (with all 4 teachers)	Teachers' experience with the active learning framework and its implementation	September 2012	Audio-recorded and transcribed
8	Interview 2: Teacher 3	Individual interview with Teacher 3 to get her views on her experience with the active learning framework (after reworking her intervention)	September 2012	Audio-recorded and transcribed

Data were also allocated according to codes for easy identification of the different data sources (Table 3.2 below).

Table 3.2 Data index, showing codes used to differentiate data sources.

Source number	Index	Index Code
1	Teacher interview 1	TI, 1
2	Teacher interview 2	TI, 2
3	Teacher interview 3	TI, 3
4	Focus-group discussion 1	FGD, 1
5	Workshop: Active learning framework	WALF
6	Min-case story 1	MCS, 1
7	Mini-case story 2	MCS, 2
8	Mini-case story 3	MCS, 3
9	Mini-case story 4	MCS, 4
10	Learners' Formative Work Teacher 1	LFWT, 1
11	Learners' Formative Work Teacher 2	LFWT, 2
12	Learners' Formative Work Teacher 3	LFWT, 3
13	Learners' Formative Work Teacher 4	LFWT, 4

Source number	Index	Index Code
14	Learners' Summative Work Teacher 1	LSWT1
15	Learners' Summative Work Teacher 2	LSWT2
16	Learners' Summative Work Teacher 3	LSWT3
17	Focus-group discussion 2	FGD2
18	Interview 2: Teacher 3	I2T3

3.5 DATA ANALYSIS

The process of analysis is a method whereby the researcher considers what needs to be done with the collected data and how they will be processed. I made use of a qualitative approach to analyse the majority of the raw data through a process of uncovering and discovering themes that ran through the data and to interpret the implications of those themes for the research question. As stated by Welman, Kruger and Mitchell: "... themes can be described as 'umbrella' constructs which are usually identified by the researcher before, after, and during the data collection" (2005, p. 211). Quantitative analysis was also used for the learners' work in order to determine how they performed in the written activities that they were asked to complete at the end of each presentation.

Danemark, Ekstrom, Jakobssen, and Karlsson (2002) explain that data analysis can be deductive, inductive or abductive. They refer to deduction as a process "to derive logically valid conclusions from given premises and to derive knowledge of individual phenomena from universal laws" (ibid, 2002). They note that induction starts "from a number of observations to draw universally valid conclusions about a whole population to see similarities in a number of observations" (ibid, 2002). Abduction is "to interpret and recontextualised individual phenomena within a conceptual framework or a set of ideas, to be able to understand something in a new way by observing and interpreting this something in a new conceptual framework" (ibid, 2002). For this research process I used the inductive and abductive approach to analyse the data.

During these analyses analytical memos were created in the form of tables to sequence the data in a meaningful pattern. These are discussed and elaborated on below. I reduced the data by drawing only on relevant data that addressed the goals and the research question. The analytical memos served as a framework to present the data in Chapter 4.

3.5.1 Phase 1 – Analytical memo 1: Baseline analysis

In Phase 1 of the analysis, Analytical Memo 1 was developed from Teacher Interviews 1-3 and Focus-group Discussion 1. This memo responded to the first goal of the study.

Interviews 1-3 and Focus-group Discussion 1 were analysed in one analytical memo (Appendix F: Analytical Memo 1). The analysis was done searching for categories that would give me an understanding of what had been (prior to the research process) teachers' experience with different teaching methods and strategies in teaching environmental topics. (See Appendix A for an example of how transcriptions were coded). The categories that emerged from the analysed data informed the intervention guided by the active learning framework as presented in Chapter 4. The information was analysed according to the following categories presented in Table 3.3 below:

Table 3.3 Category list – Phase 1 analysis

CATEGORIES AND SUB-CATEGORIES	CODE
Category 1: Environmental Studies Curriculum	
Sub-categories	
Curriculum importance	CI
Learners benefit from this subject	LBS
Approach to teaching and learning	ATL
Training received to implement subject	TIS
Category 2: Lesson Presentations/Methods and Strategies	
Sub-categories	
Lesson introduction	LI
Methods and strategies used to present content	MS
Methods and strategies that allow learners' active involvement	MSLAI
Lesson conclusion	LC
Category 3: Knowledge	
Sub-categories	
Learners' application of knowledge in everyday life	LAKE
Knowledge acquired helps learners' understanding of sustainability	KLUS

CATEGORIES AND SUB-CATEGORIES	CODE
Category 4: Difficulties	
Sub-categories	
Difficulties encountered during presentations	DEP
Why these difficulties were experienced	DE
How these difficulties could be overcome	DO

3.5.2 Phase 2 – Part 1: Post-intervention (Mini-case stories)

In Phase 2 (Part 1 and 2) of the analysis the second goal of the study was addressed, which was to describe and explore emergent active learning processes. In Phase 2 (Part 1) the data were analysed to develop mini-case stories (MCS) from the lesson plans, lesson presentations, learners' work and photos that were taken during the lesson presentations. The different categories that were used to analyse the data are presented in Table 3.4.

The second phase analysis of lesson plans, lesson observations and learners' work were done after the lessons were presented. Mini-case stories were written about these lesson presentations (Appendix G: Example of a mini-case story). The categories that were used for this data analysis process were based on the dimensions of the active learning framework and learners' formative and summative work as presented in Chapter 4. The categories are displayed in Table 3.4 below:

Table 3.4 Category List – Phase 2 (Part 1) analysis

CATEGORY	CODE
Focus area	FA
Background knowledge	BK
Information sharing and seeking	ISS
CATEGORY	CODE
Enquiry	EN
Reporting	REP
Finding solutions	FS
Action	ACT
Assessment	ASS

The analysis of assessment was done quantitatively and qualitatively. For the quantitative analysis I mainly looked at how the learners performed in the summative assessment activities. For the qualitative assessment activities the data were analysed to determine the quality of the worksheets and the outcomes of learners' performance.

- The quality of worksheets completed by learners
 - The planned lesson competencies
 - Verify whether the questions in the worksheets were in line with the content of the lesson

- Outcomes of learners performance on completion of worksheets
 - What learners found easy to answer
 - What the learners found most difficult to answer
 - Whether the learners were able to apply the content knowledge that was required during the lesson according to their context

3.5.3 Phase 2 – Part 2: Analytical Memo 2: Teachers' reflections on the use of the active learning framework

In Phase 2 (Part 2), Analytical Memo 2 was developed (Appendix H: Analytical Memo 2). This memo was constructed with data that emerged from the second focus-group discussion dealing with the teachers' reflections on the use of the active learning framework and Interview 2 of Teacher 3. The different categories that were used to assist in the analysis process are presented in Table 3.5.

For Phase 1 and 2 of the research inductive analysis was used. The following themes emerged from the analysis of the data:

- General views on active learning presentations
- Difficulties encountered during lesson planning
- Including all areas of the active learning framework in lesson presentations
- Ways to overcome difficulties or problems, and
- Competence in active learning.

The categories that emerged from this analysis are displayed in Table 3.5 below:

Table 3.5 Category List – Phase 2 (Part 2) analysis

CATEGORY AND SUB-CATEGORIES	CODE
CATEGORY 1	
Sub-categories	
General views on active learning presentations	VALP
Difficulties encountered during lesson planning	DELP
Including all areas of the active learning framework in lesson presentations	IALP
Ways to overcome difficulties or problems	WOD
Competence in active learning	CAL

3.5.4 Phase 3: Analysis of emergent active learning processes in relation to education quality

In Phase 3 of the analysis the third goal of the study was addressed. In this part of the research process the relationship between the active learning framework and the education quality indicators was explored as presented in Chapter 5 (Section 5.3). For this process abductive analysis was conducted for a review of the data analysed for phase 1 and 2 and used towards the construction of the discussion in Chapter 5 (Section 5.3). This means that the data were interpreted and re-contextualised. In this process, the analysed data from Analytical Memo 1 and 2 and the mini-case stories were interpreted and re-contextualised (Analytical Memo 3) using the education quality indicators of Nikel and Lowe (Section 2.7).

The indicators became the main categories of this analytical process (Appendix I: Analytical Memo 3). From the broad categories, sub-categories were used to draw on the individual interviews, focus-group discussions and the mini-case stories (that were written from the lesson plans, lesson observations and learners' work).

3.6 DATA GENERATION: CHALLENGES ENCOUNTERED

The use of the different data generation methods in this research study posed several challenges. These are discussed below:

As a Grade 1 class teacher I experienced difficulties to get time off from my working schedule. In order to get time off I first had to get a relief teacher who could take over my classes for the periods that I had to observe the lessons of the teachers who took part in the study. This was also the case with the teacher who had to observe me.

In order to observe the teachers' lessons I had to negotiate the most suitable time for these lesson observations with the teachers. Sometimes it meant that we had to reschedule the timetable to fit in the presentations.

Examination and tests in the school were also a problem as these held back the data-generation process. Sometimes the teachers did not inform me in advance that the learners were going to write a test series and I then needed to wait for at least a week before we could continue with the lesson observations.

Being an active participant in this study was difficult. As I had to get one of the teachers to observe me, I first had to orientate the teacher regarding my research interest to make sure she understood what she was supposed to look for. This worked for my first four lesson presentations, but for the rest the teacher observing me was not available any longer and I had to observe myself for the last three lessons. It was quite challenging to critically evaluate myself and to be as objective as possible in everything I did. This teacher also did not provide me with any feedback on the observations that she made in my classroom. I thus relied on feedback from the reflection focus-group discussion session and the audio-recordings that I transcribed after the lesson presentations.

I had a lot of data. Transcribing the raw data took up a lot of time. I also struggled at first to sequence the data that were generated in an orderly manner as the scope of the data was too large for me to handle. Only after arranging the data in a table format (Table 3.1) was I able to see the whole picture of all the data collected for this research project.

3.7 RESEARCH DESIGN SUMMARY

A research design summary of the research processes, data generation and analytical phases is displayed in Table 3.6 below:

Table 3.6 Summary of the research process

Research processes and data generation	Analytic phases	Research Goals
1.1 Personal interviews with teachers (qualitative analysis). 1.2 Focus-group discussion 1 with teachers (qualitative analysis).	Phase 1 Analysis: Inductive analysis was used for existing methods used by teachers (Responding to Goal 1)	Goal 1 (Chapter 1: Section 1.8)
2.1 Observations of teachers' presentations of lessons planned according to the active learning framework and document analysis of lesson plans (qualitative analysis). Document analysis of learners' work (quantitative analysis). 2.2 Reflections done by teachers based on lesson presentations (Focus-group discussion 2) (qualitative analysis).	Phase 2 (Part 1) Analysis: Description of emergent active learning processes Phase 2 (Part 2) Analysis: Further exploration of emergent active learning processes (Responding to Goal 2)	Goal 2 (Chapter 1: Section 1.8)
2.3 Exploring the relationship between emergent active learning processes and educational quality (qualitative analysis).	Phase 3 Analysis: Abductive analysis using the 7 education quality indicators by Nikel and Lowe (2010) (Responding to Goal 3)	Goal 3 (Chapter 1: Section 1.8)

3.8 RESEARCH VALIDITY, TRUSTWORTHINESS AND ETHICS

3.8.1 Validity and trustworthiness

Leedy and Ormrod argue that “validity is about accuracy, meaningfulness, and credibility of the research project as a whole” (2010, p. 97). In this research project triangulation was used across interviews, focus-group discussions, classroom observations and analysed documents in order to validate the data.

To reduce the data three analytical memos were developed. The first analytical memo was developed from the individual interviews and Focus-group Discussion 1. In this analytical memo individual interviews and Focus-group Discussion 1's data were triangulated. The second analytical memo was developed from the second focus-group discussion. The next data analysis step was done in the form of mini-case stories which emerged from triangulating the

classroom observations, photographs and the analysed documents. After this analytical process the two analytical memos together with the mini-case stories were triangulated in order to construct the third analytical memo that was developed for the discussion based on the education quality indicators of Nikel and Lowe (2010). Cohen, Manion and Morrison state that “triangulation techniques in the social sciences attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint” (2010, p. 141).

For this study, the data that were generated and analysed were guided by the research purpose, research questions and content. Maxwell (1992) states that validity is not only about what methods one uses, but that the data accounted for and conclusions made from those methods adhere to the purpose and context of the study. Table 3.6 illustrates how the 3 different analytic phases link to the three research goals, thus indicating validity in terms of the purpose of the study.

Lather (1986) describes face validity as an important validity criterion that is achieved through member checking. In the study this was achieved through member checking sessions during the first and second focus-group discussions. The participants checked data from the individual interviews during the first focus-group discussion. For the second focus-group discussion, the teachers were asked to read through the transcriptions and say whether they agreed that what was written in the transcripts was an accurate reflection of their contributions in these interviews.

Another factor that ensured the validity of the research is the fact that I was an active participant in the investigative intervention process in which I exposed myself for critique by fellow teachers just as they were exposed to my critique. As an active participant in this study I had to be self-reflexive (Lather, 1986) to strengthen research validity. This was achieved by observing myself when the teacher who was expected to observe me could no longer do so (Section 3.3.4).

I also ensured theoretical validity through consistent working with the theoretical framework of the study in relation to data, findings and explanations (Maxwell, 1992). This was particularly in analytic Phase 3 with the use of Nikel and Lowe’s education quality indicators.

My position and role as active participant and interest in the study has also been clarified as stated in the first part of this paragraph. A reflection on my role in the research can be found in the last part of this study (Chapter 6).

3.8.2 Research ethics

Ethics in research ensures that the participants are given fair treatment in the research process. According to Costley and Gibbs “the importance of the ethics of caring is, therefore, not just a mantle for individual researchers, but a rational and intellectual approach to the research process as a whole, where everyone involved in the research needs to recognise the ethic of care” (2006, p. 96).

Research participants should be free to carry out research activities without feeling obligated or forced into the research activities. To ensure this I first asked permission from the principal at the school where I am teaching to conduct the research at school using the children and the teachers (Appendix J: Letter of permission to the principal).

I also sent out consent letters to all the teachers in which I asked their permission to conduct interviews with them and to involve them in workshop focus-group sessions and to observe their lesson presentations and the work of learners who took part in the lesson presentations (Appendix K: Consent letter to teachers).

All participants were also informed that their participation was of their own free will and that they should not feel obligated into doing something with which they did not feel comfortable. The participants were also informed that their participation was voluntary and that they had the right to withdraw at any time in the study if they did not feel comfortable with what was being done in the research.

In order to offer the participants anonymity their names and the research site were not revealed (Bassey, 1995). Names were removed from any samples of learners’ work used and no photographs showing participants’ faces were used.

3.9 CONCLUSION

The focus of this chapter was to explain the research design and the methods used in generating the data for this study. The research methodology which was qualitative and quantitative in nature was decided upon to provide me with insight into the phenomena of how teachers and learners learn in their natural environment. The description of the phenomenon was conducted using a case study in order to retain the characteristics of real-life events. Four methods appropriate to qualitative case study research were described for the data generation that was desired for this study. The four methods were semi-structured interviews, focus-group discussions, classroom observations and document analysis. Standardised testing was used as a quantitative measure of learners' work. Each method was selected for the generation of a specific kind of data according to the stated goals of this study (Section 1.9.2).

Data analysis was described using two major modes of inference for data analysis, namely inductive and abductive modes. Analysing the data allowed me to make meaning of what I wanted to achieve as was stated in the goals of this study.

Data management allowed me to obtain a clear picture of what data should be analysed first. The data analysis process helped me to sharpen my focus on what data were needed to address the three goals of the study. Triangulation and member-checking were discussed in order to ensure the validity of the data and research process. Research ethics was warranted to ensure that all participants were treated with care, that they did not have to feel obligated to participate in the study and that they could withdraw from the study anytime they wanted to or felt uncomfortable with what was being done in the research process.

The data that were generated within this research design, namely the individual interviews, focus-group discussions, lesson observations and teacher reflections, are presented in the following chapter.

CHAPTER 4

Teachers' experience with the Environmental Studies Curriculum and their engagement with the active learning framework

4.1 INTRODUCTION

This chapter presents an analysis of the data that were generated through the research process. Section 4.2 presents Phase 1 of the analysis that is the teachers' experience with and understanding of existing methods and strategies used in the *Environmental Studies Curriculum* as a whole. This data addresses the first goal of the study, which was **'to investigate teachers' existing experience with different teaching methods and strategies in teaching Environmental Studies (prior to the intervention)'**. This first phase of data analysis was followed by Phase 2 Part 1 analysis, which was a description of active learning processes emerging from the intervention workshop. This analysis is presented in Section 4.3 of this chapter. This analysis relates to the second goal of the study which was **'to describe and explore active learning processes emerging from a teacher professional development intervention introducing teachers to an active learning framework'**. Phase 2 Part 2 of the analysis presented in Section 4.4 of this chapter. This process of analysis aimed at establishing the teachers' experience with the active learning framework. Analysis of this data also addresses the second goal of the study as stated above.

Data presented from the above analyses were re-contextualised in Chapter 5 in order to achieve the third goal of the study which was **'to investigate how emergent active learning processes relate to education quality'**.

4.2 TEACHERS' EXPERIENCE WITH THE ENVIRONMENTAL STUDIES CURRICULUM

The data were generated by interviewing teachers followed by a focus-group discussion as a member checking session and to give my feedback on the interview questions. The data were

aimed at describing the teachers' experience and understanding of the *Environmental Studies Curriculum* as a whole before intervening with the active learning framework.

4.2.1 Value of the *Environmental Studies Curriculum*

Each teacher had a different view of the importance of the *Environmental Studies Curriculum*. Their understanding of the *Environmental Studies Curriculum* was that: *Environmental Studies* is the main carrier subject and that a topic should be taken from *Environmental Studies* and be integrated into the rest of the subjects (IT1, p. 1); it is part of the curriculum and we have it as a subject in class and learners are assessed in this subject as well (IT2, p. 1); it provides them with a broader picture of a healthy lifestyle and with more knowledge about what is going on around them (IT3, p. 1); and it gives them a broader picture of what is going on in their environment and how they can help themselves with the natural resources they have and what they should do with it (FG1AP, p. 2).

On the question of how learners might benefit from the subject, the teachers had the following to say. They explained that the learners will benefit a lot from this subject because it includes the environment, it can broaden their general knowledge, and by getting information and being made aware of their environment they can benefit (IT1, p. 2; IT2, p. 1; IT3, p. 3; FG1AP, p. 3).

4.2.2 Training received

This information was generated to get a broader view of what training the teachers received for *Environmental Studies* and if they felt suitably knowledgeable after the training.

Three teachers said that they did not get much training in this subject and that the training they received was not sufficient for them to implement the subject effectively (IT1, p.2-3, IT2, p. 2, IT3, p. 3, FG1AP, p. 4). The Grade 4 teacher did not get training in this subject. She was not qualified for the Lower Primary Phase (Grade 1-4) but was appointed in this position because of a shortage of teachers.

4.2.3 Methods and strategies

Information was generated about the use of methods and strategies used by teachers in order to consider how these might support active learning processes.

Two of the teachers used the approach prescribed by the curriculum. Teacher 1 said that there is an approach prescribed by the curriculum but did not elaborate on it (IT1, p. 2). Teacher 2 and Teacher 4 said that the approach that needs to be followed is the approach prescribed by the curriculum, namely the learner-centred approach (IT2, p. 1-2; FG1AP, p. 3). Teacher 3 said that there is no prescribed approach (IT3, p. 3).

In the introduction section of their lessons the teachers mostly ask questions or use rhymes, songs or role plays. Teacher 1 replied that she mainly starts her lessons by using a rhyme, song or a role play (IT1, p. 3). Teacher 2, 3 and 4 replied that they usually ask the learners questions to see what their understanding of the topic is (IT2, p. 3; IT3, p. 3; FG1AP, p. 4).

Teacher 1 and 2 explained that they usually ask the learners questions in order to present new subject content; whereas Teacher 3 said that she usually discusses the topic with the learners first to determine their existing knowledge and thereafter she discusses the content that they do not know yet (IT1, p. 3-4; IT2, p. 3; IT3, p. 4). Teacher 4 explained that with Grade 1 you should just take the lead all the time (FG1AP, p. 5).

Teacher 1, 2 and 3 said that the methods and strategies that they use allow learners to be actively involved in the teaching and learning process (IT1, p. 5; IT2, p. 4; IT3, p. 5) although they did not elaborate on these methods. Teacher 4 was not so sure if the learners learnt anything through active involvement (FG1AP, p. 9). Hence, not one of the four teachers revealed in what ways learners were actively involved.

The teachers explained that they conclude their lessons by asking the learners questions, followed by written activities, worksheets or tasks. Teacher 1, 2, 3 and 4 said that they ask the learners questions to test their understanding of the topic, which is then followed up with a written activity, worksheet or task (IT1, p. 5; IT2, p. 4; IT3, p. 5; FG1AP, p. 9).

4.2.4 Knowledge

All four teachers stated that the learners should be able to apply the knowledge that they learn in their everyday lives (IT1, p. 5-6; IT2, p. 5; IT3, p. 6-7; FG1AP, p. 10) although they did not

elaborate. Teacher 4 also stated that if the learners are not familiar with the content knowledge, they would not be able to apply it in their everyday lives (FGAP, p. 10).

The teachers' response to the question of whether knowledge acquired in *Environmental Studies* helps learners' understanding of sustainability was: most of the topics teach them how to, for example, sustain water and to keep themselves clean (IT1, p. 6). She explained that they teach learners the importance of what we have in the environment and that we should sustain it so that we can use it in the future and tomorrow. It is not that we use something today and forget about it; we have to keep it for later use for ourselves and for the next generation (IT2, p. 5). One teacher expressed doubt over her learners' ability to understand the notion of sustainability, as there are those who really struggle to sustain, but they try their best every day (IT3, p. 8).

The teachers felt that when using the usual teaching methods (which are mostly teacher-centred) the learners enjoy the *Environmental Studies* lessons. Teacher 3 stated that sometimes the learners seem to be really interested (IT1, p. 7 & IT2, p. 5; IT3, p. 7-8).

4.2.5 Difficulties

A difficulty all four teachers encounter during lesson presentations is limited time (IT1, p. 7-8; IT2, p. 5-6; FG1AP, p. 12). Teacher 2 has discipline problems (IT2, p. 5-6), and she thinks it is because the subject is so enjoyable that it causes learners to become disruptive, which, in turn, causes discipline problems. She furthermore stated that more time should be given to this subject, for instance in the afternoons (IT2, p. 7). Teacher 3 has difficulties with not knowing what teaching aids to use (IT3, p. 9) maybe because she did not receive any training, and to overcome this she must just plan in advance (IT3, p. 10). Teacher 4 has difficulties with lack of methods and subject content (FG1AP, p12).

Next the teachers' engagement with the active learning framework is presented.

4.3 TEACHERS' ENGAGEMENT WITH THE ACTIVE LEARNING FRAMEWORK

This section presents the teachers' planning and implementation of lessons structured using the active learning framework. These lessons were planned during and following the dimensions of

the active learning framework during the research intervention. This information is summarised from the mini-case stories that were introduced in Section 3.5.2. The mini-case stories were constructed from the lesson plans, the lesson observation transcripts, photos taken during the lesson observations and the learners' work. Extracts of the mini-case stories are presented below, each under the following headings, context, syllabus links, area of focus, information, body of lessons, highlighting the four dimensions of the active learning, and lesson conclusions. Plates are included at the end of each topic presentation to serve as evidence of what happened during the lessons. Furthermore, following each (case study) are qualitative and quantitative analyses of formative and summative assessments respectively. The data were generated to inform the second goal of the study which was **to describe and explore active learning processes emerging from a teacher professional development intervention introducing teachers to an active learning framework**.

Detail from the mini-case stories is presented below in order from Grade 1 to Grade 4. The Grade 1 teacher (myself as active participant) presented the topic 'Nutrition', the Grade 2 teacher presented the topic 'Water', the Grade 3 teacher presented 'Traffic Safety' and the Grade 4 teacher presented 'Waste Management'.

The learners referred to in these mini-case stories are multi-cultural and the language of teaching and learning is English. Although the medium of instruction is English, English to most of these learners is a second or sometimes a third language.

4.3.1 Planning and implementation of the active learning framework:

Grade 1 (Teacher 4: Active Participant)

Context of the case

The learners in the Grade 1 class of 40 learners were 6-8 years old, and the majority turned 7 during the year. As researcher and active participant of the study I presented these lessons as I am the teacher of this particular Grade 1 class group. I am a qualified Lower Primary teacher and achieved my qualification at the Windhoek College of Education, currently called the University of Namibia, Khomasdal Campus. In addition I also completed my Bachelors in Education with an Honours degree at Rhodes University.

The presentation that follows was extracted from mini-case story 1 (MCS1) (See Appendix: G).

Syllabus links

The following information links to what is stipulated in the *Environmental Studies Curriculum* for Grade 1 (See Appendix: L) and the *Environmental Learning Curriculum Guidelines for Educators* (Namibia. MBEC, 2005b, p. 15) that were used as an aid to assist with the planning of the topics presented for this study.

Theme: Health, Safety and Nutrition

Topic: Nutrition

Sub-topic: Healthy/unhealthy food

Most of the objectives that were selected for this topic came from the *Environmental Learning Curriculum Guidelines for Educators*, as this document was designed as a guide to assist with the teaching and learning of environmental learning in the different Namibian curriculum subjects. These objectives were selected as they give more insight into the way *Environmental Studies* can be addressed than the one objective that is stated in the *Environmental Studies Curriculum*. The stated objectives that were selected from the *Environmental Learning Curriculum Guidelines for Educators* for this topic were as follows:

- Understand better how livelihoods are dependent on the environment
- Collect, classify, analyse and interpret data
- Organise, plan, implement and monitor an environmental project
- Encourage a sense of personal and social responsibility and a desire to work cooperatively with others on an environmental issue

These objectives were used for formative assessment for the activities that were used during the presentation of this topic.

The objective as stated in the *Environmental Studies Curriculum* was as follows:

- Understand which food and eating habits are necessary for their growth and health.

This objective was directed at the final outcome of the topic which was assessed in the form of summative activities.

The basic competency as stated in the *Environmental Studies Curriculum* was as follows:

- Explain healthy food that should be eaten regularly, and healthy eating habits.

The basic competency was used to determine whether the learners had mastered the knowledge, skills and attitudes regarding healthy food and to practise healthy eating habits.

Area of focus

Weak eyesight and rotten teeth were detected by nurses at the beginning of the year (2012) during the yearly Grade 1 health examination. With this concern taken into consideration, I taught the learners how much food is consumed by humans, the importance of healthy food, and what food types are necessary for a healthy body with the emphasis on eyes and teeth.

Introduction of the topic

The topic was taught over seven periods of forty minutes each.

To introduce the lesson I asked learners what they do when they are hungry and thirsty and they replied that they eat and drink. I asked them more questions about what food they like and what they like to drink. They replied that they like to eat eggs, rice, spaghetti, macaroni, salad, pudding, corn flakes, ice-cream, custard and chocolate and that they like to drink cool drink, Oros, tea, juice, yoghurt, Coke and water. I asked them where we get these drinks and food from. They replied from plants. Then I asked them what we also get from plants and the learners replied bread, vegetables, apples, carrots, oranges, pears and bananas. I asked them what they eat in the mornings, and what they have for lunch and supper. The learners replied that in the mornings they eat bread and tea, porridge and biscuits and for supper they have rice, soup and meat.

Body of the lessons

➤ Information sharing and seeking

I started the lesson by showing the learners a poster with different food types (Plate 1: Photograph 1). I pointed to all the different pictures and the learners could identify them. I read the food names on the poster and asked them to repeat it after me. This was done after the learners had identified the food names on the poster.

I continued asking the learners more questions as follows:

Nicola: *Now all the food we get from what? Who can still remember?* Learner: *Trees.* Nicola: *Plants. Where do we get the meat from?* Learner: *From the animals.* Nicola: *So we get food*

from plants and animals. Now what will happen if there are no plants and animals? What will happen?

Learner: *You will feel hungry.*

Next learner: *You must put seeds in the ground for the food to grow.* Nicola: *Yes, she said we must put seeds in the ground for the food to grow. Yes, that is right, but how will we help the plants to grow?*

All learners shouted: *Water.*

The information as stated above addresses the objective that came from the *Environmental Learning Curriculum Guidelines for Educators* which was: Understand better how livelihoods are dependent on the environment.

I went on and taught them a rhyme about the production of bread. This was done to demonstrate how food is produced from plants (Plate 1: Photograph 2). I explained some of the words to the learners as follows.

Nicola: *Now grain is a type of plant that we get. They work it so that it can become fine so that we can make bread with it. So it first comes from the seed. Then it becomes a plant that is called a grain. Then they like crush it. They make it fine so that they can make bread out of it.*

The learners and I recited the rhyme several times.

Thereafter I gave them a sheet of paper with pictures of healthy and unhealthy food (Plate 1: Photograph 3). The learners were asked to colour the pictures of only those foods that they liked. This was done to determine what food types the learners like to eat and if what they eat is healthy or unhealthy according to the pictures of the food that they chose to colour.

➤ Enquiry and reporting back

The next lesson was an enquiry. The enquiry was based on a questionnaire of what learners eat daily (Plate 2: Photograph 4). The learners were asked to complete the questionnaire with the help of their parents. This was given a few days in advance to prepare for a presentation during a lesson in class. I called the learners to the front one by one to present their answers to the rest of the class. I did this with ten learners of whom only three could do it perfectly, while the other seven could not present the results captured in the questionnaire (this might have been because the learners were only three months in school at this time data were generated and struggled to

read the information themselves). This took a whole period of forty minutes as well as time during the following English lesson.

I then recorded the information in another way. I wrote the questions of the questionnaire on the chalkboard in table form with all the different food types that might be eaten under it. With this approach the learners were able to put up their hands as an indication of what they usually eat as displayed on the chalkboard. This was done to save time because the individual feedback of the questionnaires was too time consuming.

I then recorded the information as stated above. This was done until everybody's information on the paper was collected by writing it in the table on the chalkboard. This information was then recorded on a graph in order to save time.

I then went into a discussion of the graph that showed how many food types the learners eat and how many of them eat the specific food type. The learners then named all the food types that were on the graph and that were on the board the previous day. We all looked at the graph to see how many different food types were consumed by them. Some of the foods were consumed more than others. We discussed this as we were looking at the graph (Plate 3: Photograph 5). The information as stated above addresses the second objective that was taken from the *Environmental Learning Curriculum Guidelines for Educators*, namely collect, classify, analyse and interpret data. The learners collected the information and I classified it by portraying the information on a graph. The information on the graph was analysed and interpreted by both the teacher and the learners by looking at what foods are liked most and what foods are liked least. This was done to show the learners whether they eat more healthy food than unhealthy food or vice versa.

After we discussed the graph I put up another poster (Plate 3: Photograph 6). I used this poster to teach the learners why we need to eat different food types and what food types are good for our bodies and what food types are not. I asked them several questions and, through prompting, they identified the reasons for eating healthy food as to grow, stay alive and be healthy and strong. They also identified the role of fruit and vegetables as protecting us from getting sick.

I then told the learners that the graph shows that only fourteen learners out of the class group of forty eat fruit and vegetables and that is why they always cough and have running noses I pointed to the picture of fruit and vegetables). I then taught them another rhyme (Plate 3: Photograph 7). The information as presented above addresses the objective that came from the

Environmental Studies Curriculum, namely: Understand what food and eating habits are necessary for their growth and health.

➤ Finding solutions

Thereafter I told the learners about the yearly health examination that was done by the nurses. I also told them that the nurses found that many of the Grade 1 learners have weak eyesight and rotten teeth. I then did a rhyme with them to guide them on what foods are good for weak eyesight and rotten teeth (Plate 3: Photograph 8). Thereafter I asked them to complete a worksheet on which they had to connect a rotten tooth with a sweet and an apple with a healthy tooth (Plate 3: Photograph 9).

I then asked the learners questions about the rhyme which played out as follows:

Nicola: *Now what does the rhyme tell us, what must we eat for your teeth to be protected?*

Learners: *Apples and bread.*

Nicola: *And for our eyes?*

Learners: *Carrots.*

I went into further discussion with the learners on this topic. I asked them what we can do at school to always have fruit and vegetables. One learner said that we can plant seeds. I agreed. Thereafter I asked them if they have seen a vegetable garden at the school. In reply to this question the learners said no. I then told them that there is a vegetable garden and asked them to go and look during break time what was growing in the garden. The learners came back and reported that there were only mealies in the garden.

Thereafter I brought some carrot seeds to school to show to the learners. I asked them what we are going to do with the seeds and the learners replied that we should plant them. The information as presented above addresses the fourth objective that was taken from the *Environmental Learning Curriculum Guidelines for Educators*, namely: Encourage a sense of personal and social responsibility and a desire to work cooperatively with others on an environmental issue.

➤ Action taking

In the next part of the lesson the Agriculture teacher taught them how to plant carrot seeds. He told them that you can plant carrot seeds during winter or summer. He also said that when the soil is good the seeds will germinate after seven days but if it is very cold it will take a bit

longer, roundabout fourteen days. He then showed the learners a carrot seed packet. He explained that when you plant carrot seeds you need to make a hole with your finger that is as deep as the length of your index finger. He explained how to take a few carrot seeds and put them in the hole and cover them with sand. Then he demonstrated how to space carrot seeds (Plate 3: Photograph 10 & Photograph 11). Finally he explained that you should continue with this until the whole row is planted with carrot seeds.

The Agriculture teacher asked if there was anyone of the learners who would like to volunteer to plant the carrot seeds as he had demonstrated to them. One learner went to demonstrate and he got it right (Plate 4: Photograph 12). This made the rest of the learners all eager to also sow seeds. While the learners were doing this the teacher assisted them (Plate 4: Photograph 13) by saying that they should check what their friend is doing. He also handed the seeds to the learners and said that they must look carefully where the hole is made and then place the seeds very carefully into the hole to prevent the seeds from falling outside the hole. The Agriculture teacher asked another learner to come and measure from where the previous learner had planted the seeds. The learner demonstrated how to sow the seeds and the teacher once again assisted him. He did this until all holes that were made had seeds in. The information as presented above is relevant to the third objective that was taken from the *Environmental Learning Curriculum Guidelines for Educators*, namely: Organise, plan, implement and monitor an environmental project.

Conclusion

The last lesson of the topic presented to the learners was revision of the whole topic and giving the learners the opportunity to reflect back on everything that they had learnt.

➤ Reflection on the whole lesson

I started off this section of the topic by asking the learners questions about all the work that had been done. This was done so that the learners could reflect back on the presentations done for the entire topic. I asked them what would happen if there was no food in the world and one learner answered we will die. I asked what we can do to make sure that we have food all the time and another learner answered we can plant. Then I asked them if we planted and what we planted. The learners replied, yes we planted carrot seeds. Thereafter I asked them if the seeds grew and the learners said yes the seeds grew into small plants. The learners knew this because

they were asked to monitor when the seeds were germinating. It took three weeks for the seeds to germinate as it was still very cold for germination.

Nicola: *Now how did you feel the day that you have planted the seeds?*

Learners: *Nice.* Nicola: *Is it. Did you feel good about it?*

Learners: *Yes.*

Nicola: *Will you do it again.*

Learners: *Yes.*

However, during that December holidays the young carrot plants died. The seeds did not get water during the holidays as the teacher responsible for the garden depended on the seasonal rains to water the plants and the expected seasonal rains did not come. This left the learners very disappointed as they really looked forward to harvesting the crops and eating the carrots.

I asked the learners to complete two worksheets on the work they had done on this topic (Plate 5: Photographs 14 and 15). I explained one by one how the learners should answer the questions. The information as presented above is relevant to the basic competency that was taken from the *Environmental Studies Curriculum*, namely: Explain what healthy food is that is eaten regularly, and healthy eating habits.

Analysis of learners' work is presented below:

➤ Qualitative analysis of worksheets

- Planned lesson competency

Analysis of whether the stated competency was met revealed that the worksheets were designed according to the required basic competency, which was to maintain a healthy/unhealthy diet and which foods are healthy and which foods are unhealthy for our bodies (LSWT4).

- Whether the questions in the worksheets were in line with the content of the lesson

The questions in the worksheets were in line with the content of the lesson as Worksheet 1 concentrated on healthy and unhealthy foods and the questions in Worksheet 2 concentrated on what we can do to provide food for ourselves. This related to the competency on how to plant seeds and care for and monitor the growth of the planted seeds (LSWT4).

- What learners found easy to answer

In the first worksheet the learners found Question 6 the easiest to answer. This question was: Carrots can give you weak eyesight/good eyesight. The learners had to circle the correct one of the two answers that were provided (the underlined parts in the sentence). Only one learner could not answer this question correctly. In the second worksheet the learners found Question 1 the easiest to answer. This question was: To plant seeds you first have to ____ (answer: dig) a hole. The learners had to choose from five words to complete this sentence correctly, which was in this case the word 'dig'. Only two learners could not answer this question correctly (LSWT4).

- What the learners found most difficult to answer

In the first worksheet the learners found Question 1 the most difficult to answer. This question was: We need to maintain a healthy/unhealthy diet. In this worksheet five learners could not answer this question correctly while the rest of the learners answered it correctly. In the second worksheet the learners found Question 6 the most difficult to answer. This question was: What do we need to do in order to always have food? In this worksheet 17 learners could not answer this question correctly (LSWT4). At the time that work was done the learners had only been in school four months and were still learning to read and write the language.

- Whether the learners were able to apply the content knowledge that was required during the lesson according to their context

The answer to this question was: Plant seeds. This information they practised during the lesson when they planted the carrot seeds (LSWT4).

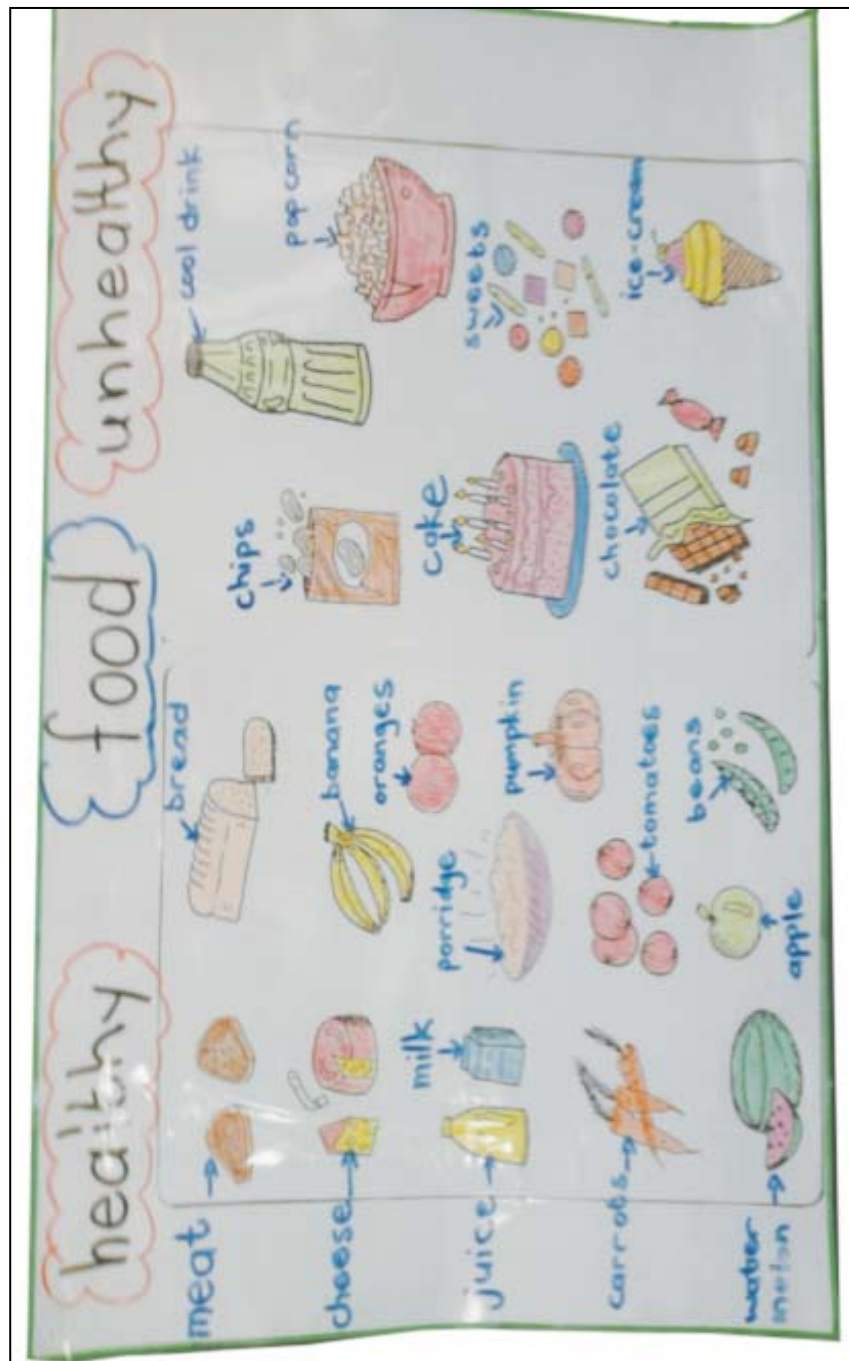
➤ Quantitative analysis of worksheets

The outcomes of the worksheets were measured according to the results the learners obtained. Of the 40 learners 37 completed this worksheet (Appendix F: Summative assessment: Worksheet 1) (Three learners were absent). In Worksheet 1 two of the learners scored between 50% and 80%, whereas 34 of the learners scored more than 80% and one learner got under 50%. The outcome of the results of Worksheet 1 can be found in Appendix F: Summary of Grade 1 – Assessment results Worksheet 1.

Of the 40 learners, 39 learners took part in the second worksheet (one learner was absent) (Appendix F: Summative assessment: Worksheet 2). In this worksheet two learners scored less than 50% and 12 learners scored between 50% and 80%, whereas 25 learners scored more than 80%. The outcome of the results of Worksheet 2 can be found in Appendix F: Summary of Grade 1 – Assessment results Worksheet 2.

GRADE 1: PLATES 1 - 5

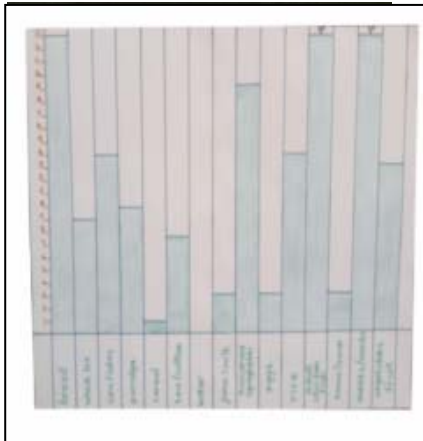
PLATE 1



Photograph 1: Poster of food that was used in the lesson of healthy and unhealthy food types.



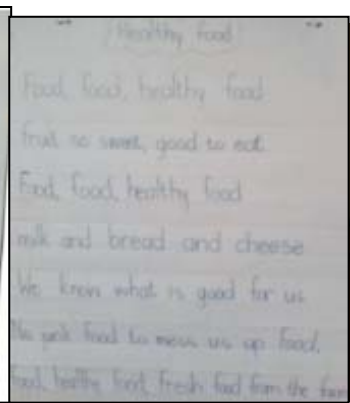
PLATE 3



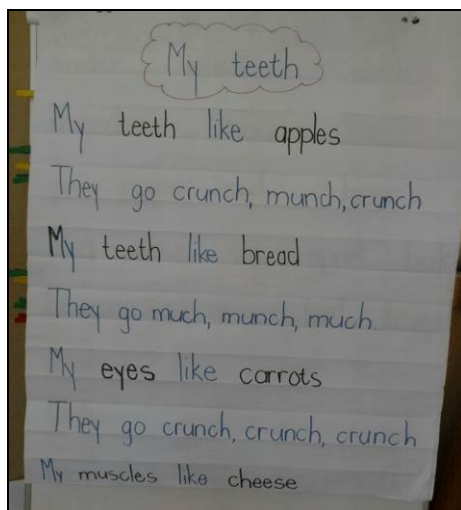
Photograph 5: Graph of what learners eat daily.



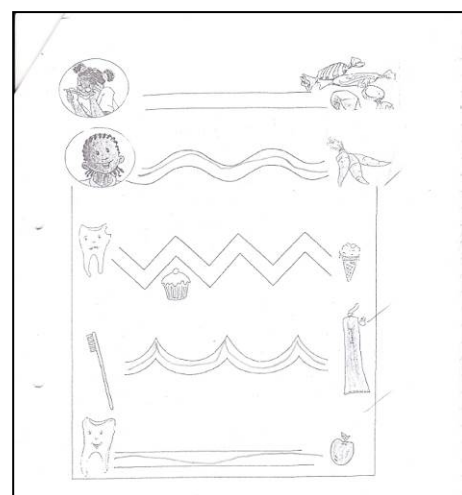
Photograph 6: Poster of healthy food types.



Photograph 7: Rhyme of 'Healthy food'.



Photograph 8: Rhyme of 'My teeth'.



Photograph 9: Worksheet done by learners on healthy and unhealthy food types.



Photograph 10: The Agriculture teacher demonstrating how deep the holes should be to plant the carrot seeds.



Photograph 11: The Agriculture teacher demonstrating how far apart the holes should be to plant the carrot seeds.

PLATE 4



Photograph 12: One learner who was eager enough to come plant the carrot seeds.



Photograph 13: The Agriculture teacher assisting learners with planting the carrot seeds.

PLATE 5

Worksheet: Nutrition – Healthy and unhealthy food

1. We need to maintain a healthy / unhealthy diet.
2. Milk and cheese build a strong body / weak body.
3. Porridge and cereal give you energy / makes you sleepy.
4. Fruit and vegetables keep you healthy / sick.
5. Apples make your teeth rotten / strong and white.
6. Carrots give you weak eye sight / good eye sight.

Photograph 14: Worksheet done by learners on healthy and unhealthy food types.

2. Complete the following sentences by choosing the correct word.

germinate dig water finger seeds

- 2.1 To plant a seed you first have to dig a hole.
- 2.2 The hole must be as deep as the length of your finger.
- 2.3 Put in two to three seeds to make sure that it will germinate.
- 2.4 It usually takes 1-2 weeks for a seed to germinate.
- 2.5 Seeds need to get enough water in order to grow.

3. What do we need to do in order to always have food?

We must plant seeds.

Photograph 15: Worksheet done by learners on how to plant seeds.

4.3.2 Implementation of the active learning framework: Grade 2 (Teacher 1)

Context of case

This lesson was presented to the Grade 2 learners. The age of these learners was between 7 and 9 years, and the majority of the class was 8 years old. This class group consisted of 40 learners. The Grade 2 teacher is a qualified Lower Primary teacher who received her qualification through the Windhoek College of Education, currently called the University of Namibia, Khomasdal Campus.

The presentation that follows was extracted from mini-case story 2 (MCS2).

Syllabus links

The information presented below was extracted from the teacher's lesson plan with reference to the *Environmental Studies Curriculum* for Grade 2 (See Appendix: L).

Theme: The Natural Environment

Topic: Environmental Care

Sub-topic: Water – The most important resource

The objectives presented in the lesson plan as stated below were selected from the *Environmental Studies Curriculum*:

- Understand the importance of conserving water as part of the ecocycle
- Learners should know why water must be used sparingly, what happens if it is not, and where water can be stored in the home

These objectives were used for formative assessment of the activities that were used during the presentation of this topic.

The basic competency as stated in the *Environmental Studies Curriculum* is as follows:

- Explain how and why water can be saved and stored

The basic competency was used to determine whether the learners have mastered the knowledge, skills and attitudes of how and why water can be saved and stored.

Area of focus

The main focus of this lesson was to teach the learners why and how to save water.

Introduction of topic

The topic was taught over four periods of forty minutes each.

The teacher introduced the lesson by telling the learners a story to stimulate their prior knowledge of the topic. The title was '*Dorothy raindrop*' (Plate 6: Photograph 17). She asked the learners questions about the story which they answered as follows:

Teacher: *Now this story is about Dorothy. Now who can tell me who this Dorothy is?* Learner: *She is a rain drop.*

Teacher: *Okay so Dorothy is a rain drop and how did Dorothy feel when she was in the sky?*

Learner: *She was very scared to fall down.*

Teacher: *Yes, she was very scared to fall down because she didn't know what will happen to her when she falls down, isn't it?*

Learners: *Yes.*

Teacher: *Now how did she feel when she met her friends down there?*

Learner: *She felt nice and happy.*

Learner 2: *And she said it wasn't so bad.*

Teacher: *Yes, she felt so happy because she met all her friends down there. She didn't splash into pieces the way she thought. Isn't it?*

Learners: *Yeah!*

The teacher asked the learners where rain comes from and the learners presented the following ideas: From heaven and from clouds in the sky. In explaining the process of rain formation, they explained that the clouds first gather together and then give us rain. They get together and then the sky becomes grey. Then the rain comes. The teacher asked them where we get water from. A learner replied from the river and the teacher asked where the river gets the water from. One learner replied from the clouds and the teacher added "from the rain, the water in the river comes from the rain".

Body of lessons

➤ Information sharing and seeking

The teacher first asked the learners questions before she shared the information of the topic with the learners. The questions were based on why water is important and how to use water sparingly without wasting it. These questions addressed the first and second objective of this lesson. The objectives were: Understand the importance of conserving water as part of the ecocycle. Learners should know why water must be used sparingly, what happens if it is not, and where water can be stored in the home.

The teacher asked the learners why water is important and the learners answered that water is life and water is health, we drink it, plants will die if they do not get water and the animals will die. The teacher added that water is important for plants and for the ... and the learners replied animals and people. The teacher asked what people use water for, and the learners replied, for washing, cooking, bathing, drinking, washing cars, washing clothes, washing your hands and washing your face. The teacher asked what will happen if there is no water. One learner answered that you will die. The teacher asked what we get from animals and the learners answered meat, milk and cheese. She asked what we get from trees and the learners answered fruit and vegetables. So if plants and animals do not have water they will die and we will not have food. One learner also explained that if we do not have trees around us we will not be able to breathe. The teacher further elaborated that we will not be able to breathe because the oxygen that we breathe comes from the trees.

The teacher asked the learners how to save water and the learners suggested that we can close taps, not throw water at each other, keep it in the fridge, and when you brush your teeth not leave the tap open.

Thereafter the teacher showed the learners a poster with pictures on how to save water (Plate 7: Photograph 18). The teacher asked the learners questions about the pictures on the poster on how to save water. The teacher and the learners discussed the pictures on the poster. The learners had to tell the teacher how the people in the pictures were using water in order to save it.

➤ Enquiry dimension

The teacher then asked the learners to go and find five other ways at home on how to save water (besides those shared already) and the learners had to report back on it the following day (Plate 7: Photograph 19). In reporting back the learners wrote their ideas on a blank piece of paper. The teacher called one learner of each of the five groups to the front to present these to the class. A summary of the ideas from the report back is presented below.

Learner: *I catch rainwater and store it in a small tank.*

Teacher: *Let's look at the third sentence. She said I catch rainwater and store it in a small tank. Is it the best way on how to save water?*

Learners: *Yes.*

Teacher: *Yes, it is very good. Okay, when it rains you can put some buckets outside, just to get the rainwater and you can use the rainwater also. We can use the rainwater for everything. Is it?*

Learners: *Yes.*

Teacher: *We can use the rainwater for drinking and washing. It is very good way.*

Learner: *My father fixes leaking toilets. Does the toilet waste water?*

Learners: *Yes teacher.*

Teacher: *Yes, if the toilet is leaking it wastes water. So it is better to fix the leaking toilets. Just to save water also. Very good!*

Learner: *When you are drinking water from the tap you don't throw it away.*

Teacher: *Is it also a correct way on how to save water?*

Learners: *Yes Ms.*

Teacher: *When you drinking water you don't throw it away but for unhygienic reasons it is only you who must use the water. You cannot let someone else drink from your cup. You can save it for yourself. So that you can drink later but don't give it to someone else. Do you understand?*

Learners: *Yes teacher.*

Learner: *Repair all the taps that leaks.*

Teacher: *Very important one. If the taps are leaking we repair all the taps.*

Learner: *You take a shower instead of a bath.*

Teacher: *So the shower is saving water. So we have to take showers instead of a bath. A bath uses a lot of water.*

Learner: *Water plants in the evening and not in the afternoon.*

Teacher: *So you have to water plants in the evening not in the afternoon.*

Learner: *Wash dirty dishes with hands and not with a dish washing machine.*

Teacher: *Now if you wash your dishes, some of you are having machines that wash dishes. So it is better to wash dishes with your hands then putting them in your machine. In the washing machine, you understand? So it saves water.*

Learner: *Throw water in a drain to recycle.*

Teacher: *Throw the water in a drain to recycle. So you must always throw the water in a drain to recycle. Where do we get the water from in Windhoek?*

Learner: *From the dam.*

Teacher: *We get it from the dam. Yes, we get water from the dam but in Windhoek, here where do we get the water from?*

Learners: *The River and the stream.*

Teacher: *Listen in Windhoek we recycle water also. You know that all the water that you use, all the water that you wash with, you throw the water in the drains. They recycle the water for us, they make the water clean and they send the water to us again. You understand.*

Learners: *Yes teacher.*

Teacher: *So it is very important to put water in the drain, just for the water to be recycled, then throwing it on the ground. Very good!*

The information as stated above addresses the second objective that was taken from the *Environmental Studies Curriculum*, namely: Learners should be able to know why water must be used sparingly, what happens if it is not, and where water can be stored in the home.

➤ Finding solutions

The teacher started this part of the lesson by asking the learners questions on what can be done to save water or to use water more sparingly. The solution that the learners came up with was to put up signs that show how water should be saved.

➤ Taking action

The teacher started this part of the lesson by telling the learners that they were going to make some signs on how to save water like they suggested as a solution on how to save water. The pictures that the teacher got for the learners were a combination of the teacher's ways (these pictures were the pictures she used at the beginning of the lesson) and the learners' ways (the teacher looked for pictures of what the learners presented from the enquiry they had to make at home). The teacher gave each learner a picture on how water should be used sparingly. Each picture had a message that explained how the water in the picture is used sparingly (Plate 7: Photograph 20). She asked the learners to read it. Thereafter she asked the learners to paste the pictures on cardboard and also to colour the pictures. When the posters were completed, she asked the learners to put it up in the girls' and the boys' toilets at the school (Plate 7: Photographs 21 & Plate 8: Photograph 22). This was done to remind learners to use water sparingly and to make sure that water is not wasted. However, these posters did not last long as they fell from the walls in the toilets and were never put up again.

Conclusion

➤ Reflection on whole lesson

In the last lesson of this topic the teacher first did revision about all the work done and then she did a reflection on the whole lesson which played out as follows.

Teacher *Now, we have put up posters in your bathroom or in your toilet. What happened? What did we learn from it? What did you do? How did you experience it? Did the people do what the posters were saying or what did you do? Did you just keep on wasting?*

Learners: *No teacher.*

Teacher: *Did you look at the poster and followed the instructions and follow what the poster was telling you or what did you do?*

Learners: *Yes teacher.*

Teacher: *Are you still leaving the taps open there in your toilets.*

Learners: *No.*

Teacher: *Are they still closed now.*

Learners: *Yes.*

Teacher: *Do you close the tap while washing your hands.*

Learners: *Yes teacher.*

Teacher: *Okay very good.*

Learner: *There must be a sign so that you cannot waste water.*

After the revision process the teacher gave the learners a worksheet to complete (Plate 8: Photograph 23). This information as presented above and below addresses the basic competency that was taken from the *Environmental Studies Curriculum*, namely: Explain how and why water can be saved and stored.

Analysis of learners' work is presented below:

➤ Qualitative analysis of worksheets

- Planned lesson competency

The worksheet concentrated on how water can be saved, but not on the second part of the required competency, which was why water should be saved. In this particular lesson the teacher focused on why water should be saved but did not include it as part of the summative assessment activity (LSWT2).

- Whether the questions in the worksheets were in line with the content of the lesson

What was looked at was whether the questions were in line with the content of the lesson. The worksheet achieved this. The questions in the worksheet concentrated on how water should be saved and the learners were also asked to look if the people in the pictures were saving or wasting water (LSWT2).

- What learners found easy to answer

What was looked at was what the learners found the easiest to answer. The questions that the learners found the easiest to answer were Questions 3 and 4. For Question 3, only one learner could not fill in a word from a choice of five in the following “_____ the tap while you wash your hands”. This might have been because the learner did not read the words carefully enough or maybe did not read the question carefully enough or maybe did not know the answer or could not read or did not know English very well. Question 4 was: Use a _____ instead of a hosepipe to wash the car. This question the learners also had to complete by filling in one word from a choice of five words. Only one learner could not answer this question correctly (LSWT2). The reason why this learner could not answer this question correctly might have been for the same reasons as stated for Question 3 above.

- What learners found most difficult to answer

What was looked at was what the learners found the most difficult to answer. The question that the learners found the most difficult to answer was Question 8. Twelve learners could not give a correct answer. Question 8 was: Are the children trying to save water? Write what the children should be doing. This question required more structured answers which the learners had to answer in the form of a sentence. The reason why these learners could not answer this question correctly might have been that they could not express themselves clearly enough in writing the answer, or they did not grasp the content of the lesson very well.

- Whether the learners were able to apply the content knowledge that was required during the lesson to their context

In this worksheet the teacher asked the learners how water should be saved, using examples and pictures that directly relate to their own context (LSWT2).

➤ Quantitative analysis of worksheet

The outcomes of the worksheet done with the Grade 2 learners were measured according to the results the learners obtained (LSWT2). Only 39 of the learners took part in the completion of this worksheet. One learner was absent on the day that the learners completed the worksheet. In this worksheet one learner scored less than 50% and 15 learners scored between 50% and 80%, whereas 23 learners scored more than 80%. The outcome of the results of the worksheet can be found in Table 4.3, Appendix F summary of Grade 2 – assessment results.

GRADE 2: PLATES 6 – 9

PLATE 6

Dorothy Raindrop

Clouds are gathering. There is a rolling and turning in the sky. The clouds become heavy with all the **drops of water** they have gathered. They soon become so heavy they can't carry all the raindrops anymore.

Plimp! Falls the first raindrop. Plimp! Falls another. Plimp, plimp plimp! Dorothy raindrop sits on the edge of the cloud. "Please help! I am afraid of high places and I don't want to fall so far without a parachute," she begs, but the other raindrops aren't listening. Plimp, plimp, they jump to the ground.

"Oh, please hold my hand!" cries Dorothy, but it is too late. Cloud has let go of her and there she goes! "Oh, I'll rather close my eyes," she yells. "I don't want to see where I'm going. What if I splash to pieces? Who will put me together again?" Then she falls splash! on the ground.

"Hey, Dorothy, You made it!" everybody in the puddle cries out. Dorothy opens her eyes. It wasn't so bad, after all. Here are her friends. All in the same **puddle**. They talk about their journey. Dorothy can't say much, her eyes were closed.

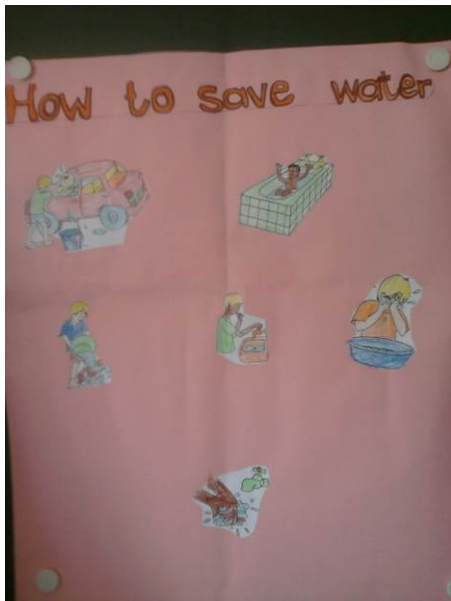
Oh no, someone has fallen on her head! One more! And another one! "No, goodness, now the puddle is too full. Let's find another place." She and a lot of friends run out of the puddle. They are joined by friends from other puddles.

"Come with us to the **river**," some of them call. "We are going to the **lake** where there is place for all of us." Dorothy goes with the **stream**. Along the way she greets everybody she knows. "All my friends are here now, and lots of drops from other clouds. This is a very jolly journey!" says Dorothy.

Suddenly Dorothy lands in a big lake. Oh, oh! All strange raindrops! But Dorothy quickly forgets to be afraid. All the other drops of water come from clouds, she knows. They also feel lonely. Now they are glad to meet another friend. Dorothy lies down to rest after a long, interesting journey.

Photograph 16: The story 'Dorothy Raindrop'.

PLATE 7



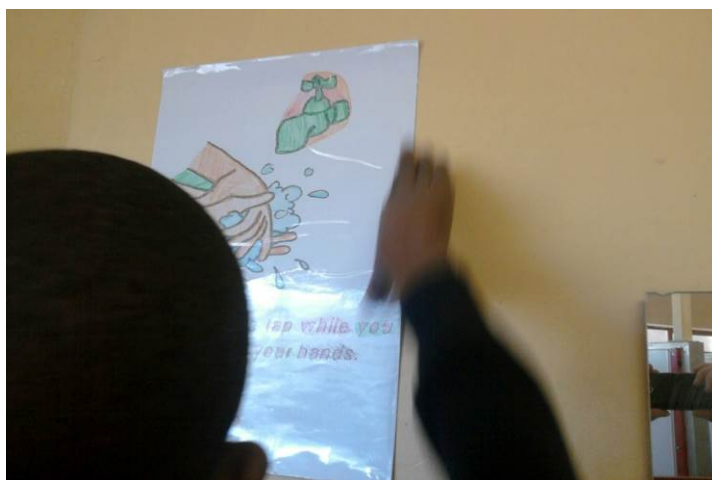
Photograph 17: Poster of water saving ways.

How to save water, Johanna
① I close the tap when I am brushing my teeth.
② I put water in a bucket when I wash the car.
③ I catch rain water and store it in a small tank.
④ My father fix leaking toilets and broken geysers before the water get wasted.
⑤ We put a brick to stop the leaking of the cistern of our toilet.

Photograph 18: Learner's work of how water is saved at home.



Photograph 19: Learners colouring the pictures on the posters on how to save water. It said 'Turn of the tap' and 'Re-use your dirty water to water plants or trees'.



Photograph 20: Water saving poster that was put up in the boys' toilet.

PLATE 8



Photograph 21: Water saving poster that was put up in the girls' toilets.

10/10 Excellent!
16.09.2012

Worksheet: How to save water

Fill in the missing words

Close, little, bucket, Re-use, enough

1. Use only a little water to wash your face.
2. Use just enough water to bath.
3. close the tap while you wash your hands.
4. Use a bucket instead of a hosepipe to wash the car.
5. Re-use your dirty water to water plants or trees.

Circle the correct words:

6. Wash with enough / a lot of water.
7. Shower for 3 minutes / 60 minutes.
8. Are these children trying to save water? NO
Write what the children should be doing.

①



Use a few water to wash your face.

②



Close the tap while you wash your hands.

③



Close the tap while brushing your teeth.

Photograph 22: Worksheet done by learners on water saving ways.

4.3.3 Implementation of the active learning framework: Grade 3 (Teacher 2)

Context of case

The Grade 3 learners who took part in the lesson were 8-10 years old and the majority of the group turned nine during the school year. The teacher who presented these lessons is a qualified Lower Primary teacher (Grades 1-4) who obtained her qualification from the Windhoek College of Education, currently called University of Namibia, Khomasdal Campus.

The presentation that follows was extracted from mini-case story 3 (MCS3).

Syllabus links

The information as presented below came from the teacher's lesson plan with reference to the *Environmental Studies Curriculum* for Grade 3 (See Appendix: L).

Theme: The Social Environment

Topic: Infrastructure and Communication

Sub-topic: Traffic Safety

The stated objective for this lesson is presented below:

- Learners will be able to understand that traffic safety depends on correct behaviour and following safety codes on the road

This objective was used for formative assessment for the activities that were used during the presentation of this topic.

The stated basic competency for this lesson that came from the *Environmental Studies Curriculum* was as follows:

- Explain road safety and traffic rules for cyclists

The basic competency was used to determine whether the learners have mastered the knowledge, skills and attitudes by explaining road safety and traffic rules for cyclists.

Area of focus

The focus area of this particular topic was safety on the road. The reason the teacher chose this topic was that the school experiences problems in the parking area outside the school. Parents or drivers just park wherever they want to and this influences the flow of traffic in the parking area outside the school.

Introduction of topic

The topic was taught over four periods of forty minutes each.

The teacher started the lesson by asking the learners to recite a rhyme in order to stimulate their prior knowledge of the topic. Thereafter she asked them questions about the rhyme which they answered as follows:

Teacher: *You were saying that when you go with your little bicycle that you bought at the shop and you see the big red light you have to stop. Do you see the big red light?*

Learners: *Yes teacher.*

Teacher: *When you are riding your bicycle?*

Learners: *Yes!*

Teacher: *Where?*

Learners: *At the traffic lights.*

Teacher: *So you call that red light that you see, is a what?*

Learner: *Traffic light.*

Teacher: *So where is this thing? Is it in your street, on your road or where is it?*

Learner: *On the road.*

Body of lessons

➤ Information sharing and seeking

The teacher started this part of the lesson by showing the learners pictures (Plate 9: Photograph 24). She asked them questions about the different traffic signs as follows:

The first question that the teacher asked was why they thought the traffic signs were on the road and one learner replied to keep us safe on the road. She then asked how it will keep them safe on the road and the one learner answered it helps the people that are driving along the road. The teacher furthermore said that learners can also cause accidents if they do not obey the traffic signs on the road. She also stated that these traffic signs are on the road to keep people safe on the road and to avoid accidents. She asked the learners to read the topic for the day which was written on the chalkboard. The topic was *'Safety, accidents on the road'*.

She then asked the learners who uses the road. The learners replied car drivers, passengers, pedestrians and cyclists. The teacher wrote these words on the chalkboard for the learners to read.

The teacher then showed the learners different road signs and she asked them what the road signs are used for. She told them that there are three different categories: Information signs, warning signs and regulatory signs (Plate 9: Photograph 24). The learners had to say if the signs that the teacher displayed on the chalkboard were information signs, warning signs or regulatory signs.

The teacher went on asking more questions about the traffic signs.

Teacher: *You say they help us not to cause accidents on the road. Isn't it? Who is this sign warning? You said it is a warning sign. Who is the sign warning? Is it warning you?*

Learner: *Pedestrians.*

Teacher: *It is warning the pedestrians. It is telling you the person who is walking, be careful. Don't walk there because there are children crossing, is that so?*

Learner: *The car drivers.*

Teacher: *It is warning the car drivers. So they can do what?*

Learner: *Slow down.*

Teacher: *Slow down because if they drive very fast, what will happen then?*

Learner: *They can cause an accident.*

Teacher: *They can cause an accident by doing what?*

Learners: *Bumping the children.*

Teacher: *They will run over the kids. They might bump the kids that are crossing the street. So it is very important. It is warning the car drivers as well as the?*

Learners: *Cyclists!*

The teacher asked a lot of questions around the traffic signs in addition to the questions listed above. What the signs mean and who they are warning and why.

The teacher told the learners that she wanted them to act like road users, where some learners would be car drivers, some would be pedestrians, some would be passengers and some would be road signs (Plate 9: Photograph 25-27). It played out as follows in the lesson:

Teacher: *Okay, there are road signs on the road. You are the driver, the car driver. Listen here. You all are going to use the road coming from here so that we can see the road signs. He is the car driver, he is driving that side. And you are the pedestrians. Okay pedestrians, this is the sign and it is the same sign that is here. Okay he is driving, you will also be driving. The pedestrians, pedestrians you want to cross the road. You want to show me how you can use the zebra crossing the correct way. The car is coming there and you must look at the distance. The distance of the car and then you use the road. The car, you want, don't be fast. Don't be fast they need to cross the road. The car has to move slowly, make sure that you are crossing the road. You want to cross. You have to cross, cross the road. You look at the car and you cross. Okay, the car is coming. Pedestrians the car is coming. Now others want to cross. You wanted to cross the car is here. What do you do? The car is here. What are you going to do? The car is close to the zebra crossing. Who can give me the answer?*

Learner: *Teacher we have to stop for the car to pass.*

Teacher: *They have to wait on the side or the pavement so that the car can.*

Learners: *Cross.*

Teacher: *Pass, and then they are going to cross.*

The reason why the learners stopped in order for the car to pass was because the car was already at the zebra crossing before they were there.

Teacher: *Another car, wait okay wait. The other car must, there is a stop here. All of you follow this car. There is a stop come car you have to drive. Then look at what the car driver is doing. He came at the stop. Okay, start, good. He looked, he looked where, and he looked where first?*

Learners: *Right, left.*

Teacher: *And then.*

Learners: *Right again.*

The information as presented above speaks to the objective that was taken from the *Environmental Studies Curriculum* which was: Learners will be able to understand that traffic safety depends on correct behaviour and following safety codes on the road.

➤ Enquiry and reporting back

After the role play the teacher gave the learners homework (Plate 10: Photograph 28). The learners were asked to go and observe how the pedestrians and car drivers use the road and report back the following day. They had to observe after school and in the morning when coming to school the following day.

The next day the teacher asked the learners to report back on the observation that they made the previous day and early in the morning on their way to school. The observation they had to do was to look how people and car drivers use the road and how the car drivers use the parking area in front of the school. The learners' report back was as follows:

Learner: *Teacher, the children of our school. When the car is driving they are going to walk in front of the cars.*

Teacher: *They were walking in front of the cars, was that correct or not?*

Learners: *No!*

Teacher: *What else did you see?*

One learner: *Two kids yesterday, when we were driving in the car, they just ran through.*

Teacher: *Ran through.*

Learner: *Yes teacher and while the kids were just walking there.*

Teacher: *They were almost bumped?*

Learner: *Yes teacher.*

Teacher: *You see, was that the correct way of a pedestrian to use the road?*

Learners: *No.*

Teacher: *And what else did you see?*

Learner 1: *The other car did just come very fast and a lot of cars were just stopping there and they just quickly stopped before people got hurt.*

Teacher: *That is a very dangerous thing to do. You see when there is a zebra crossing there is a sign okay. The cars are crossing or are driving through and you just run in front of them to cross. The rules that we learnt yesterday you have to follow them.*

Learner 2: *Yesterday after school my uncle did park where there is no road lines saying you can park there. He has to go back then I told him don't park there tomorrow.*

Teacher: *You see the person parked there next to the pavement where there are no lines saying that you can park there and it is a good thing that he learnt this thing yesterday and all the other days. Maybe as he use the road he knew it is very wrong for someone to park where there is not a parking sign. Very good that you told your uncle! What did the person say?*

Learner: *He said okay I will not do it again.*

Teacher: *Good it means that it is working what we are learning from the class is working. We have to put it into practice.*

Learner: *Yesterday there was a boy riding his bicycle in front of the car then he looked at the back he fell down the bicycle while there was a car coming.*

Teacher: *You see. When you riding a bicycle you must be careful, that is why the bicycle needs to have mirrors on both sides. So that you can see from the back, you cannot turn your whole head and your neck to the back.*

Teacher: *I was also observing. What I have seen was the cars were too many and they were moving too slow and many car drivers they got tired of waiting too long in the road that they were driving in. They wanted to go you see they wanted to go maybe they are picking up their kids here at our school. The other kids there at MH Greef you see. They were running late. What I saw also is that many parents did not park in the correct parking at the parking.*

➤ Finding Solutions

The lesson continued with the following discussion:

Teacher: *We have been talking about this in the parent information meeting. Every time we have a meeting we tell your parents that you have to park in the correct parking space. Do not*

park in the wrong area. We have been telling them that do not rush when you are driving at the school street because the learners might run through or might try to cross and you might bump them. We have this problem. What do you think we should do? We cannot solve the problem. Who do you think we should contact so that he can solve this problem for us? Who is responsible for the road and all these things?

Learner: The traffic officer.

Teacher: Now how are we going to talk to the traffic officer?

Learner: We can contact him.

Teacher: How can we contact the traffic officer?

Learner: Send a letter from the class.

Teacher: Send a letter. I think that is a good idea. We can send a letter to the traffic officer with all the problems that you were just saying here. Isn't it?

Learners: Yes, teacher.

Teacher: I think it is a good solution.

Teacher: Do you have any other ideas?

Learner: Here in front of the school a traffic officer can come at the school.

Teacher: It is good, which means the traffic officer will solve our problem as from now on. Is it good for us to obey the road signs?

Learners: Yes teacher.

Teacher: What will it solve?

Learner: It will keep us safe.

Teacher: It will keep us safe and it will not?

The learners replied: No accidents.

➤ Action taking

The solution that the learners collaboratively decided on was to write a letter to the traffic department in order to help the school with the problem in the parking area, namely that car drivers who park wherever they want to and this hinders the flow of traffic (Plate 11: Photograph 29). In this part of the lesson the teacher asked the learners what they wanted to write in the letter that they wanted to send to the traffic department.

The learners stated that the following should be written in the letter:

People should not drive when they are drunk. They must put up more traffic lights. He should tell the parents not to park in front of the gate but in the parking area. The traffic officer must give them a fine.

Conclusion

➤ Reflection on whole lesson

The teacher started this part of the lesson by asking the learners questions about all the work done.

Teacher: *Now since we wrote the letter to the traffic, the traffic didn't respond yet to our letter. Isn't it!*

Learners: *Yes, teacher.*

Teacher: *We are still waiting for him to come and sort out the problem at our parking, since that time when we talked about it you can see a change? Or is it still going the same?*

Learners: *Still going the same.*

Teacher: *Okay, about yourself. How are you crossing the road? You are not the one to drive. How are you crossing the road are you really following the road signs or you just crossing the road and how?*

Learner: *Teacher, following the road signs.*

Teacher: *Uh-huh! What are you doing at the zebra crossing? What is it that you are doing when you come there and you want to cross? How are you crossing there?*

Learner: *Teacher if you see that one car is still there in the car park and while it is coming to drive you cross the road.*

Teacher: *Is that what you are doing?*

Learners: *Yes teacher.*

Teacher: *And for you! I warned you that your parents are dropping you off in the middle of the road rather than driving into the parking area. Some of your parents were dropping you off in the road. What are you doing about it or what did you do about it? Are you still being dropped there or what happened then after our last discussion of this topic.*

Learner: *I told my mother not to drop me there at the road because our teacher said it is not safe.*

Teacher: *When she comes at the parking area where does she park?*

Learner: *In the parking area.*

Teacher: *In the parking space or does she park anywhere?*

Learner: *In the parking space.*

Another learner: *My father dropped me off at the gate.*

Teacher: *In front of the gate and what did you do about it because that is the wrong parking area. What did you do?*

Learner: *Nothing teacher.*

Teacher: *Anyone else!*

Learner: *The taxi wanted to drop me at the zebra crossing and then I said who gave you the permission to drop me here go to the school.*

Teacher: *You told the taxi driver that?*

Learner: *Yes.*

Teacher: *That is very good because it is for your safety isn't it? And also for the safety of the other road users, isn't it?*

Teacher: *Hopefully when the traffic officer will respond to our letter I hope he will come and sort out this mess; the traffic difficulties that we have at our parking area and also at the road next to the parking area.*

After this discussion the teacher gave the learners a worksheet to complete and explained it to them (Plate 12: Photograph 30). The worksheet was about the identification of different traffic

signs, explaining what each means and asking what they would do if they were traffic officers. The information as presented above and below addresses the basic competency that was taken from the *Environmental Studies Curriculum*, namely: Explain road safety and traffic rules for cyclists.

Analysis of learners' work is presented below:

➤ Qualitative analysis of worksheets

- Planned lesson competency

What was looked at was what the basic competency of the lesson was to determine if the worksheet was designed according to the stated basic competency. This was achieved because the questions in the worksheet required the learners to identify traffic signs and traffic safety in general (LSWT3).

- Whether the questions in the worksheets were in line with the content of the lesson

What was looked at was whether the questions were in line with the content of the lesson, and this was also achieved. The questions the worksheet concentrated on were to identify different traffic signs, how traffic officers ought to ensure traffic safety and what the learners would do if they were traffic officers (LSWT3).

- What learners found easy to answer

In this worksheet the learners found Question 1 the easiest to answer. Eight learners could not answer this question correctly (LSWT3). Question 1 was: Identify the signs and say what they tell road users. This question required the learners to answer the question only with one word or a short sentence. The reason why these learners could not answer this question correctly might have been that they did not remember the content of the lesson very well.

- What learners found most difficult to answer

In this worksheet the learners found Question 3 the most difficult to answer. Fifteen learners could not answer this question correctly (LSWT3). The question was: What would you do if

you were a traffic officer and someone drives too fast or someone parks at the place that should not be parked on or in the driveway or in front of the gate? This question required more structured answers where the learners had to answer in full sentences. The reason why these learners could not answer this question correctly might have been that they could not express themselves very well in writing down the answers or they did not remember the content of the lesson very well.

- Whether the learners were able to apply the content knowledge that was required during the lesson according to their context

In this worksheet the teacher asked the learners to apply the content knowledge in their context because they were asked how they practise the traffic rules outside on their way home. They explained to the teacher how they did it (LSWT3).

➤ Quantitative analysis of worksheet

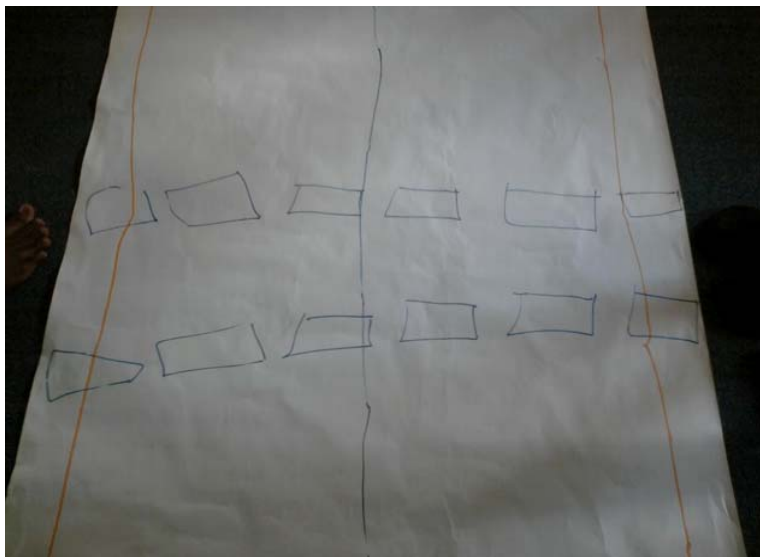
The outcomes of the worksheet were measured according to the results the learners obtained. Only 38 of the class group took part in this process. In this worksheet 11 learners scored less than 50% and 23 learners scored between 50% and 80%, whereas four learners scored more than 80%. The outcomes of the results of the worksheet can be found in Table 4.4 Appendix F summary of Grade 3 – assessment results.

GRADE 3: PLATES 9 – 12

PLATE 9



Photograph 23: Pictures of traffic signs.



Photograph 24: Picture of a Zebra crossing.

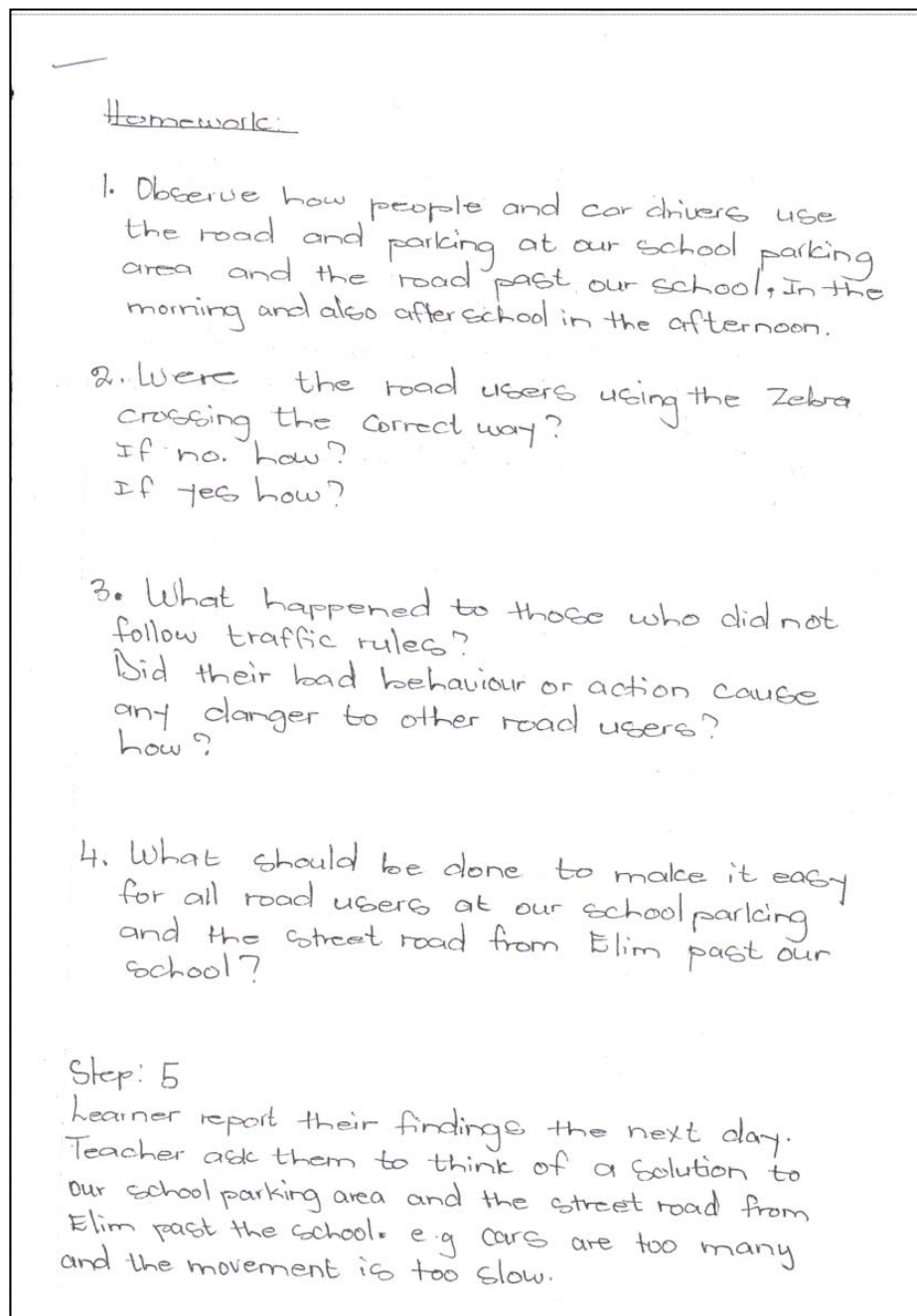


Photograph 25: Picture of a learner being a stop sign.



Photograph 26: Picture of a learner being a pedestrian crossing sign.

PLATE 10



Photograph 27: Questions given to learners for the enquiry they had to do for homework.

PLATE 11

Hermann Gmeiner Primary School
P. O. Box 10057
Windhoek
Namibia
16 July 2012

Dear Sir/Madam

RE: Safety on the road and parking for our school.

The Grade 3 learners of Hermann Gmeiner Primary School, we hereby would like to inform you about our concerns for our road and parking safety.

Our school is along the Kornalyn Street in Khomasdal. We are experiencing difficulties to walk across the parking area and the road.

In front of our school is there a parking area for parents to park while waiting for their children to come out of the school yard. At this area, parents are not always parking in the parking lanes rather, parks at any open space, mostly this space is the drive through way. This is causing other parents to wait longer than they supposed to. These types of drivers are blocking other cars from living the premises on time or in order. Some parents park their cars in front of the school gate and block teachers from driving out as well. Some drivers are also parking in front of the exit path to pick up their passengers. Some are stopping in the road to drop off passengers. All these behaviour is causing or delay for other road users. It is also putting these passengers in danger from other car drivers, as they can easily be ran over or being bumped.

For us learners who cross over the road, we are facing danger from the reckless driver who are frustrated and in a hurry to go. Most of the time they over speed and do not want to stop while we cross. On the other hand the drivers get impatient from waiting too long in the traffic queue and over speed when they get a chance.

Our requests to your office are, it will help if you will put another traffic light at the junction roads of Kornalyn street and the one that goes to Hermann Gmeiner Primary School. It will be good if you can put up a big written sign that says no parking in front of the school gate. We also think that you must give fines to those who are not obeying the traffic rules. Please arrest those who received fines already. We want you office to punish those that are dropping off and picking up their passengers on the road rather than at the parking. Punish those that are using bad words and body signs to other drivers.

Our safety is in danger if this behaviour continues. We believe and trust that your office will assist us to be safe.

Thank you for your understanding

Yours faithfully

The Grade 3 B class

Photograph 28: Letter that was written to the traffic department.

PLATE 12

Environmental Studies Grade: 3

Level: 1 $\frac{20}{10}$ Date: 22/01/2016

1. Identify the signs and say what they are telling road users.

 Stop - you must stop

 no bicycles

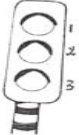
 Don't overtake
you must not overtake

 children are crossing here

 Don't drive faster than 100

 No crossing
you must not cross here

What traffic sign is this?

 ← traffic light

Can you tell what the colours of the lights are and what each colour means?

1. red - you must stop 2. orange - you must wait

3. green - you can go

Level: 2

How do traffic officers help to ensure our safety? Complete the sentences in block A by matching them to the phrases in block B. Draw a line to the correct sentence in B.

A	B
1. They check	• checks that people do not drive too fast
2. They assist	• assists at road accidents
3. They make sure	• prevents overloaded vehicles from using the road
4. They regulate	• makes sure that motor vehicles are roadworthy
5. They prevent	• regulates traffic for example at

Level: 3

what you would do if you were a traffic officer and

someone drives too fast

I would have arrested them

Someone parks at the place that should not be parked or in the drive way or in front of the gate.

I will give that person a fine to pay 1000\$ or send her/she to prison.

40 correct
38

Photograph 29: Worksheet done by learners on traffic safety

4.3.4 Implementation of the active learning framework: Grade 4 (Teacher 3)

Context of case

The Grade 4 learners who took part in the lessons were between 9 and 12 years old and the majority of the group turned ten during the school year.

The teacher who presented these lessons to this class group is not qualified as a Lower Primary teacher (Grades 1-4) but is qualified as an Upper Primary teacher (Grades 5-7). The teacher achieved this qualification at the University of Namibia, Khomasdal Campus.

The presentation that follows was extracted from mini-case story 4 (MCS4).

Syllabus links

The information presented below came directly from the *Environmental Studies Curriculum* for Grade 4 (See Appendix: L).

Theme: The Natural Environment

Topic: Environmental Care

Sub-topic: A healthy environment – Waste Management

No lesson plan was received from this teacher so I could not draw any objectives from it as I did with the other three topics that were presented to the Grades 1-3 learners. Instead the best fit objective for this particular topic was drawn from the *Environmental Studies Curriculum* which is as follows:

- Develop understanding that a healthy environment is important for our basic needs, and develop a sense of care for the environment

This objective was also used for formative assessment of the activities that were used during the presentation of this topic.

The basic competencies as stated in the *Environmental Studies Curriculum* are as follows:

- Distinguish between environmental factors affecting health negatively and positively
- Describe ways in which they can contribute to environmental care

These basic competencies were used to determine whether the learners have mastered knowledge, skills and attitudes to consider the effects waste has on human life and to describe ways in which they can contribute to environmental care.

Area of focus

The focus area of this particular lesson was waste management with the emphasis on how to re-use organic substances in order to manage waste and to do something for the environment.

Introduction of topic

The topic was taught over five periods of forty minutes each.

The teacher introduced the lesson by asking a learner to read from the textbook to the rest of the class.

Learner: People live together in groups. All the people living together in one place make up a community. Communities can be in villages. People need many things to live. Getting these things can cause problems for the environment and for people's health.

The teacher asked the learners to look at two pictures in the textbook and state what was happening in them. They identified the pictures as follows: Plants, water, food, meat, houses, cans in the water, clean environment for fresh air.

Body of lessons

➤ Information sharing and seeking

The teacher asked the learners questions about the two pictures. The discussion went as follows:

Teacher: If you look at the pictures. These are all the things that people need to live. So here are certain things that will cause health problems to the human life. What are the things that you can see that can cause problems?

Learners: waste of electricity, waste of water, waste of food, air pollution, they are washing the clothes in the water and are playing in the water and the animals also need to drink water from there.

Teacher: Now people if you look at the first picture what things do you see lying around there?

Learners: Cans are lying around, plastics, dirt, tree trunks, glass that is floating in the water.

Teacher: *Who can tell me what we call these things? There is one word for all these things. Cans lying around, glass floating in the water, all those dirt there what do we call it?*

Learners: *Garbage, dirty environment, unwanted things, rubbish, waste.*

Teacher: *Waste! So all these things they are waste.*

The teacher asked the learners to discuss in their groups what the definition of waste is. The learners discussed it and reported back as follows:

Group 1 - *The definition for waste is when you are not using it. You are throwing it away and when you don't need them anymore.*

Group 2 – *Waste is like when you use something over the limit. Like when you brush your teeth you should only use water. You can use water but you shouldn't use over the limit.*

Group 3 – *When you wash off your hands and you forgot to close the taps it means, you are wasting water.*

Group 4 – *The definition of waste is when you throw away something that is needed.*

Group 5 – *Waste is papers that are in the house.*

Teacher: *People when we talk about waste as in the things you saw in the picture. Like cans, plastics, glass in the water; give me a definition for this type of waste. Concerning things like this not when you waste something. Now when you waste something like when you use something that you don't need in excessive; I want another definition. If something is not useful to you. What will it be to you?*

Learner: *It will be dirt. It will be rubbish.*

Teacher: *What is the opposite of useful?*

Learner: *Useless.*

Teacher: *So waste is useless materials, substances or parts that are left after you used something.*

Teacher: *So now these things that are lying around, what do you think people can do to stop wasting?*

Learner: *The people can also recycle all those stuff.*

Teacher: *So what does recycle means?*

Learner: *Recycle means to make something new.*

Teacher: *To make something new again.*

Teacher: *Write today's date and you quickly copy the definition of waste.*

The definition of waste that the learners had to copy was as follows: Waste is the useless material, substances or plants that are left after you have used something (Plate 13: Photograph 31).

The teacher then gave the learners homework (Plate 13: Photograph 32). The learners had to answer the following questions at home: What is the difference between hazardous waste and municipal solid waste? Describe what is meant by the three R's: Reduce, re-use and recycle. What are the benefits of the three R's? She explained all the questions before they went home. The teacher wanted the learners to find the information for themselves rather than just giving it to them.

The following day the teacher and the learners discussed the answers about the homework that was given to them the previous day, namely to give the definition of hazardous waste and municipal solid waste. After discussing the answers that the learners got for these questions, the teacher gave them her own definition, which they had to copy from the chalk board (Plate 13: Photograph 33). The definitions of these two questions given by the teacher were as follows: Hazardous waste is waste that poses substantial or potential threats to public health or the environment. The characteristics of hazardous waste are ignitability (i.e. flammable), reactivity, corrosivity, toxicity (these words were not explained to the learners for understanding). Examples of hazardous waste are exhaust fumes from the cars and factories or coal power stations. Municipal solid waste is commonly known as trash/garbage and it consists of everyday items that are discarded by the public. Examples of municipal solid waste are dumping sites and household rubbish bins.

The teacher then asked the learners to give examples of hazardous waste and municipal solid waste, but the learners were not able to answer the question. The teacher then gave the question to them as extra homework. The learners were asked to get this information at home with the help of their parents.

The following day the teacher did not ask the learners for feedback on this task. She started the next lesson by asking the learners how people can deal with waste. The teacher and the learners discussed this question to which the learners replied that waste can be recycled and re-used. She then asked the learners apart from recycling and re-using, what else can be done with waste. The learners could not come up with another way of dealing with it. In the discussion of how people can deal with waste the teacher did not quite explain to the learners what re-use, recycle and reduce mean, or why waste materials are re-used, recycled and reduced. However, she did give them the correct explanation by giving them a hand-out that they had to paste in their workbooks (Plate 14: Photograph 34). The information as presented above and below addresses the objective that was taken from the *Environmental Learning Curriculum Guidelines for Educators*, namely: Encourage a sense of personal and social responsibility and a desire to work cooperatively with others on an environmental concern.

➤ Enquiry and reporting back

The teacher discussed a worksheet with the learners which they had to complete at home. The questions on the worksheet were as follow: What effect does waste have on human life? What are the environmental effects? What waste management issues are involved? What can you do to protect your local environment?

The following day the teacher and the learners discussed the answers of the homework that was given the previous day. (Plate 15: Photograph 35). The teacher asked learners to read the first question.

Teacher: *The first question was?*

Learners: *What effects waste has on human life?*

Teacher asked the first learner to answer.

Learner: *It causes disease when they drink water from rivers which have waste and which makes them sick.*

Learner: *It can cause infection and disease.*

Teacher: *How?*

Learner 1: *Humans get sick because of the polluted air.*

Learner 2: *It cause diseases such as lung diseases caused by air pollution, water pollution can cause abnormality to pregnant women.*

Teacher: *Number two! What are the environmental effects? So meaning what effects does it have on the environment?*

Learner 1: *The waste can kill the plants and leave the environment without any plants. We can also burn the waste but the smoke is also very bad for the environment.*

Learner 2: *It causes harm to the natural animals and plants.*

Learner 3: *The pollution, example air pollution, water pollution and waste pollution and global warming, it can pollute the environment.*

Teacher: *It can pollute the environment. So number three. What waste management issues are involved?*

Learner: *All waste must be handled carefully and burnt.*

Teacher: *If you burn the waste what will happen?*

Learner: *Smoke will come out.*

Teacher: *And what will happen?*

Learner: *The smoke will pollute the air.*

Another learner said: *Waste removal such as the municipality and community gatherings can encourage each other to assist and keeping the environment clean.*

In this discussion with the learners the teacher did not explain to the learners what waste management is and how waste is managed at landfill sites or what the purpose of a landfill site is. This information was also not available in the textbook that was used for the lesson presentations of this particular topic.

➤ Finding solutions

The teacher told the learners that there are different ways for people to deal with waste. She asked them to give some examples. The learners replied as follows:

Learner 1: *By keeping the environment clean.*

Teacher: *How?*

Learner: *They can pick up the papers that, all the things that are lying on the ground.*

Teacher: *So how will they do that?*

Learner 2: *You must inform the people of the danger of littering. So they can put the waste in.*

Teacher: *So how will you inform them, by doing what? Quickly in your groups discuss only one way how you will inform people.*

The learners gave feedback.

Group 1: *We decided that the best way that we can stop waste is that we can make a poster and then we can just put the posters around at areas where people can see it.*

Group 2: *We discussed about putting signs up everywhere and writing on the boards no dumping.*

Group 3: *We discussed that we can also send the news by, for example when we call the radio station we can tell or for example you can even go, you can even, you can even go to the news papers.*

Group 4: *You can even give information by sending an email.* Teacher: *Sending an email and writing what?* Learner: *A letter.*

Group 5: *We can even talk on the news about those things and you can even make copy papers and put them on the walls at some areas.*

Group 6: *We can inform them by putting posters around their houses or even at the rubbish bins you can put posters there.*

Teacher: *Those are only different ways on how you can inform people, to stop wasting.*

Teacher: *What other ways are there to reduce or to stop waste?*

Learner: *Put up posters, making people aware of the dangers of dirt and educational programmes.*

The information as presented above addresses the objective that was taken from the *Environmental Studies Curriculum*, namely: Develop an understanding that a healthy environment is important for our basic needs, and develop a sense of care for the environment.

The teacher did not respond in detail to the answers of this question. This might have been because she had a pre-determined action in mind which she wanted to teach the learners, but the learners could not quite get to this specific solution of waste management.

This might be why she asked the learners the following question. The discussion went as follows:

Teacher: *Quickly discuss in your groups what do you think is a compost heap?* The teacher asked the learners to give feedback.

Group 1: *We think that a compost heap has to do with things with waste.*

Teacher: *Group 1 said it has something to do with waste. Now listen to what this learner is reading. Then you tell me what exactly it is?*

Learner: *A mixture made up of useful scraps or of food and other materials that can be left to rot and then it helps plants to grow.*

Teacher: *So what is it exactly?*

Learner 1: *It might be soil.*

Learner 2: *Compost.*

Teacher: *We said it has something to do with waste and then she said it is a mixture of some things. So now you have your two key words, so give me a clearer explanation.*

Learner 3: *It is an untidy pile.*

Teacher: *Of what?*

Learner: *Untidy pile of waste.*

Teacher: *Not untidy. It will look untidy but it should be arranged. So it is a mixture of different types of waste. So tomorrow you bring any type of waste that you can find at home. So everyone will come with a plastic. Is it clear?*

Learners: *Yes Ms!*

➤ Taking action

The following day the teacher asked a learner to explain what a compost heap is.

Learner: *A compost heap is a deep hole that people can throw rubbish in.*

Teacher: *Any type of rubbish or specific type of rubbish?*

Learner 1: *We just like throw anything that is rotten, any materials, we can just throw there, and then we can just throw every day. Then it will become big, almost like a triangle shape but not, it will become like a cone.*

Learner 2: *I think a compost heap is they put garbage in groups, separate groups.*

Teacher: *Separate groups, so what do you think, which groups will we use now?*

Learner: *We use like rotten food, papers and like bottles that are broken.*

After the teacher asked the learners what a compost heap is the Agriculture teacher took over to demonstrate to them how they should dig a hole for a compost heap (Plate 15: Photograph 36).

After the Agriculture teacher demonstrated how the learners should make the hole, the class teacher took over again.

Teacher: *So who can tell me what organic substances are?*

Learner: *I think it is rotten food.*

Another learner: *I think it is the food that we eat and then we throw it away.*

Teacher: *That is the food that we going to use. So if you have organic substances, just stand on this side.*

The teacher asked the learners to put the layers on step by step. She asked one learner to put leaves at the bottom. Then she asked the learners to bring their food waste and put it on. She then asked them to cover it with soil. They repeated this until the compost heap was completed. The teacher then told the learners that this is how a compost heap is made.

After the compost heap was completed the teacher asked the learners questions.

Teacher: *What do you think we should do now?*

Learner: *Throw water.*

She asked one learner to water the compost heap.

Teacher: *What do you think will happen to all the things that we have put there?*

Learner: *They will grow.*

Teacher: *Will they grow?*

Learner: *They will get rotten and they will become fertiliser.*

Teacher: *They will become rotten and they will become fertiliser. So that is how we make a compost heap and that is why people also make a compost heap for fertilisers. When we get to class you will get an activity which you will need to complete at home.*

The activity the learners had to do at home was to explain how a compost heap is made and also to make a drawing of the compost heap (Plate 15: Photograph 37).

Conclusion

➤ Reflection on the whole lesson

In the next lesson the teacher revised the whole content done on the topic with the learners. She started the lesson by asking the learners questions.

Teacher: *So we discussed different ways that people can deal with waste. What were those ways?*

Learner: *Reusing cans and tins.*

Teacher: *Reusing.*

Another learner said: *You can recycle.*

The next learner said: *Even reducing.*

Teacher: *So it is reduce, reuse and recycle. There was one other way that we also dealt with waste.*

One learner said: *Compost.*

Teacher: *What is the proper name?*

Learner: *Compost heap.*

Teacher: *We also did a compost heap.*

The teacher then asked the learners to share what they had written in their books on how to make a compost heap. Different learners were asked to read the activity that they had to do for homework from their workbooks. It played out as follows in the lesson.

Learner 1: *You first dig a hole then we took the stones out of the hole then we put the leaves in the hole then we put soil then we put the organic substances and then put soil and level it and then after water.*

Learner 2: *Dig a hole, put leaves, add organic substances three times, put soil on the organic substances three times and add water.*

Learner 3: *First you dig a hole than put in leaves then put organic substances and put sand then you put organic substances put sand put organic substances put sand than put water.*

Teacher: *Is hers correct?*

Learners: *No teacher.*

Teacher: *What is wrong with hers?*

Learner: *She didn't put the leaves again.*

Teacher: *Now who can tell me, since you all named organic substances? Who can tell me what organic substances are?*

Learner: *They are rotten food. They are like potato, like old carrots and potatoes stuff.*

Teacher: *Old carrot stuff, what is that supposed to mean?*

Learner: *Organic substances are like, maybe there were potatoes and cabbage in the fridge too long or somewhere too long and then it started to get rotten and then we call it organic substances when we put it together.*

Teacher: *I'll give you two minutes to look in your dictionaries quickly. If one person has a dictionary in the class it is enough.*

The teacher told the learners to give feedback.

Learner: *Produced by or from living things for example organic matter are leaves, wood, grass, bones and manure.*

Teacher: *Why are they organic?*

Learner: *Produced without chemicals, fertilisers or pesticides.*

Without elaborating the teacher continued with the next activity which was to group the following into organic and non-organic substances (Styrofoam, newspaper, peaches, plastic bag, orange peel, crayon, leaves, tree branch, television, twigs). These substances were written on the chalk board. The learners were asked to draw two columns in their books. In the first column they wrote down the organic substances from the list and in the second column the non-organic substances.

Analysis of learners work is presented below.

During the analysis process the worksheets that were completed by the learners were analysed only qualitatively. From the informal worksheets that were done by the learners, the teacher only gave me ten learners' books. This made a quantitative analysis difficult because out of a class of 40, ten books are a very small number to get a clear idea of how well the whole class group understood the topic and how many of the learners could apply the content correctly of what was taught to them. This was done to determine how well the learners mastered the content of the series of lessons on the topic of waste management. The teacher did three worksheets with the learners. Two worksheets were done during the lesson and the third one was done after the lesson. Worksheet 1 – What is the difference between hazardous waste and municipal solid waste? Describe what is meant by the three R's: Reduce, re-use and recycle. What are the benefits of the three R's? Worksheet 2 – What effect does waste have on human life? What are the environmental effects? What waste management issues are involved? What can you do to protect your local environment? Worksheet 3 – Group organic and non-organic substances correctly.

No formal assessment was done with this class group. The teacher did some informal assessment activities during the lesson. This work was not marked and I could not clearly see what the outcome of the different informal worksheets was.

➤ Qualitative analysis of worksheets

- Planned lesson competency

What was looked at was what the basic competency of the lesson was to determine if the worksheets were designed according to the stated basic competencies. This was achieved because the questions in all the worksheets were about environmental factors affecting health negatively and positively and how the learners can contribute to environmental care (LFWT4).

- Whether the questions in the worksheets were in line with the content of the lesson

What was looked at was whether the questions were in line with the content of the lesson and this was also achieved. The questions the teacher asked were based on environmental factors, both negative and positive, and how the learners can contribute to environmental care (LFWT4).

- What learners found easy to answer

What was looked at was what the learners found easy to answer. What the learners found the easiest to answer in all the worksheets was to explain how to make a compost heap and also to draw what they had explained in writing (LFWT4).

- What the learners found most difficult to answer

What was looked at was what the learners found the most difficult to answer. The learners found the first and second worksheets the most difficult to answer. The learners had to acquire this information themselves from their parents (LFWT4). The learners mostly struggled with the explanation of: What is the difference between hazardous waste and municipal solid waste? One learner's answer to this question was: Hazardous waste is very dangerous and municipal waste is very good to keep your house clean. The reason why the learners struggled with the

answering of this question might have been that the teacher did not direct them as to where to find this information or give the information to them.

- Whether the learners were able to apply the content knowledge that was required during the lesson according to their context

What I saw was that the learners related learning to their own situation by making a compost heap with waste they had brought from home. They had to collect information from their local environment to obtain an understanding about the concern which was about environmental care based on waste management which was addressed by the question (Worksheet 2): What can we do to protect our local environment? (LFWT4).

GRADE 4: PLATES 13-15

PLATE 13

10 July 2012
Waste is the useless material, substances or parts that are left after you have used something.

Photograph 30: Learners work. Information copied from chalk board.

• Worksheet

1. What is the difference between hazardous waste and municipal solid waste?
Hazardous waste threatens human health or the environment if it is carelessly thrown away or dumped onto the ground while municipal solid waste is commonly known as trash or garbage created by the community.
2. Describe what is meant by the three Rs:
Reduce, reuse and recycle.
Reduce: to make sth less or smaller in size, quantity, price, etc.
Reuse: to use something again.
Recycle: to treat things that have already been used so that they can be used again.
3. What are the benefits of the three Rs?
They help to maintain a clean environment. They extend the finite resources and they also contribute to sustainable development.

Photograph 31: Learner's work explaining the difference between different wastes.

11 July 2012
Hazardous waste
= is waste that poses substantial or potential threats to public health or environment
- characteristics of hazardous waste:
ignitability (i.e. flammable)
reactivity
corrosivity
toxicity
Municipal solid waste
= is commonly known as trash/garbage and it consists of everyday items that are discarded by the public.

Photograph 32: Learners work. Information copied from chalk board about hazardous waste.

PLATE 14

3. THE 3RS – REDUCE, REUSE, RECYCLE

Garbage is a growing problem for today's society. Each year we recycle more, but we also create more garbage. It is a problem we all help to create, but we can all play a part in reducing the mountain of garbage. With a little more thought we can all change our habits so that each one of us throws out less garbage. These small, but worthwhile changes may at first seem inconvenient, but soon they will become second nature.

The benefits of minimising waste

Some of the key benefits of minimising waste are:

1. It conserves valuable resources including:
 - Minerals – used to make many useful materials (e.g. bauxite is used to make aluminium).
 - Energy – used in mining, harvesting, manufacturing and transporting.
 - Native forests – used to make some types of paper and other wood products.
 - Petroleum – used to make plastics.
 - Landfill sites – the life of existing sites is extended.
2. It saves money. Cutting waste can save money in many different ways:
 - If you waste less, you get more out of what you buy and waste disposal costs are reduced.
 - Businesses become more efficient.
 - Household incomes stretch further.
3. It reduces the impact on the environment.
 - Fewer areas need to be affected by resource extraction (e.g. mining), harvesting or solid waste disposal.
 - Less fossil fuel needs to be burnt for energy, thus reducing the release of greenhouse gases and other pollutants.

The 3Rs

The 3Rs are a simple guide to help each of us minimise waste at work, school and home. Combine the 3Rs with composting and we have a neat package to help us deal with our waste. In minimising waste, remember to first 'reduce', then 'reuse', and finally 'recycle' what is left.

Reduce



Reduce simply means living more carefully so that you have less rubbish to get rid of later on. This could mean:

- Shopping more carefully by looking for products with minimal packaging.
- Making foods at home instead of buying takeaways or convenience foods.
- Making gifts and cards for family and friends, rather than buying them.
- Growing your own vegetables and flowers.
- Maintaining and repairing clothes, toys, tools and appliances rather than replacing them with new ones.
- Looking after items so they last a long time.
- Using disposables carefully so that you do not waste them.
- Hiring, sharing and borrowing things rather than buying new ones where possible.

When shopping, try the following ideas to help reduce unwanted garbage:

- Take a bag, basket or box with you when you shop.
- Use a shopping list. Try not to buy things on impulse. Buy only what you really need.
- Avoid goods that have excessive packaging.
- Choose products that come in concentrated form (e.g. kitchen detergent) or that have refills (e.g. certain ballpoint pens, some laundry detergents).
- When you buy packaged goods, choose packaging that is either made from recycled materials or that can be refilled, reused or recycled.
- Buy products made from recycled materials (e.g. paper, compost bins).
- Buy products that are durable and will last you a long time.
- Buy products that will not go out of fashion quickly and that can be repaired.
- Buy fresh foods where possible and compost the scraps.
- If possible, buy some food from bulk stores or markets. Take your own bags to be refilled.
- Where there is a range of sizes available, choose the largest that you can use.

Reuse



Reusing means to use the same item more than once, preferably many times, rather than disposing of it after one use. Reusing saves the energy and resources that would have been used to make a new product and means that the product does not go in the bin and end up in landfill.

There are lots of ways that you can reuse things around the home. Here are a few ideas:

- Reuse empty glass jars for jams and sauces.
- Take a basket or cloth bag with you when shopping.
- Hire, share or borrow items you do not use very often.
- Open envelopes carefully so that they can be reused.
- Use small, empty plastic soft drink bottles as drink bottles for school or outings.
- Buy second-hand books for school and pleasure.
- If you have too much junk around the house, arrange a garage sale and allow others to reuse your junk.
- Save your old margarine and icecream containers and egg cartons and donate them to a school or preschool.
- Buy reusable items rather than disposable ones (e.g. cloth hankies instead of paper tissues and rechargeable batteries instead of one-use batteries).

Recycle



Recycling means to return a waste product to a factory where it is remade into either the same product or something different. For example, used aluminium cans can be recycled back into either new drink cans or engine blocks for new vehicles. Recycling saves landfill space and also rescues the resources that were used to make the product in the first place. In some cases, recycling can also save energy.

Materials that can be collected from most homes for recycling include:

- Paper and cardboard
- All glass bottles and jars
- Aluminium cans and foil
- PET plastic soft drink bottles and fruit juice bottles (Code 1 – PET)
- Plastic milk, cream and juice bottles (Code 2 – HDPE)
- Steel cans
- Milk and juice cartons

Some councils also collect plastic juice bottles with Code 3 – Vinyl.

There is some variation from council to council in the materials collected for recycling. Check with your local council for details about which materials are collected for recycling in your area.

You should only place out for kerbside collection those materials that are collected by your council. If the wrong materials are placed out, the recyclables may become contaminated. Contamination threatens viability of the kerbside recycling system by increasing the costs to the collectors, the recyclers and ultimately the community.

Many more items can be recycled including:

- Plastic supermarket bags (collected at some supermarkets)
- Laser cartridges and ribbons
- Wine bottle corks
- Car parts (car bodies, batteries, tyres and motor oil)
- Building materials (timber, concrete, and bricks)
- Metals (lead, steel, copper and brass)
- Fire extinguishers (yellow, halon type).

Photograph 33: Hand out that was given on waste management.

PLATE 15

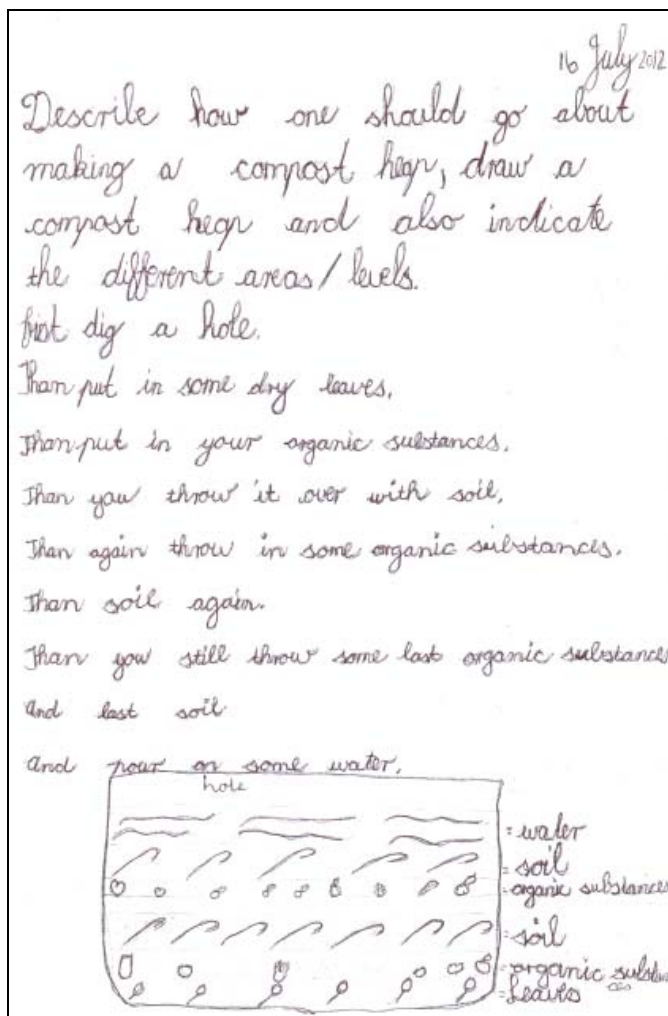
Worksheet:

1. What effect does waste have on the human life?
They can cause cancer and bronchitis and they can also cause death.
2. What are the environmental effects?
It causes animals to die especially in rivers or overfloods. cows & goats can make our water dirty.
3. What waste management issues are involved?
All waste must be handled carefully & burned.
4. What can you do to protect your local environment?
We can stop throwing rubbish around. factories should also stop with polluting the air and people must stop littering. we can also put posters to make people aware.



Photograph 34: Worksheet done by learners on the effects of waste.

Photograph 35: Teacher and learner digging a hole for the compost heap.



Photograph 36: Learners description and drawing of a compost heap.

4.4 TEACHERS' REFLECTIONS ON THE LESSONS PLANNED AND PRESENTED ACCORDING TO THE ACTIVE LEARNING FRAMEWORK

The data for this section were generated in the second focus-group discussion. The data were generated to establish teachers' engagement with the active learning framework after lesson implementations planned and presented according to this framework. Two main points emerged from this focus-group discussion and are presented below.

4.4.1 General views on the implementation of the active learning framework

All four teachers reflected that the learners learnt something from the lessons. They also reflected that the lessons provided the learners with the opportunity to be active in the teaching and learning process (FG2T1, pp. 2-4; FG2T2, pp. 4-5; I2T3, p. 1; FG2AP, pp. 5-6). Teacher 1 reflected that she did not feel confident when she presented her lessons according to the framework (FG2T1, pp. 2-4). Teacher 2, 3 and 4 reflected that it was a good lesson, a good idea to use for planning and presenting lessons and that it can work with more practice (FG2T2, pp. 4-5; I2T3, p. 1; FG2AP, pp. 5-6). Three teachers also reflected that presenting lessons according to the active learning framework is time-consuming (FG2T1, pp. 2-4; FG2T2, pp. 4-5; FG2AP, pp. 5-6). Elaborating on these points, the teachers' views are presented below:

Teacher 1 thought that the lesson went well as the learners came back with information from home about how they save water. However, the teacher felt that the lesson did not flow. However, she furthermore reported that even though she felt this way she thought that *"learners learnt something from it. They understood and they really came up with suggestions on how to save water"*. A positive outcome was that she did not think that learners would come with such a good solution, namely to put up water saving signs at every tap at school. She admitted that she had expected inappropriate answers. She also mentioned that the time was very limited (FG2T1, pp. 2-4).

Teacher 2 said that it was a very good thing to get the learners actively involved in the lesson. The learners were really actively involved because they could *"really seek for information and they could come and report back. I could see that they are really learning to take action because they were active. They took it as something of their own. It is just not school work but it*

is an issue in life that I need to look at and what do I see and what can I do about it” (FG2T2, pp. 4-5).

Teacher 3 stated that active learning is a good approach because it allows learners to be more active in class rather than being passive. She further noted that *“when you are active you learn more than when you are passive” (I2T3, p. 1).*

“My personal experience was that the learners really enjoyed it and were very excited. Each and every learner wanted to report back on information they had gathered. Furthermore, I think active learning can work, if planned according to the active learning framework. We just need to get use to the idea and with practice it definitely will be a great approach to teaching and learning” (FG2AP, pp. 5-6).

4.4.2 Challenges encountered during lesson planning and presentation

All the teachers said that they had included and covered all the areas of the active learning framework (FG2T1, pp. 9-10; FG2T2 and FG2AP, pp. 18-19; I2T3, p. 2; FG2AP, p. 11). All the teachers stated that they experienced challenges during the planning and presenting of lessons. The challenges experienced are elaborated on below.

Teacher 1 was uncertain on how to present the different dimensions in her lesson presentation (FG2T1, p. 6). Teacher 2 said that she had to think critically about the whole presentation in order to include all the dimensions of the framework and whether the learners will be able to take action on what she had planned for the topic (FG2T2, p. 18). Teacher 3 and 4 said that the difficult part was to find or create activities to mediate the lessons (I2T3, p. 1; FG2AP, p. 8).

Teacher 1 said that she must just get used to the idea and with practice she will become competent with the use of the active learning framework (FG2T1, pp. 19, 13-15). Teacher 2 said that she is comfortable with the use of the active learning framework, but a larger time frame is needed for the information process (I2T3, pp. 2, 3-4). Teacher 3 and 4 replied that they are comfortable with the use of the active learning framework and with practice they will overcome all difficulties (FG2T2, pp. 12, 20; FG2AP, pp. 12, 13).

4.3 CONCLUSION

The chapter presented the data that were analysed according to the question and Goals 1 and 2 of the study. After the first data generation process which was done by conducting individual interviews with the teachers, all the teachers involved in the study agreed to be part of the intervention process of this research project.

The data generation process was quite challenging for all of us as we had some difficulties. Some of us did not know what activities/worksheets to use and what learning support materials would assist with the mediation of presenting the topics to the learners. Furthermore one teacher was not so sure whether she was implementing all the dimensions of the framework as discussed in the training workshop that was conducted before the presentation of the different topics. However, all the teachers managed to include all the dimensions of the active learning framework and various active learning processes emerged during the lesson presentations, which was the main aim of the data generation process.

The data as presented in this chapter became the reference for the discussion in the upcoming chapter. In the next chapter the data will be discussed in relation to the education quality indicators as mentioned before.

CHAPTER 5

The education quality indicators and the use of the active learning framework

5.1 INTRODUCTION

This chapter discusses the key findings of the research process. In this chapter data representing the active learning processes that emerged from the use of the active learning framework (**Goal 2: to describe and explore active learning processes emerging from a teacher professional development intervention introducing teachers to an active learning framework**) are revisited in order to address Goal 3. The main aim of this chapter is to discuss Goal 3 of this study which is **to investigate how emergent active learning processes relate to education quality in the *Environmental Studies Curriculum***. The chapter concludes with a discussion of whether the active learning framework has the potential to improve the education quality of the teaching and learning process in the *Environmental Studies Curriculum* with the use of Nikel and Lowe's (2010) education quality indicators as reference.

5.2 THE RELATIONSHIP BETWEEN EMERGENT ACTIVE LEARNING PROCESSES AND EDUCATION QUALITY INDICATORS

In this section the active learning processes that emerged from the research intervention are discussed in relation to Nikel and Lowe's (2010) education quality indicators to address the third goal of the study, namely **to investigate how emergent active learning processes relate to education quality in the *Environmental Studies Curriculum***.

5.2.1 Effectiveness

All the teachers planned their lessons beforehand. Objectives and basic competencies were stated as the starting point for the lessons of the different topics that were presented for this study (Section 4.3). The objectives and basic competencies became the reference regarding meeting what is stipulated in the Namibian *Environmental Studies Curriculum*, and in addition the objectives as stipulated in the *Environmental Learning Curriculum Guidelines for*

Educators in order to consolidate the environmental perspectives of the lessons. This was done in order to explore Nikel and Lowe's highlighting of "effectiveness as the extent to which stated (educational) aims are met" (2010, p. 595, Section 2.7.1).

For the presentations of the Grade 1 environmental learning topic (Section 4.3.1) the objective of "Understand better how livelihoods are dependent on the environment" was met during the activity that was based on understanding humans' dependence on plants and animals for life. The next objective was to "Collect, classify, analyse and interpret data". This objective was met by asking learners to collect information based on what they eat daily by completing a questionnaire at home with the help of their parents. The teacher and learners classified this information in table form that was then presented in the form of a graph done by the teacher and they analysed and interpreted the data so that learners could realise how much food is consumed by humans daily. The following objective which was to "Understand what food and eating habits are necessary for their growth and health" was met by showing learners a poster and asking them questions about why we need to eat different food types, what food types are good for our bodies and what food types are not. The objective which was to "Encourage a sense of personal and social responsibility and a desire to work cooperatively with others on an environmental issue" was met by asking the learners what we can do to always have food and one learner replied that we can plant food. The last objective which was to "Organise, plan, implement and monitor an environmental project" was met during the "action taking" part of the lesson, where learners were taught how to plant carrot seeds and also to monitor the growth of the seeds (Section 4.3.1). The basic competency for the presentation of the topic to "Explain what healthy food is which should be eaten regularly, and healthy eating habits" was met by giving the learners two worksheets to complete at the end of entire presentation. However, not all the learners were able to achieve this basic competency, as some of the learners could not answer some of the questions correctly (Section 4.3.2). This shows that the basic competency for this topic was not fully achieved.

During the presentations of the Grade 2 topic (Section 4.3.2) the objective of "Understand the importance of conserving water as part of the ecocycle" was met by asking learners questions on why water is important and how to use water sparingly without wasting it. The next objective which was that "Learners should know why water must be used sparingly, what will happen if it is not, and where water can be stored in the home" was met by asking the learners

to find ways at home on how water can be saved and to report back on their water-saving ways in class (Section 4.3.2). The basic competency for the presentation of this topic was “Explain how and why water can be saved and stored”, which was done by giving the learners a worksheet to complete. For this worksheet the teacher only concentrated on **how** water can be saved and not **why**, which was also part of the basic competency, and thus shows that the basic competency for this topic was not fully achieved (Section 4.3.2).

During the presentation of the Grade 3 topic (Section 4.3.3) the objective that “Learners will be able to understand that traffic safety depends on correct behaviour and following safety codes on the road” was met by discussing different road signs with the learners and then the learners were asked to role play how to use the road correctly by acting as road signs, pedestrians and car drivers, and also by observing how car drivers and pedestrians use the road in front of the school and reporting back on this observation in class (Section 4.3.3). The basic competency for the presentation of this topic was to “Explain road safety and traffic rules for cyclists”. This was done by giving the learners a worksheet to complete in class. Although the basic competency was mostly based on road safety and traffic rules for cyclists, the teacher focused on traffic rules in general because of the traffic issue they experience outside the school in the mornings and afternoons and not really on traffic rules for cyclists. This shows that the basic competency for this topic was not fully achieved.

During the presentation of the Grade 4 topic (Section 4.3.4) the objective to “Develop understanding that a healthy environment is important for our basic needs, and develop a sense of care for the environment” was met by asking the learners what ways there are to reduce or to stop waste and the learners answered that we can put up posters to make people aware of the dangers of dirt, and provide educational programmes. The next objective was to “Encourage a sense of personal and social responsibility and a desire to work cooperatively with others on an environmental concern”. This was met by asking the learners how we can deal with waste and the learners answered that waste can be recycled or re-used. This information was also given to the learners in the form of a hand-out which clearly indicated what recycle, re-use and reduce mean. The objective of “To organise, plan, implement and monitor an environmental project” was met by teaching the learners in the form of a demonstration of how a compost heap is made (Section 4.3.5). The basic competencies for the presentation of this topic were “Distinguish between environmental factors affecting health negatively and positively and describe ways in which they can contribute to environmental care”. These basic competencies were met by

giving the learners worksheets during the presentations for the topic that was presented to this class group (Section 4.3.4). The lesson plans can also be considered from the extended view of effectiveness presented by Nikel and Lowe who argue that “a concern with initial conditions, the learners’ socio-economic backgrounds and their initial achievements – leads to a ‘value-added’ interpretation of effectiveness that [suggests], we measure the progress from a given starting point” (2010, p. 595, Section 2.7.1). A review of engagement with prior knowledge emphasises this concern.

The four teachers started their lessons by using the learners’ prior knowledge. They first asked the learners questions on the specific area of focus before moving to the unknown subject content (Section 4.3.1, 4.3.2, 4.3.3 and 4.3.4). The subject content for the Grade 1 learners was that they knew that we need food to survive or to stay alive, but what they did not know was that we get healthy and unhealthy food. The unknown subject content was taught to the learners by showing them a poster with different kinds of healthy food and the reasons why our bodies need these foods, and also that we can plant seeds in order to always have food (Section 4.3.1). The Grade 2 learners knew that we need water to survive and that we need to save it in order to have water all the time, but they did not know all the water-saving ways and shared the water-saving ways that they use at home with the rest of the class group. They also came up with the idea to make water-saving posters in order to save water at school (Section 4.3.2). The Grade 3 learners knew that there are traffic safety rules that need to be followed, but did not know all the traffic signs and why we need to obey them, or that we can seek help with our traffic problems from the traffic department (Section 4.3.3). The Grade 4 learners knew that waste is a problem for our health, but did not know that there are different ways how waste can be recycled, re-used and reduced. The unknown subject content that was taught to them was to learn how to build a compost heap in order to recycle waste (Section 4.3.4).

The stimulation of background knowledge occurred in the *information dimension* of the active learning framework with the use of group work activities and plenary discussions. As accentuated by Johnson, Johnson and Smith (1991), the use of cooperative learning requires the instructional use of small groups in order for students to work together to maximise their own and each other’s learning (Section 2.5). The teacher facilitated these group work activities by giving the learners questions to answer and these questions stimulated discussion (dialogue) (Wals, 2007, Section 2.5.3) in order to socially construct the meaning of the environmental

problem/issue/risk/concern that they were focusing on. The Grade 1, 2 and 3 class groups had plenary discussions, whereas the Grade 4 class group made use of smaller groups (Section 4.3.1-4.3.4).

A further measure of effectiveness will be drawn from the analysis of formative as well as summative assessment activities (Section 4.3) in order to determine to which extent the effectiveness of stated (educational) aims were met (Nikel & Lowe, 2010, Section 2.7.1).

The formative assessment activities that were done with the learners were *enquiry encounters* (Section 4.3) in the environment in order to involve learners actively with the systematic collection of data for the purpose of understanding environmental issues (Tudor & Ferguson, 2007, Section 2.5.2). These investigations were designed to answer an investigative question/s through the collection of evidence and the communication of results which added to the knowledge of identifying environmental trends and issues (Tudor & Ferguson, 2007, Section 2.5.2). Furthermore it helped learners to become system thinkers, learning skills of enquiry and understanding that knowledge does not only happen in the classroom (Tudor & Ferguson, 2007). For example, the Grade 1 learners obtained skills on how to answer a questionnaire and also to think about what they eat daily. The Grade 2 learners obtained skills of data collection, namely to find out how water is saved at home with the help of their parents. The Grade 3 learners practised observation skills, where they were asked to observe how car drivers and pedestrians use the road outside the school with the help of their parents. The Grade 4 learners obtained investigative skills by completing a worksheet on the effects of waste on human life and the natural environment, which they had to complete at home with the help of their parents. The information as stated above represents learning of knowledge which was socially constructed (Wals, 2007, Section 2.5) with the help of their parents or more knowledgeable peers (Vygotsky, 1978, Section 2.5). Knowledge of learning was passed from family members to learners and from learners to learners (Lave & Wenger, 1991).

The summative assessment activities were based on short and long questions (Section 4.3). Examples of these can be found in Section 4.3.1, Plate 5: Photographs 15 and 16; Section 4.3.2, Plate 9: Photograph 23; and Section 4.3.3, Plate 13: Photograph 30. Overall the learners did very well in these summative assessment activities and most of them achieved a pass mark (**Appendix E: Grades 1-3 assessment results**). Although there was no reference against which to measure the results the teachers were quite impressed with how the learners performed during these active learning lesson presentations (Section 4.4.4).

A further measure of effectiveness that was explored in three of the cases in terms of unexpected/un-predetermined outcomes that were of significance, was that the teacher did not know beforehand what solutions the learners would come up with. In this regard the teacher gave the learners the opportunity to come up with a solution that all the learners agreed upon. This notion can be regarded as an unexpected/un-predetermined outcome which we may fail to see, let alone measure (Nikel & Lowe, 2010, Section 2.7.1). However, for the Grade 4 class group the teacher had a pre-determined outcome in mind, which was to teach the learners how to make a compost heap where they had to construct the compost heap themselves with the guidance of the teacher. They also had to draw the processes of developing a compost heap in their exercise books. Most of the learners could do this perfectly well, while others struggled with the correct placement of the different layers (Section 4.3.4). The teacher discussed this activity with the learners afterwards in order to clear the confusion some of them had in this regard (Section 4.3.4).

5.2.2 Efficiency

Nikel and Lowe refer to one element of efficiency as the “ratio of outputs to inputs that economic considerations such as the maximising of resource use enters the interpretation of the quality of education” (2010, p. 596, Section 2.7). In this study the amount of time, effort, financial and other resources became the reference of how efficiently these lessons were presented by the teachers and received by the learners.

The topics that were taught to the Grade 1-4 learners had several activities which were mediated with the use of different resources (learning support materials). These learning support materials were efficiently used to guide learners to understand the new learning content and to guide them to solutions for the issues that they were focusing on (Sections 4.3.1, 4.3.2, 4.3.3 and 4.3.4).

During the teaching and learning processes organised for Grades 1 and 2 not all the learners were able to give their feedback from enquiries about issues. This means that time became a constraint in the activities. This influences the quality of education and environmental education in particular as all learners ought to get a chance to give their input in the teaching and learning processes. For example, in one of my Grade 1 lessons the report back of the enquiry took up a lot of time and I came up with another activity that was less time-consuming

in order to enable everyone to share the information of the enquiry done about the issue (Section 4.3.1). This was also the case with the Grade 2 teacher who had to read the information that the learners brought from their local context herself as some learners read very slowly and others struggled to read some of the words on their papers (Section 4.3.2). Furthermore, not all the learners got a chance to share the information that they had to collect at home, which was how they save water at home, with the rest of the class (Section 4.3.2). This means that the effort of all the learners who could not present their information was affected by the time constraint. However, the teacher asked the learners while the others were presenting their information, if there were learners who had different water-saving ways to share with the rest of the class. All the learners replied that their water-saving ways had already been given by the other learners. This illustrates that even though there are time challenges, teachers are able to come up with creative ways of working within them.

In these active teaching and learning processes the learners made enquiries in their local area. These enquiries involved the learners' families, as they collected this information by starting at their homes. The Grade 1 learners needed their family's help to complete the questionnaire they had to fill in at home (Section 4.3.1), the Grade 2 learners needed their family members' input as to how water is saved at home (Section 4.3.2), the Grade 3 learners needed their family's help to make observations about how car drivers and pedestrians use the parking area in front of the school (Section 4.3.3) and the Grade 4 learners who had to collect waste materials at home also needed their family's assistance as to what they could take to school as waste (Section 4.3.4). All the abovementioned is referred to by Nikel and Lowe as "the relation to the participation of individuals in education, both pupils ([and] their families) and teachers" (2010, p. 596, Section 2.7). This relates to efficiency as stated above that in all these cases the family (parents) became a valuable source of information to give the learners more input into the content of the topic or the issues that were investigated.

Taking cognisance of Nikel and Lowe's extended view of efficiency, another factor that played an important role in the efficiency of the active teaching and learning processes was whether the content of the teaching and learning processes would be worthwhile to learners, parents and teachers. According to the Grade 3 teacher the learners found the teaching and learning process worthwhile as they took it as something of their own, as if they were personally assigned to get this information as a daily life experience, as a necessity of life. To

be active was not like school work for them, but it was an issue in life that they needed to look at, what they saw around them and what they could do about it.

5.2.3 Equity

In this study heed was taken of gender stereotyping and gender equity with the planning and presenting of lessons according to the active learning framework. All the learners were treated equally during all the processes in the sense that they were all included in the processes of information seeking, enquiry encounters in a local area, reporting ideas and action taking (Section 4.3). No exception was made regarding learners' gender or ethnicity (Nikel and Lowe, 2010, Section 2.7), and no gender stereotyping (Namibia. MBEC, 2005a) was evident, nor were they treated differently on the basis of wealth, disability, race or HIV/Aids status (Ankomah, Koomson, Bosu & Oduro, 2005, Section 2.7).

In all the grades all the questions were posed to the whole class and any of the learners could answer them. All the learners were also asked to do the enquiries at home or to find information at home with the help of their parents/family. Reporting back sessions were done either individually or as a plenary discussion in which all learners could participate. In the solution-finding sessions all learners could participate as the teacher asked the whole class to think about a solution to the issue that they were working on. In the specific grade groups no one was excluded from these conversations. All the learners were also part of the action-taking sessions in all four the class groups.

This study provided opportunities for learners to socially interact with each other, their families and the community, through shared group characteristics irrespective of their gender, ethnicity, HIV/Aids status and situations of emergency and economical, political and social equalities (Nikel & Lowe, 2010, Section 2.7.3). The learners who took part in the study were included in the lessons through information seeking and enquiry. However, not all learners got a fair chance at first of reporting on the enquiries that they had to do outside of the classroom context because of the limited time they had, as discussed earlier, but they still participated by listening to their peers' presentations.

In this study Nikel and Lowe's extended interpretation of equity in education was also considered. That is education as a potential source of social transformation, and with a concern

for social justice, in order to address economic, political and social inequalities (Nikel & Lowe, 2010, Section, 2.7.3).

Social and economic inequalities were highlighted in the Grade 1 classroom when it became apparent that most of the learners did not maintain a balanced diet. That is because many of them did not indicate that they eat fruit and vegetables which actually protect the body from becoming sick. Even though it was not possible to address the underlying root cause of this problem, namely the impoverished conditions in which many of the learners live, the lesson was able to raise the possibility of self-sufficiency in food production by introducing the learners to the activity of planting their own carrots to supplement their diet.

The content of the topic “Water: the most important resource”, taught the learners that water is a precious natural resource and in order to have water all the time we should sustain it, irrespective of whether we can afford it or not. They also learnt that the less water they use, the less money they would have to pay for water usage and that water is also sustained in this way. The learners were taught different ways of how to save water and not to waste it unnecessarily. All the learners were involved in the project of how to come up with ways of how to save water in order to teach it to the rest of the school. These ideas were put up in the girls’ and boys’ toilets in the form of posters as mentioned earlier.

The content of topic “Traffic safety: safety on the road”, taught the learners different traffic safety rules in order to be safe on the road all the time and the issue of their rights to safety were raised. The learners were directly involved in trying to get their parents and the traffic department to help solve the traffic problems they experience outside the school. However, the complexity of this problem was highlighted when it emerged in classroom discussions that learners’ attempts to inform their parents of the rules did not bring the expected reaction. This possibly indicates a difficulty that young children have because they lack the power to confront people directly responsible for issues that affect them (the learners).

In the topic “Environmental care: a healthy environment – waste management”, the content taught the learners more about the effects of waste on human life and the natural environment. During these active teaching and learning processes the learners were taught how to make a compost heap in order to manage waste. This activity also made them competent enough to produce their own compost to fertilise soil instead of buying compost, and showed them that they were actually also reducing waste by recycling it for the production of compost (fertiliser).

5.2.4 Responsiveness

In these active teaching and learning processes the teachers either shared the information with the learners by using different activities together with different learning support materials to mediate the content of the lesson in order to get learners to actively learn during the lessons (Section 4.3.1; 4.3.2; 4.3.3 and 4.3.4) or they asked the learners to find the information in their local context (Section 4.3.1, 4.3.2, 4.3.3 and 4.3.4) in order to respond to the issue. The information processes allowed the learners to engage with the issue that was focused on in the lesson, which encouraged them to enquire about it in their local context (Section 4.3.1, 4.3.2, 4.3.3 and 4.3.4).

This process focused on individual diversity and difference in learning environments, learning abilities and styles (Nikel & Lowe, 2010, Section 7.2). In this process the learner as an individual person was put together with different other learners to focus on one issue, which means the learners experienced the issue differently as they live in different environments. The Grade 1 learners, for instance, all had different eating habits. Not one learner's eating habit was the same as that of any other learner. One thing that stood out was that most learners did not eat vegetables, which is an important food type to eat as it protects the body from becoming sick (Section 4.3.1). The Grade 2 learners' water-saving ways differed from individual to individual. For example, some learners' parents prefer washing clothes with their hands in order to save water, while others still prefer using a washing machine and then try to save in other areas such as washing the car by using a bucket instead of a hosepipe (Section 4.3.2). The Grade 3 learners each had a different story to tell from what they observed outside the school regarding how car drivers and pedestrians use the road (Section 4.3.3). The Grade 4 learners gave different ways of how waste can be dealt with. However, the teacher had a pre-determined action in mind, namely to teach the learners how a compost heap is made in response to waste management issues (Section 4.3.4).

Involving learners in the issues (Section 4.3) allowed them to connect with their own prior experiences and backgrounds which, in turn, motivated them to address the issue and thus made them key actors in response to the issue, increasing their sense of purpose (Wals, 2007, Section 2.7). This gave the learners the opportunity to respond to environmental changes that might affect individual ability and willingness to engage in responding to environmental issues (Nikel & Lowe, 2010, Section 2.7.4).

5.2.5 Relevance

The environmental issues that were focused on came directly from the learners' own life worlds, which enabled them to make meaning of the environmental issue that was focused on in the lessons (Section 4.3.1, 4.3.2, 4.3.3 and 4.3.4).

One of the focus points of the *Environmental Studies Curriculum* is to contextualise curriculum content (Namibia. MBEC, 2005a; Hogan, 2008, Section 1.4). By doing this the life worlds of the learners are seen as valuable and parents will also be able to see what learners are learning and if it is applicable to what they need as important life skills. In this study the teachers concentrated on issues that came directly from the *Environmental Studies Curriculum*. The learners were asked to enquire about a specific issue in their life under the following headings from the curriculum: Nutrition for Grade 1 with the focus on healthy and unhealthy food (Section 4.3.1), water for Grade 2 with the focus on saving water (Section 4.3.2), traffic safety for Grade 3 in order to be safe on the road (Section 4.3.3) and waste management for Grade 4 with the focus on waste management issues (Section 4.3.4) (Wals & Van der Leij, 1997, Section 2.7).

In addition, what the learners learnt from these topics is actually an important part of life skills. For example, everybody should know which foods are healthy and which are unhealthy for our bodies; everybody should also know how to save water as water is a valuable natural resource which people and the natural environment (animals and plants) are dependent on for survival; everybody should know that traffic signs are important for safety on the road and should therefore know and understand what they mean in order to adhere to them; and waste management is an important issue which all people ought to learn about as waste that is not managed has a negative effect on people's health and the natural environment (Section 4.3.4).

This is highlighted in Section 2.7 by Nikel and Lowe (2010) where they state that "relevance of an education system/educational experience is the extent to which it addresses user needs, but the identification of needs is a complex and often contradictory process; needs may be expressed at various levels: individually, family, community, national and global" (2010, p. 597, Section 2.7.5). During these active teaching and learning processes needs were expressed at the level of the individual, the family and the community. In the teaching and learning processes relevance as stipulated above played out as follows: The Grade 1 learners looked at poor health as an issue of the topic and enquired about it by completing a questionnaire at home

with the help of their parents on how much food they consume and if what they eat is healthy or unhealthy. In this process the learners learnt more about how they can maintain a healthy diet in order to ensure a healthy body. Together with this they also looked at what food types they need to eat in order to maintain a healthy body and where we get these foods from. They also learnt that in order to stay alive we need food all the time, and therefore came to the realisation that we need to plant food, which was the solution they came up with and also practised by planting carrot seeds (Section 4.3.1).

The Grade 2 learners looked at the importance of water saving as an issue. The learners enquired about water-saving practices at home and came up with a solution as to how water could be saved at school. This was to put up water-saving signs in the girls' and boys' toilets at school in order to teach the rest of the learners how to save water as a natural resource (Section 4.3.1).

The Grade 3 learners looked at traffic safety as an issue. The learners observed how car drivers and pedestrians use the road in the parking area in front of the school. After the observation the learners reported back that many car drivers and pedestrians did not use the road safely and according to the traffic rules and regulations. They came up with a solution to this problem, namely to write a letter to the traffic department requesting them to solve the problem (Section 4.3.3).

The Grade 4 learners looked at waste management as an issue. They enquired in their local context in order to obtain an understanding of the negative effects of waste on people and the natural environment. They had to bring waste from home to school where they had to sort it into non-organic and organic substances in order to make a compost heap (Section 4.3.4).

In these teaching and learning processes (Grades 1-4) the individual (learner) and the family were seen as important, as the learners had to enquire about the issue at home in order to get the information. In this process of teaching and learning curriculum content was contextualised by asking the learners to link the subject content to their own context in order for content knowledge to become relevant to them (Namibia. MBEC, 2005a; Hogan, 2008, Section 1.4).

Experience of an issue might vary from local area to local area or it might be experienced in the same way. As Nikel and Lowe state: "... the needs expressed at different levels, and different groups within each level – rural or urban communities, socio-economic classes, and so on – and the outcomes of decisions about priorities will reflect contextually specific cultural and political

struggles” (2010, p. 597, Section 2.7). In this research study all learners experienced the issues that were focused on more or less in the same way (Section 4.3.1, 4.3.2, 4.3.3 and 4.3.4). However, in the case of the topic of traffic safety tension arose according to user needs, as some of the parents did not listen to learners asking them to follow the traffic safety rules and the traffic department did not respond to their request to assist them with the traffic problem in the parking area in front of the school. The parents might have felt that they did not need to listen to a child telling them how to drive on the road or follow traffic safety rules (Section 4.3.3).

5.2.6 Sustainability

Sustainability played out in the action-taking process of the presentations, namely that it was to do something *for* the environment (Fien, 1993). The actions that were taken *for* the environment were based on direct and indirect environmental actions for the environment (Jensen & Schnack, 2006, Section 2.6). The Grade 1, 2 and 4 learners’ actions were based on direct environmental actions as it was done to directly contribute to solving an identified environmental problem, while the Grade 3 learners’ action was based on an indirect environmental action which intended to influence others to do something to contribute to solving the environmental problem. All of these processes had some elements of transformative learning, which Nikel and Lowe (2010) describe as focusing on “behaviour change and acceptance of responsibility on which one must act, or participation by all stakeholders and parties in processes of goal-setting, decision-making and evaluation” (2010, 599, Section 2.7).

The Grade 1 learners learnt that in order to have food all the time we can plant seeds. They realised that food consumption by humans is very high because we have to eat to survive (or stay alive, for that matter). They decided to plant carrot seeds in order to sustain food products, as was mentioned previously (Section 4.3.1). However, for the presentation of this topic no crops were harvested as was planned by the learners and the teacher. The reason for this was that the crops died as they did not receive water for a whole month (Section 4.3.1). This negligence further highlighted the fact that plants need water in order to grow and live.

The Grade 2 learners decided to put up water-saving signs in order to save water, as mentioned earlier. However, this did not last long as the signs fell from the walls and were never put up again (Section 4.3.2). This suggests that sustainability for the presentation of this topic did not last long.

The Grade 3 learners wrote a letter to the traffic department in response to the traffic problem they experience in the parking area in front of the school, as previously mentioned. However, no follow-up was done when the traffic department did not respond to their letter (Section 4.3.3). This suggests that sustainability for the presentation of this topic did not play out as planned.

The Grade 4 learners compiled a compost heap as a response to waste management in order to reduce waste. However, the compost heap never matured as was planned by this class group (Section 4.3.4). This suggests that sustainability did not last for the presentation of this topic as was desired by this class group.

5.2.7 Reflexivity

All the learners became aware of the issue caused by the existence of human action and the conditions within which it takes place (Nikel & Lowe, 2010, Section 2.7), which was taught to them through the information-seeking and sharing dimension (Section 4.3). The learners' reflexivity was enhanced by enquiries that were done by them to get more information on the issue that they were focusing on to create awareness about the environmental issue in their context and to report back on what they had acquired (become aware of) (Section 4.3). These enquiries and reporting back processes allowed learners to engage with the situation of the issues and thus they came up with solutions on how to address them. In these active teaching and learning processes as highlighted by Nikel and Lowe (2010, Section 2.7) learners are orientated to reflect on and to understand human activity and context as a feedback loop. For example, the teachers asked the learners several questions to determine how well the lessons played out and whether they achieved what they aimed for in the presentations of the topics, which was to do something for the environment (Fien, 1993) from which they could also benefit. As stated by Wals, "social learning requires reflection and reflexivity throughout the entire process, if only to improve the quality of the process itself and to monitor change and progress throughout" (2007, p. 41, Section 2.7).

The Grade 1s decided to plant carrot seeds, which forms part of healthy foods and which is good for eyesight (Section 4.3.1). The learners felt good about the presentation of this topic and reported that everything went well. The Grade 2s put up water-saving signs in the boys' and girls' toilets in order to teach the other learners how to save water (Section 4.3.2). The Grade 3s

wrote a letter to the traffic department in order to solve the traffic problem they experience in the parking area in front of the school (Section 4.3.3). The Grade 4s made a compost heap of organic substances in order to reduce waste (Section 4.3.4).

5.3 CONCLUSION

This chapter has used Nikel and Lowe's (2010) fabric model of education quality to examine the emergent active learning processes in the four case studies detailed in Chapter 4. The contradictions and tensions regarding educational quality in the context of this case study are summarised below.

In exploring the dimension of effectiveness, this chapter established that the stated educational objectives (aims) were met through the active teaching and learning processes. The teachers did several activities in order to bring understanding to the content knowledge of the environmental issue that they focused on. These educational objectives (aims) were measured with formative and summative assessment activities. The outcomes of these activities were effective in the sense that the learners did very well in them as most of the learners achieved a pass mark. A further consideration with respect to effectiveness is to consider the value of unexpected outcomes in the learning process. To varying degrees the different activities lent themselves to allowing the learners to select and implement their own solutions to the problems identified. In these cases the teacher needed to be responsive to their ideas and suggestions.

In exploring the educational quality dimension of efficiency, this chapter presented lessons with a variety of different resources (learning support materials) which guided the learners in understanding the new learning content in order to come up with solutions to the issues they were focusing on. Another efficiency consideration, namely time, became a constraint in the activities, although teachers were able to come up with creative ways of working better within time constraints. A third aspect of efficiency was making use of parents who also became a source of information, for example concerning the environmental issues in their living environment. This chapter also highlighted an extended view of efficiency by highlighting evidence from the data which indicated that learners found the activities they were engaged in "worthwhile".

In exploring the education quality dimension of equity, this chapter showed that equity from the point of view of gender, race and class was not an issue of concern in the classroom. Regarding a further aspect of equity – social justice and transformation, the emerging active learning processes raised aspects of social injustice (food insecurity and lack of safety in the schools), however in other cases, the dominant discourse tended to focus on learners' responsibilities rather than their rights (in the case of waste and water use) and thus did not cover issues of social justice. A further tension that was raised in this chapter was the complex power relationships between young learners and their parents in dealing with issues of social justice beyond the power of the learners (for example their need for parents to obey traffic rules to ensure the safety of the learners in the school).

In considering responsiveness this chapter illustrated that the involvement of learners in addressing environmental issues allowed them to connect with their own prior experiences and backgrounds which, in turn, motivated them to address the issues and thus made them key actors in response to the issue, increasing their sense of purpose. The learners addressed the environmental issues by planting carrot seeds (Grade 1s), making water saving posters (Grade 2s), writing a letter to the traffic department (Grade 3s) and by building a compost heap (Grade 4s). This gave them a chance to respond to the environmental changes that might affect individual ability and willingness to engage in responding to environmental issues.

Considering relevance as another dimension of educational quality, this chapter illustrated that emergent active learning processes included environmental issues that were focused on the learners' own life worlds, which enabled them to make meaning of the environmental issue. In addition, learners learnt important life skills from these topics. These include knowing which foods are healthy and which foods are unhealthy for our bodies, how to save water, the importance of traffic signs for everybody's safety, and how to manage waste. During these active teaching and learning processes curriculum content was contextualised by asking the learners to link the subject content to their own context in order for content knowledge to become relevant to them.

In reflecting on the sustainability dimension of education quality, this chapter presents examples of both direct and indirect environmental actions. All these active teaching and learning processes had some elements of transformative learning, which Nickel and Lowe (2010) describe as focusing on "behaviour change and acceptance of responsibility on which one must

act, or participation by all stakeholders and parties in processes of goal-setting, decision-making and evaluation” (2010, 599, Section 2.7).

The sustainability of the activities was questionable as the Grade 1 learners were not able to harvest any crops because the crops died when they did not receive any water during the December holidays, the Grade 2 learners’ water saving signs fell off the walls and were never put up again, the Grade 3 learners’ letter to the traffic department was not responded to and the Grade 4 learners compiled a compost heap as a response to their issue but the compost heap never matured as was planned.

The final dimension of education quality considered in this chapter was that of reflexivity. The chapter illustrated evidence that all the learners had become aware of the issue caused by the existence of human action and the conditions within which it takes place (Nikel & Lowe, 2010, Section 2.7). The learners were also orientated to reflect on and to understand human activity and context as a feedback loop. For instance, the teachers asked the learners several questions to determine how well the lessons played out and whether they had achieved what they aimed for in the presentations of the topics, which was to do something for the environment (Fien, 1993) from which they could also benefit. As stated by Wals, “social learning requires reflection and reflexivity throughout the entire process, if only to improve the quality of the process itself and to monitor change and progress throughout” (2007, p. 41, Section 2.7).

CHAPTER 6

Summary of findings, limitations, reflections and recommendations of the study

6.1 Summary of findings

The key findings of this study relate to the third goal of the study which was **to investigate how emergent active learning processes relate to education quality in the *Environmental Studies Curriculum***. This section describes the active learning processes emerging from the use of O'Donoghue's (2001) active learning framework in relation to education quality as elaborated by Nikel and Lowe's (2010). Emergent active learning processes are discussed below under each dimension of Nikel and Lowe's (2010) extended view of education quality as elaborated in Section 2.7.

➤ *Effectiveness*

In considering the effectiveness of the active learning processes, this study included consideration of the stimulation of background knowledge (Nikel & Lowe, 2010). This occurred in all cases by using group work activities and plenary discussions as accentuated by Johnson, Johnson and Smith (1991). With the use of small groups students worked together to maximise their own and each other's learning. In the cases in this study group work activities were facilitated by the teachers by giving the learners questions to answer which stimulated discussion (dialogue) (Wals, 2007, Section 2.5.3) in order to support the construction of meaning of the environmental problem/issue/risk/concern that they focused on.

A further measure of effectiveness was drawn from the analysis of formative as well as summative assessment activities that emerged from enquiries done by learners. These enquiries were done to involve learners actively in the systematic collection of data for the purpose of understanding environmental issues (Tudor & Ferguson, 2007, Section 2.5.2). In addition, it helped learners to become system thinkers, learning skills of enquiry and

understanding that knowledge does not only happen in the classroom (ibid, 2007). For example, the learners obtained skills on how to answer a questionnaire, obtained skills of data collection by enquiring how water is saved at home, practised observation skills by observing how car drivers and pedestrians use the road and obtained investigative skills by completing a worksheet on the effects of waste on human life and the natural environment. The learners also performed well in the summative activities they had to complete, although there were a small number who could not answer most of these questions correctly.

Furthermore, unexpected/un-predetermined outcomes as an extended view of a measure of effectiveness (Nikel & Lowe, 2010) were also explored. In this regard the teachers of the Grade 1-3 class groups gave the learners the opportunity to come up with solutions themselves and these solutions were put into practice by the learners, thus demonstrating the potential of such active learning processes to accommodate and foster unexpected directions and outcomes. However, this was not the case for the Grade 4 class group as the teacher had a pre-determined action in mind that she wanted to teach the learners but was put into practice by the learners themselves with the teacher's guidance.

➤ *Efficiency*

The research illustrated that activities during lessons were efficiently mediated with the use of different resources (learning support materials) which were used to guide learners in understanding the unknown subject content. However, not all learners were able to give feedback on the enquiries that they had done at home. Even though time was a constraint, the teachers came up with creative ways in order to enable all learners to report back on the enquiries done by them.

This chapter also highlighted an extended view of efficiency by showing evidence from the data which indicated that learners found the activities they were engaged in “worthwhile”. This was evident, for example, in the teacher's belief that her lesson had been a success due to the exploration of “life's realities”, in other words, through exploring life's realities, learners appeared to find the learning activities to be “worthwhile”.

➤ *Equity*

In consideration of equity the study revealed that all the learners were able to participate during the presentations of the topics. All questions were asked to whole class groups and any of the learners could answer them. All learners were also included in the teaching and learning processes as all learners had to do enquiries at home. All learners took part in the plenary discussions and group work discussions; not one learner was excluded.

Furthermore, active teaching and learning processes promoted the extended view of equity which is highlighted by Nikel and Lowe (2010) as a potential source of social transformation and with a concern for social justice, and that education would be considered equitable to the extent that it mobilises the potential of education to address economic, political and social inequalities. Across the four lessons issues of social justice were touched on with respect to food security, the effect of pollution on people's health and threats to children's safety with respect to traffic in the school. Due to the complexity of the root causes of these issues responses tended to focus on mitigation factors (such as planting one's own food) or personal responsibility (such as saving water, recycling and reducing). The lesson on traffic safety highlighted unequal power relationships in terms of young learners' capacity to influence their parents to obey traffic laws in the interests of the safety of learners at school.

➤ *Responsiveness*

In reflecting on responsiveness in the emergent active teaching and learning processes, the study focused on responsiveness to individual diversity and difference in learning environments, learning abilities and styles (Nikel & Lowe, 2010, Section 2.7). In these active teaching and learning processes the learner as an individual person was put together with different other learners to focus on one issue, which means the learners experienced the issue differently as they live in different environments. Involving learners in the issues allowed them to connect with their own prior experiences and backgrounds which, in turn, motivated them to address the issue and thus made them key actors in response to the issue, increasing their sense of purpose (Wals, 2007, Section 2.7). By linking to their own contexts, the learners' individual ability and willingness to engage in responding to

environmental issues was stimulated (Nikel & Lowe, 2010, Section 2.7.4). This was evident from learners' active engagement in decision-making to plant their own food, put up signs about water waste and to write to the traffic department regarding safety at school.

➤ *Relevance*

The study revealed evidence of the relevance of the emergent active learning processes as the content that was taught to the learners came directly from their own life worlds, thus enabling them to make meaning of the environmental foci in the lessons. During lessons needs were expressed at the level of the individual, the family and the community. The Grade 1 learners looked at poor health as an issue and enquired about it by completing a questionnaire at home with the help of their parents on how much food they consume daily and if what they eat, is healthy or unhealthy. The Grade 2 learners looked at the importance of water saving as an issue and enquired about water saving practices at home. They came up with a solution as to how water could be saved at school. The Grade 3 learners looked at traffic safety as an issue and observed how car drivers and pedestrians use the parking area in front of the school. The Grade 4 learners looked at waste management as an issue and enquired about the negative effects of waste on human life and the natural environment in their own context. They collected waste from home in order to address the issue by building a compost heap.

➤ *Sustainability*

Sustainability was another dimension of education quality explored in this study. The Grade 1, 2 and 4 learners' actions were based on direct environmental actions aimed at directly solving identified environmental problems, while the Grade 3 learners' action was based on an indirect environmental action which intended to influence others to do something to contribute to solving the environmental problem. All these processes had some elements of transformative learning, which Nikel and Lowe (2010) describe as focusing on "behaviour change and acceptance on which one must act, or participation by all stakeholders and parties in processes of goal-setting, decision-making and evaluation" (2010, p. 599, Section 2.7). Although the actions were put into practice, the actions that were focused on were not

sustained due to several reasons as stated in Section 5.2.7. However, with more careful planning these stumbling blocks can be overcome.

➤ *Reflexivity*

The final education quality dimension considered in this study was reflexivity and learners' awareness of the environmental issue caused by the existence of human action and the conditions within which it takes place (Nikel & Lowe, 2010, Section 2.7). In these active teaching and learning processes as highlighted by Nikel and Lowe, (2010) (Section 2.7) learners were oriented to reflect on and to understand human activity and context as a feedback loop. The teachers asked the learners questions to determine how well the lessons had played out and whether they achieved what they aimed for in their environmental actions, which was to do something *for* the environment (Fien, 1993) from which they could also benefit. As stated by Wals, "social learning requires reflection and reflexivity throughout the entire process, if only to improve the quality of the process itself and to monitor change and progress throughout".

For this study it became evident that the use of the active learning framework (O'Donoghue, 2001) for lesson planning and presenting showed potential for eliciting quality education according to Nikel and Lowe's (2010) education quality indicators. Reflecting back on Nikel and Lowe's view of the different dimensions of model as creating a "'fabric' that is at its strongest when 'stretched' or maintained in tension" (2010, p. 594, Section 2.7), it is possible to see how activities aiming for **efficiency** in terms of "being worthwhile" to the learners, enabled creative and **relevant** learning processes to emerge from exploring environmental issues, and activities that are **responsive** to individual diversity and difference can increase **efficiency** in terms of education being more efficient and ensuring that a learner progresses from his own starting point and prior knowledge at the start of the learning process. Additionally, activities highlighting **reflexivity** might enable stronger **sustainability** in future environmental actions.

Also, sometimes an even tension appeared hard to maintain. For example, active learning activities with a concern for **relevance** to community needs might create challenges that are too complex or deep for learners to make **sustainable** interventions or compromise the **efficiency** of the learning because of the time constraints in conducting real-life enquiries. Otherwise activities aimed at **effectiveness** in terms of supporting the emergence of unintended outcomes

might actually create expectations beyond the capacity of young learners, thus compromising the **efficiency** of the learning process.

Influenced by considerations of **equity**, further lessons could emphasise rights as much as responsibilities (in order to address an extended vision of equity in education). Other potential methods for strengthening quality could be finding ways of ensuring the **sustainability** of direct environmental actions and ways of dealing with power relationships that arise in the case of indirect actions.

6.2 Limitations of the study and reflections on the research process

This section reflects on the limitations of the research process as a whole. Teaching more environmental topics during the intervention process would have given the teachers who were involved in the study more practice with the use of the active learning framework as at least one teacher did not really feel confident with the use of the active learning framework.

Data generation could also have been improved by capturing observations through video recordings. Video recordings would have been more helpful with the writing of the mini-case stories, rather than the notes taken from observations and the accompanying photographs.

Another element that would also have been helpful to the teachers would have been to extend the intervention to include a workshop on different active learning teaching methods. This would have been helpful to the teachers with the planning and presentation of lessons. All the teachers also found it challenging to develop suitable learning support materials and worksheets for the topics that we taught. Nevertheless, all the teachers involved in this study found this intervention process purposeful, learningful and insightful. Although none of us had used the active learning framework as tool for teaching and learning before in our teaching professions, this study showed that the intervention using this framework was a success in the end.

6.3 Recommendations emerging from the study

Recommendation (1): The active learning framework can be used as a tool for lesson planning and presentation. It is valuable for environmental learning lessons in the sense that it is easy to follow. The teachers who took part in this study stated that it is a good tool for lesson planning and presentation. It guides the teachers exactly on what needs to be done when, from the identification of the issue until the action-taking process to address/respond to the issue.

Recommendation (2): In the *reporting dimension* of the active learning framework time was an efficiency constraint in terms of education quality. However, the teachers came up with creative ways on how to include all learners in reporting back on the information that they had enquired about at home. Thus a recommendation from this study is to further explore more efficient ways of conducting local enquiries in active learning processes.

Recommendation (3): In the *action dimension* the actions that were put into practice did not last long. This was because no one monitored the actions. From this, we learned that in future we should monitor the actions in order to strengthen the sustainability dimension of education quality in active learning processes. Thus it is recommended that reflexivity should be a very important education quality aspect to be taken into consideration at all times during the teaching and learning process.

Recommendation (4): The following education quality indicators of Nikel and Lowe (2010) can be used for monitoring and evaluating the active teaching and learning processes. These education quality indicators were slightly adapted according to the Namibian curriculum context to bring about a clear understanding. They are stipulated below:

❖ Effectiveness

- Were all the objectives reached as prescribed by the curriculum and how was this achieved?
- Were the outcomes negative or positive? If negative, how did you overcome it if it was possible to overcome it?
- What other valuable information, knowledge and skills emerged during the teaching and learning processes that were not stated beforehand in the objectives and basic competencies?

❖ **Efficiency**

- Was the lesson content knowledge of any value to the learners?
- Did resources and individuals that were used add value to the content knowledge?
How did it/they add value?
- Was the amount of time, effort, financial or other resources invested by these individuals worthwhile to them?
- Were the activities considered to be worthwhile to the learners and their parents/communities?

❖ **Equity**

- Were all the learners respected and treated equally and fairly?
- Were gender inequalities, disability, race and ethnicity, location and poverty among students addressed?
- Were economic, political and social inequalities addressed during the teaching and learning process?

❖ **Responsiveness**

- Did the lesson allow all the learners to individually respond to the lesson?
- Did the lesson focus on individual diversity and difference in learning environments, learning abilities and styles, but also on responding to environmental changes that might affect individual learning ability and willingness to engage?
- Did the lesson acknowledge aspects of personal growth and the social nature of this process with a concern for the learner “becoming himself” through the teaching and learning processes? For example, were the learners able to orientate and explore the issues as key actors as a concern or key challenge to address the issue in a way that connects with their own prior experiences and background, thereby increasing their motivation and sense of purpose?

❖ **Relevance**

- Was the content of the lesson relevant to the learners’ own context to the extent to which it addressed user needs?

- Was the identification of needs addressed according to various levels: individually, family, community, nationally and globally, based on rural and urban communities and socio-economic classes, which will reflect contextually specific cultural and political struggles?

❖ **Reflexivity**

- Was there evidence of representing the increased awareness of the existence of a feedback loop embracing human action and the conditions within which it takes place?
- Was reflexivity captured as a concern that is shared with all in engaging with an uncertain future which requires reflection and reflexivity throughout the entire social learning process, in order to improve the quality of the process itself and to monitor change and progress throughout?

❖ **Sustainability**

- Was sustainability promoted and achieved in the lesson?
- Did sustainability represent a concern over the contribution of education for individuals, communities and nations by taking up responsibility for global environmental changes and the uncertainty over the well-being of future generations?
- Was the educational approach transmissive or transformative?
- Was sustainability considered as the scope of educational impact and responsibility in terms of temporal scale (beyond one generation) and geographical scale (recognising the limitations of natural resources of nature as well as aiming to integrate decision making, linking the local with the global)?

Recommendation (6): As some of the basic competencies in this study were not totally achieved during the use of the active learning framework, I recommend learner support teaching in order to increase efficiency in bringing about understanding of the content knowledge that was not mastered. Learner support teaching that is referred to here is when the learners are given extra lessons after school in order to assist them with understanding content knowledge that they did not understand during the actual lesson presentations.

6.4 Further research

An area for further research would be to introduce this framework to student teachers at the University of Namibia to use as a tool for planning environmental topics and implementing it at different schools in order to obtain a broader understanding of the use thereof.

6.5 Concluding comments

Nikel and Lowe's educational quality indicators were effective in reviewing the active learning framework as a tool for lesson planning. This different perspective on the active learning framework illustrated the potential of this framework for addressing environmental issues at Primary School level (Foundation Phase).

Nikel and Lowe's educational quality indicators also broadened my knowledge on what quality education entails, highlighting the many areas that need to be taken into consideration when planning and presenting content knowledge to learners. For instance, reflexivity during and at the end of the presentation of a topic is very important in order to sustain the actions taken for the environment. In this regard the actions that were taken were not sustained because no follow-ups were done in order to sustain the actions that were taken (Section 5.3.6).

Finally, working on this thesis was really exciting and worth my while as I learned a lot, not only about educational quality as a concern, but also about the field of environmental education as a whole, the curriculum as a guide to teaching and learning, the use of differently situated learning aspects and the interaction with my colleagues on this project. Furthermore, the active learning framework as a guide to environmental teaching and learning has become an important tool for me in planning and presenting environmental topics and the education quality indicators have become a regular reference in my everyday teaching.

REFERENCES

- Anderson, J. R., Reder, L. M., & Simon, H. A. (1996). Situated Learning and Education. *Educational Researcher*, 25(4), 5-11.
- Anderson, V. (2009). *Research methods in human research management*. (2nded). London: Chartered Institute of Personnel and Development.
- Ankomah, Y. A., Koomson, J. A., Bosu, R. S., & Oduro, G. K. T., (2005). *A review of the concept of quality in education: Perspectives from Ghana*. EdQual Research Programme Consortium for implementing Education Quality in the Low income Countries. Ghana: University of Cape Coast.
- Barret, M. J. (2006). Education for the environment: Action competence, becoming and story. *Environmental Education Research*, 13(2), 209-223.
- Bassey, M. (1995). *Creating education through research: A global perspective of educational research for the 21st century*. Newark: Kirklington Moor Press. BERA (British Educational Research Association). Ethical guidelines. Retrieved February, 2006 from <http://www.bera.ac.uk/guidelines/html>
- Beck, U. (1991). *Risk Society: Toward a New Modernity*. Sage: London.
- Bell, J. (1993). *Doing your research project: A guide for first-time researchers in education and Social Science*. (2nded.). Buckingham: Open University Press.
- Berk, L. E., & Winsler, A. (1995). *Scaffolding children's learning: Vygotsky and early childhood education*. Washington, DC: National Association for the Education of Young Children.
- Berkes, F., Folke, C., & Colding, J. (2003). *Navigating social-ecological systems: Building resilience for complexity and change*. Cambridge: Cambridge University Press.
- Best, J. W., & Kahn, J. V. (2006). *Research in Education*. (10thed.). United States of America: Pearson Education Inc.
- Bonwell, C. C., & Eison, J. A. (1991). *Active learning: Creating excitement in the classroom*. Washington University: Washington DC.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated Cognition and the Culture of Learning. *Educational Researcher*, 15(1), 32-42.
- Buarque, C., Spolar, V. A. M., & Zhang, T. (2006). Introduction: Education and poverty reduction. *Review of Education*, 52, 219-29.
- Castle, E. B. (1956). *Principles of education for teachers in Africa*. Oxford: Oxford University Press.

- Chatzifotiou, A. (2005). National policy, local awareness: implementing environmental education in the primary schools of northern Greece. *Environmental education research*, 11(5), 503-523.
- Cohen, L. Manion, M., & Morrison, K. (2010). *Research Methods in Education*. (6thed.). New York: Routledge.
- Costley, C., & Gibbs, P. (2006). Researching others: care as an ethic for practitioner researchers. *Studies in Higher Education*, 31(1), 89-98.
- Dadder, A., Baltodano, M., & Torries, D. (2003). *The critical pedagogy reader*. New York: Routledge Farmer.
- Danemark, B., Ekstrom, M., Jakobssen, L., & Karlsson, J. (2002). *Explaining society. Critical realism in the social sciences*. London: Routledge. Environmental Education and Information Services Unit.
- Daniels, H. (2004). *Vygotsky and pedagogy*. London: Routledge/Falmer.
- Dillenbourg, P. (1999). What do you mean by collaborative learning?. In P. Dillenbourg (Ed) *Collaborative-learning: Cognitive and Computational Approaches* (pp. 1-19). Oxford: Elsevier.
- Eaves, C. (2006). *Improving pedagogical approaches in environmental education that promotes action competence*. Wellington: Crown.
- Fakir, S. 2002. Poverty and environment linkages in the context of the World Summit on Sustainable Development. In *The long walk to sustainability: A southern African perspective*, ed. E. Reynolds et al. Johannesburg: HIS South Africa.
- Fien, J. (1993). *Education for the environment: Critical curriculum theorising and environmental education*. Geelong, Victoria: Deakin University Press.
- Filmer, D., Hasan, A., & Pritchett, L. (2006). A millennium learning goal: Measuring real progress in education. Working Paper No. 97, Centre for Global Development. <http://www.cgdev.org/content/publications/detail/9815>
- Fisher, R. (1990). *Teaching children to think*. London: Stanley Thornes.
- Hattingh, J. (2004). Speaking of sustainable development and values. A response to Alistair Chadwick's Viewpoint: Responding to destructive interpersonal interactions: A way forward for school-based environmental educators. *Southern African Journal of Environmental Education*, 21, 157-165.
- Hogan, R. (2008). Contextualization of formal education for improved relevance. A case of the Rufiji wetlands. Tanzania. *Southern African Journal of Environmental Education*, 25, 44-58.

- Horn, R. (2009). *Researching and writing dissertations: A complete guide for business and management students*. London: Chartered Institute of Personnel and Development.
- Jensen, B. B., & Schnack, K. (2006, July-September). The action competence approach in environmental education. *Environmental Education Research*, 12(3-4), 471-486.
- Johnson, D. W., Johnson, R. T., & Smith, K. A. (1991). *Cooperative Learning: Increasing College faculty instructional productivity*. Washington, D. C.: George Washington University Press.
- Lather, P. (1986). Research as praxis. *Harvard Education Review*, 56(3), 257-279.
- Lave, J., & Wenger, E., (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, England: Cambridge University Press.
- Leach, L., & Moon, B. (2008). *The power of pedagogy*. London: Sage.
- Leedy, P. D., & Ormrod, J. E. (2010). *Practical Research. Planning and design*. (9thed.). Pearson Education: Upper Saddle River, New Jersey.
- Lotz-Sisitka, H. (2008). Environmental education and educational quality and relevance: Opening the debate. *Southern African Journal of Environmental Education*, 25, 5-12.
- Lotz-Sisitka, H. & Lupele, J. (2012, in press). *Learning today for tomorrow: Education for sustainable development learning processes in Sub-Saharan Africa*. Howick: SADC REEP.
- Lotz-Sisitka, H., & Raven, G. (2001). Active learning in OBE: Environmental learning in South African schools. Pretoria: Research report of the National Environmental Education Project. Department of Education.
- Loubser, C. P. (Ed.). (2005). *Environmental Education: Some South African perspectives*. Pretoria: Van Schaik Publishers.
- Lupele, J. & Lotz-Sisitka, H. B., (2012). *Learning today for tomorrow: Sustainable development learning processes in Sub-Saharan Africa*. Howick: SADC REEP.
- Maxwell, J. (1992). *Qualitative research design: An interactive approach*. London: Sage.
- Michaelowa, K. (2001). Primary education quality in Francophone Sub-Saharan Africa: Determinants of learning achievement and efficiency considerations. *World Development*, 29, 1699-1716.
- Mogensen, F., & Schnack, K. (2010, February). The action competence approach and the 'new' discourse of education for sustainable development, competence and quality criteria. *Environmental Education Research*, 16(1), 59-74.

- Namibia. Ministry of Basic Education and Culture. (2005a). *Curriculum for the Lower Primary Phase: Grades 1-4*. Okahandja, NIED.
- Namibia. Ministry of Basic Education and Culture. (2005b). *Environmental Learning in Namibia: Curriculum Guidelines for Educators*. Okahandja, NIED.
- Namibia. Ministry of Education. (2010). *The National Curriculum for Basic Education*. Okahandja, NIED.
- Namibia. Ministry of Education and Culture. (1993). *Towards Education for All: A development brief for educators, culture, and training*. Gamsberg: Macmillan.
- NEEN. (1995). Draft National Environmental Education Policy. NEEN, Windhoek.
- NEEN. (1999). An Environmental Education Policy for Namibia. National EE Policy. Windhoek.
- Nikel, J. & Lowe, J., (2010). Talking of fabric: A multi-dimensional model of quality in education. *Compare: A Journal of Comparative and International Education*, 40(5), 589-605.
- O'Donoghue, R. (1995). *Environments and methods*. Howick: Sharenet, SADC REEP.
- O'Donoghue, R. (2001). Environment and active learning in OBE.NEEP GET guidelines for facilitating and assessing active learning in OBE.Howick: Sharenet.
- O'Donoghue, R., & Russo, V. (2004). Emerging patterns of abstraction in environmental education: a review of materials, methods and professional development perspectives. *Environmental Education Research*, 10(3), 331-351.
- Prince, M. (2004). Does Active Learning Work?: A Review of the research. *Journal of Engineering Education*, 93(3), 223-231.
- Rickinson, M. (2006, July-September). Researching and understanding environmental learning: hopes for the next 10 years. *Environmental Education Research*, 12(3-4), 445-457.
- Rosenberg, E., O'Donoghue, R., & Olvitt, L. (2007). *Educational methods and processes for responding to environmental and sustainability concerns*. Howick: Share-Net.
- Rosenberg, E. (2008). Eco-Schools and the quality of education in South Africa: Realising the potential. *Southern African Journal of Environmental Education*, 25, 26-43.
- Schudel, I., Dambuza, T., Lotz-Sisitka, H., Magonare, T., O'Donoghue, R., & Solomon, A. (2000). *Active learning through OBE: An interdepartmental support for the piloting of environmental learning Grades 4 and 5*. Howick: National Environmental Education Programme/Share-Net.

- SEEN. 2004. Extending SEEN until 2005. A concept paper for discussion. NIED, Okahandja.
- Shumba, O., Kasemba, R., Mukundu, C., & Muzenda, C. (2008). Environmental sustainability and quality education: Perspectives from a community living in a context of poverty. *Southern African Journal of Environmental Education*, 25, 81-97.
- Supporting environmental education in Namibia: Environmental Education in Namibia.* (2001). Nied.
- Tudor, M., & Ferguson, L. (2007). *Field Investigations: Using Outdoor Environments to Foster Student Learning of Scientific processes*. North America: Pacific Education Institute.
- UNESCO. (2009). *Bonn Declaration*. Retrieved May 28, 2009, from http://www.esd-world-conference-2009.org/fileadmin/download/ESD2009_Bonn_Declaration080409.pdf
- United Nations Environment Programme. (2006). Education for sustainable development innovations – Programmes for universities in Africa. Share-net: Howick.
- Van Maanen, J. (1979). In Welman, Kruger, and Mitchell, Research methodology (3rd ed.). Oxford: University Press.
- Vinjevold, P., & Taylor, N. (1999). Research methods. In N. Taylor, and P. Vinjevold (Eds.). *Getting learning right: Report of the President's Education Initiative Research Project* (pp. 65-104). Braamfontein: Joint Education Trust.
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Walker, R. (1990). *Doing research: A handbook for teachers*. Great Britain: Methuan and Co. Ltd.
- Wals, A. E. J., & Van der Leij, T. (1997). Alternatives to National standards for Environmental Education: Process-Based Quality Assessment. *Canadian Journal of Environmental Education*, 2, 7-27.
- Wals, A. E. J. (2007). Learning in a changing world and changing in a learning world: Reflexivity fumbling towards sustainability. *Southern African Journal of Environmental Education*, 24, 35-43.
- Weisner, H. B., Kreider, H., Mayer, E., Hencke, R. and Vaughan, M. (2005) 'Working it out: The chronicle of a mixed-method analysis', in T. S. Weisner (ed.) *Discovering Successful Pathways in Children's Development: Mixed Methods in the Study of Childhood and Family Life*. Chicago: University of Chicago Press. Pp. 47-64.
- Welman, C., Kruger, F., & Mitchell, B. (2005). *Research methodology*. (3rd ed.). Oxford: University Press.
- Yin, R. K. (2009). *Case study research: Design and research*. (4th ed.). London: Sage.

APPENDICES

Appendix A: Example of a coded transcribed interview

Interview with teacher 1

Interviewer

The first question that I want to ask you is... Why do you think this subject is part of the curriculum?

Interviewee

Okay... Environmental Studies... so Environmental Studies I think... the reason why it is part of the curriculum... hum... all the subjects like... I think it's the main... is it the main... so because all the subjects are integrated from Environmental Studies. Like English... normally we take a topic from Environmental Studies and we integrate this topic in all the subjects. (CI)

For example if you are doing... hum... what topic now... like my body. When we take my body and then we take the topic my body from Environmental Studies and then we integrate the topic in all the subjects... like for example we integrate it in Mathematics, in English, in Afrikaans, in all the subjects. So that is the reason why it is part of the curriculum.

Interviewer

Can you maybe explain how you do the integration?

Interviewee

For example if the topic is my body... so now in English we will talk about my body and in Mathematics we will use the different body parts for counting. For example if you are talking about counting you will... okay... you will use your fingers or you will tell the learners lets count our fingers. You include the fingers the eyes... it's what we are going to count with the learners... the different body parts.

Interviewer

Good! How do you think can the learners benefit from this subject?

Interviewee

Okay... from Environmental Studies the learners can benefit a lot because... it's... the subject itself include the environment. They will learn about the different things that make up the environment. For example they will learn about their health... to keep themselves healthy and they will learn their body parts, they will learn about how to keep their environment clean and they will learn about how to take care of their environment. (LBS)

Interviewer

Is there a specific approach to teaching and learning that is prescribed by the curriculum that you follow?

Interviewee

Yeah! The approach that I normally follow from the curriculum... now the new approach that is mostly used is the learner-centred approach... where you include the learners in the lesson. It is not like the teacher-centred approach that we normally used in the old days. We now use the new method of learner-centred education... where most steps of the lesson the learners are involve in the lesson. They will take part; they will go and do research. They will give their own understanding of the topic and you will find out answers from them. So this is the approach that we normally use now. (ATL)

Interviewer

Can you share any useful tips from training that you have received on how to implement this subject effectively?

Interviewee

I cannot remember of any training that I have received, besides from the training that we have received at the college. (TIS)

Interviewer

Can you maybe explain how you got the training at the college?

Interviewee

The training that we have received is just... we were just taught to understand that Environmental Studies is the main body of every theme/topic... so at the College they made sure that we understand how to integrate Environmental Studies in the rest of the subjects. What we must do and how we must do it effectively. So that is basically how we got trained on this subject. (TIS)

Interviewer

How do you introduce a topic when you start your lesson?

Interviewee

Okay... introducing a topic when we start our lessons differs... sometimes it depends on yourself... sometimes you will introduce the topic by including the topic in a song... maybe you are going to teach about my body then you will start with a song that mentions the different parts of the body or you can start your introduction with a rhyme which also includes what you are going to teach about. So it depends... it differs... or sometimes you just... you just... do a role play in the beginning of the lesson and from the role play you introduce the topic for the day. (LI)

Interviewer

What teaching methods and strategies do you use when you teach the content of the lesson to the learners?

Interviewee

Hum... Okay... what I will do normally... I will mostly let the learners be more involved in the lesson. For example after the introduction I will put a poster on the board... first I will explain to them what I am going to do and then I will put a poster on the board and then the learners will put up the different things I... let me take a topic... for example the body. So I will explain to them first about the body.... the different body parts. Then I will put up a poster and then from the things that I have explained I will ask them to come and put up flashcards so that I can see if they understood what I have explained to them. First after the introduction I will do an in depth explanation of the body and the different body parts and after that I will let them be involve in the lesson. Either by putting up flashcards or either by flashing the flashcards and they should go and put up the flashcards on the board. (MS)

Interviewer

Do you ever ask them questions to involve them in the lesson?

Interviewee

Yeah! So that part it's like first you introduce then you explains and then you... but normally the explanation are just you explain and then you also find out from them. It is not like you are the only one talking. You explain and then you find out from them also and then after that you test their understanding. You will put something on the board and they will have to come and do it practically themselves. (MS)

Interviewer

Do the teaching methods and strategies allow learners to be actively involved in the teaching and learning process?

Interviewee

Yeah! (MSLAI)

Interviewer

Can you explain in what way?

Interviewee

It's just like the way that I have explain it because at the end I will let them come and paste the flashcards and come in front and... What else... yeah mostly by putting up flashcards. (MSLAI)

Interviewer

Do they ever have to write on the chalkboard?

Interviewee

Yeah, sometimes they write on the chalkboard and later they will do the written work in their books. (MSLAI)

Interviewer

How do you conclude your lesson to ensure that the learners understood what you have taught them according to what is stipulated in the curriculum?

Interviewee

Okay... after finishing the topic or the lesson for the day I will normally give them a worksheet to do at their tables or in groups or something. It depends what I have planned for the day. Maybe it is individual work or sometimes they work in groups but I will end my lesson presentation with a worksheet. They have to write something to test their understanding. (LC)

Interviewer

Do you think that the learners will be able to apply the knowledge that they have learnt in their everyday lives and why do you say this?

Interviewee

Yeah... they normally do... they normally do apply what you have taught them in their everyday lives because mostly for the young ones they... what you teach them are what they will remember for life. So mostly they will really try to practice what you have taught them in their daily lives. Mostly but there are also the ignorant ones but most of them do practice what you teach them. (LAKE)

Interviewer

Can you give an example of such a practice of knowledge?

Interviewee

Okay! Hum... example... for example if you teach them about water... you will teach them not to waste water. They have to close the tap and you will see that if you teach the lesson... it depends... if you teach the lesson about water... about saving water... you will even notice... you yourself will even notice that now all the taps are close they don't leave taps dripping. If you go into the toilet you will see that the taps are not dripping anymore. I see... you will see that half of them will know but you will also find the ignorant once but most of them will know that the tap is dripping they need to go and close it for the others who are ignorant. (LAKE)

Interviewer

Do you think that the knowledge learnt in the lesson will help the learners understand sustainability?

Interviewee

Yeah, they will understand. (KLUS)

Interviewer

Can you give an example of such an understanding of sustainability?

Interviewee

Like sustainability is like... they will understand to keep something (KLUS)... it's like...

Interviewer

Can you maybe give an example of such a topic or lesson that you know when you present it to the learners it will help them to understand sustainability?

Interviewee

Most of the topics really teach them to sustain themselves... for example... water and keeping themselves clean and all those things. (KLUS)

Interviewer

So you think it will help them understand sustainability?

Interviewee

Yeah, it will! (KLUS)

Interviewer

How do the learners react towards the lesson as a whole?

Interviewee

They enjoy the lesson... they enjoy the lesson. They give their... they give like... how can I say it... they enjoy the lesson and are positively involve in the lesson. If you give them something to go and do at home, they really go and do what you have taught them or what you have told them to do or if you tell go and find out something they will bring back the feedback that you have ask. (LRTL) So they are positively involved in every way.

Interviewer

So they enjoy the subject?

Interviewee

Yeah they enjoy the subject very much.

Interviewer

Do you enjoy teaching the subject?

Interviewee

Yeah I enjoy teaching the subject... it's just now the problem with the time. (DEP)

Interviewer

What difficulties do you encounter when you teach the subject?

Interviewee

I don't encounter any difficulties. (DEP)

Interviewer

Why do you think you experience these difficulties? So you don't experience any difficulties as stated before so this question is actually irrelevant. (DE)

Interviewer

What do you think can be done to overcome these difficulties that you experience during the lesson implementation process?

Interviewee

As I said before I don't experience any difficulties in this subject. It is a subject that the learners really enjoy very much. It is a subject like... you know the things... it's like the things that you do every day. It's part of your daily life... so for you to present it is also very easy, it is not so difficult and for the learners they enjoy the subject because it is almost... they almost have knowledge about the most topics because it is also part of their everyday lives. (DE)

Interviewer

So would you say if they know almost everything or they know the topics that you teach them are there than new things that they learn?

Interviewee

Yeah, there are new things that they learn because... it's like... for example if you take a... a topic like my body. If a child know that these are fingers but you don't get stuck on fingers you go deeper into the different things of the body. You go deep inside where they can also not see. So you will teach them things that... some of them will know but then there are also those who don't know at the end.

Interviewer

Can you maybe give an example of something that they don't know about their bodies?

Interviewee

Hum... things that they don't know... for example in grade 2 we normally teach about the outside parts of the body we don't go into the skeleton and the bones inside but then there come things like the pupil that they didn't even know that there is a pupil in your eyes and what is the function of a pupil. Yeah... and then the different functions... you add more you don't stick to only one thing. You don't teach like only the body parts you add more.... like for instance the senses.

Interviewer

Thank you Teacher 1! We have come to the end of this interview and I really appreciate your willingness and cooperation for being a participant in this research study. I really enjoyed having this conversation with you.

Appendix B: Coded transcript of Focus Group Discussion 1

Transcript of Focus Group Discussion 1

Interviewer – Active Participant

I am giving you back the transcripts of the interview and I want you to read through it first and check if I have typed out what you have said in the interview and if it is correctly done and if you agree with the information. Then afterwards I have typed out all the answers together under one question and then we can have a discussion about it and I also want to give my input because I couldn't interview myself but I also want to say how I feel about the questions. So you can just read through it and if you agree... just say okay fine... and then you can sign on it with a pencil.

Interviewer – Active Participant

I forgot to say... if you want to add something you can just write it down with the pencil and if you also don't agree just indicate on the paper where you don't agree... don't agree with this.

Interviewee – Teacher 2

This is the way I answered... if I try to add now... it's like I am trying to copy from what I have read from the other answers. So I will just leave it like that.

Interviewer – Active Participant

Okay, can we continue? Are you done? Okay let's look at the... analysed transcribed interviews. So what I have done here. I took the questions and I took out the information that I think was relevant to the questions according to what you have answered. So I want you also to say if you agree with this. I know you will be able to identify where you have answered. Where your answer are...

Interviewer – Active Participant

Interviewer read the questions and analysed answers. So why do you think this subject is part of the curriculum? So the first one is... An environmental study is the main carrier subject and all subjects should be integrated from Environmental Studies. The topic should be taken from Environmental Studies and should be integrated into the rest of the subjects. Yes, I agree with that it is stated in the curriculum that. Environmental Studies is part of the curriculum because we have it in class as a subject and it is present on our timetable throughout the year and the learners are assessed on this subject as well. This is also true. Environmental studies give them

a broader picture of a healthy lifestyle and to obtain more knowledge about what is going on around them. Which is also true and for me... what Environmental Studies does for me is... it gives them a picture of what is going on around them in their environment and how they can help themselves with these natural resources that they have and what they should do with it and how they should work with it. That is what it gives to me. (CI) But what is lacking from my point of view is they say Environmental studies should be based on education for sustainable development. That is now the umbrella that is above education or environmental education but when they talk about education for sustainable development. They say that learners should be taught in a way that they should act for the environment meaning that they should do something for the environment. Not only learning facts... and then go out and look for it in the environment... so this is what the facts are saying... so it is there... I understand it... I have been made aware... but we are not doing something for the environment. We are not taking action about the issues/risks/concerns that we see that are taking place around us.

So hum... the next point. How do you think can the learners benefit from this subject? Learners can benefit a lot from Environmental Studies because the subject includes the environment and therefore will learn about the different themes that make up the environment, for example how to keep them, how to keep the environment clean and how to take care of the environment. Yes! From my observation the learners benefit a lot from this subject because it is more about the environment, where they live, what they go through and what they see every day. Even though they see and live with all these things around them they are not learning much about it at home but in class we teach them, explore with them and explain in more detail why they see these things around them at home. I also agree with that. It can broaden their knowledge because their general knowledge is sometimes limited. Then there are also those learners who will go and find out more than what they do in class. That is also true. If you are interested in something, you will always go beyond what you have been told because you are so interested you want to go see for yourself if it is true. Okay, from my point of view... I will only say that they can benefit. How can they benefit? Through getting information and being made aware. (LBS) As I have said before what is lacking from my point of view is action.... to take action.... okay...

Is there a specific approach to teaching and learning that is prescribed by the curriculum that you should follow? The approach that I normally use from the curriculum is the new approach that is the learner-centred approach.... whereby you should include the learners in the lesson. It is not like the teacher-centred approach that we normally used in the old days. We now use method of learner-centred education whereby in most steps of the lesson the learners are

involved the learners will take part by doing research. They will give their own understanding of the topic and you will find out answers from them. Yes! There is a prescribed method that one has to follow in the curriculum. We mostly have to do research on the topics that are in the curriculum. The learners have to go and find out about the topic and we as teachers have to explain to them what the topic is about so that they will be able to relate the information of the topic to how they live at home. Yes, that is what learner-centred education wants us to do. Even though she didn't spell out what the approach is... it is about that... going out, doing something, being involved. There is no prescribed approach that we need to follow as long as we can transfer the knowledge to the learners. It is also true because in the curriculum it is stated... that we are advise to use a learner-centred approach but there different ways on dealing with the learner-centred approach. Sometimes you will have to transfer knowledge. Sometimes you will do group work and let them discover the knowledge or in pairs or will send them out to seek for information... come back with the information and sometimes you will just lecture them because there are facts that they really don't know about. You just need to do the lecture method. Where you are now the expert and they are now the receivers of the knowledge... (ATL) so... I also agree with that.

Can you share any useful tips from training that you have received on how to implement this subject effectively? I cannot remember of any training that I have received besides from the training that we have received at the College. At the College we were trained to understand that Environmental Studies is the main carrier subject and therefore we were taught how to integrate Environmental Studies into the rest of the subjects. Okay! I didn't receive much... I have taught myself that to be successful in this subject, I have to do research as I have mentioned before. For example if I give the learners a topic I also go and do research myself. I do research through my surroundings whereby I ask questions. I interview people about the different things that I see although I don't know much about it and by doing that I learn more from them. I didn't really receive any training on this subject because I am not qualified in the Lower Primary Phase grades 1-4 but instead I did my qualification in the Upper Primary Phase grades 5-7. So my conclusion here is that even though we got training on this subject. We were not actually trained on how to implement this subject effectively and from my point of view I didn't get the content knowledge that I need to teach this subject and also a method that you can use on how to implement this subject. (TIS) I don't know... sometimes you just sitting here lecturing to them, telling them the story, asking them questions and then you give them a worksheet. They answer the questions to test whether they have captured the knowledge and then later on you

will let them write a test, you will record the marks and the marks will look good but what in the end did you actually.... what in the end did you actually do for the environment... or you and the learners together. Again it is just about facts and transferring the information and being made aware.

How do you introduce a topic when you introduce a topic? My introduction of the topic varies according to the different topics. Sometimes I start my lesson with a rhyme sometimes a song or sometimes I will introduce the topic by doing a role play. Most of the time I start my lesson by asking questions specifically about the topic, to get an idea about the learners understanding of the topic, to get an idea whether I should start with the known of the topic or the unknown of the topic. I first ask questions about the topic, which they have to go find out at home. The questions will be to go and find out what the topic is about to see what their understanding is about the topic. Yeah, this is also how I introduce my topic most of the time. **It's just to ask questions, see what the level of their knowledge are about the topic... hum... and then I will also just start lecturing them the content (LI)** and so on.

What teaching methods and strategies do you use when you teach the content of the lesson to the learners? I will mostly let the learners be more involved in the lesson. After the introduction I will explain the topic to the learners and then let them put up flashcards to test their understanding of the topic. During the explanation process I usually ask them questions as well as to make part of the lesson. I mostly use pictures or concrete materials when teaching the content of the lesson to the learners. For example when teaching the lesson of the flag as a topic I use a picture of the flag or the flag itself to demonstrate how it should be put up and from there I explain what each colour represents. I usually let them discuss the topic in group or in pairs but I mostly use group work. After the discussion in their groups or pairs they have to get feedback on what they had to discuss and from their feedback I construct my own notes to give to them. This is done to ensure that they get all the content knowledge. So I first find out what they know from their discussions and then I add from what they don't know according to the topic. Yeah, this is also basically what I do... hum... **I can't actually let them work in groups. Just here and there some topics... but for grade one it just like you should take the lead all the time. The only way how I can ask them to work in groups is when they have to draw something. (MS)** They put their minds together about the many things they need to draw. For example... say I want them now to draw... or ... to distinguish between healthy and unhealthy foods. Then maybe I can let them come together in groups and so okay... this side draw the

healthy foods and on the other side draw the unhealthy foods. This is the only way that I can really get them involve.

Interviewee – Teacher 2

Because this subject is so interesting... if you give them to do in group work also... they will just mess up... everyone will want to take over.

Interviewee – Teacher 1

But mostly... like... hum... I think group work must mostly come... if you want to do group work it must like be the end... where they have the knowledge... where they only now need to apply... you have done everything... the content and everything is now applied... we just now let them enjoy themselves at the end.

Interviewee – Teacher 3

But it can also be used in the beginning because then you can see what knowledge they have about the topic so you can conclude in proper way... if they don't have the necessary information.

Interviewer – Active Participant

Do the teaching methods and strategies allow learners to be actively involved in the teaching and learning process? Yes, it does because at the end of the lesson I will let them come and put flashcards on the board and sometimes they also have to write on the chalkboard and do written work in their writing books as well. Yes, it does a lot because they participate more with the knowledge that they have although they don't know more in detail about the content of Environmental Studies they have the knowledge. It is just that they don't have the details of the content. Yes, because they have to discuss and sometimes I let them decide who can be the group leader and sometimes I also decide who should be the group leader so that everyone can be active. Sometimes not all are actively involved in the group work process but if I let them work in pairs then only they will give their input as well. **Now what I have learnt about the active involvement, especially with the learner-centred approach... we want the learners to be busy... and let them do things but are they really learning something from what they are doing?** **(MSLAI)** You are asking them... for instance... how do I say it now... to construct a house for instance... for... like... your topic was about a house... now in the end you ask them in the end construct me a house... with box or draw me a house... but what actually... through that

application what did they learn... they were involve but were they learning something meaningful... by constructing that house.. Or you ask them draw me a picture of healthy and unhealthy foods. Now they draw the pictures but what did they learn about healthy and unhealthy foods... okay... these are the healthy foods and these are the unhealthy foods.... but what did they learn about it.

Interviewee – Teacher 1

Okay, what about... like for example if you are teaching healthy and unhealthy foods... and first you do the introduction... like there is the presentation part where you will have to present and then you explain to them why it is important to eat healthy food and why it is not good to eat unhealthy food. So there they have learnt... isn't it... and at the end where they have to draw the pictures... with the drawing they will know... what teacher said is like... hum... food unhealthy because it does this and this and this... and these once its healthy because it does this and this to my body. I think they will understand.

Interviewer – Active Participant

Yeah, they will understand but what I am actually coming to is that... they do it in the classroom they are involved... they understand what you have presented... they do this and they do that... the healthy and the unhealthy but will they be able to go and apply it at home. Will they go out and say mother... I'm not supposed to eat this food because of this and this and this. I am only supposed to eat this food. So it's like the knowledge is staying there in the classroom it is not getting out like it should... and this is the main concern about environmental education. That the knowledge is staying in class, it is not going out.

Interviewee – Teacher 2

It is not being applied in real life.

Interviewee – Teacher 1

Yeah, but what I have noticed you will find those ignorant once... that really... for them.... they don't make that... what you teach... they don't take and make their own like the principal said... they just learn it and for learning and they don't care anymore... but then you find that one child that really make it their own... for example the child will say to the mother... no mother I am not suppose to eat fat because fat is fat... but then the mother will say no just eat it there is nothing else at home to eat... so just eat it... but she will know it and she will remember... when she is

growing teacher said fat is not good and she will remember... but my majority they just keep it here (in school)... and this is only for the teacher.

Interviewer – Active Participant

This is now the problem with parent involvement. How can we get the parents involved in this subject?

Interviewee – Teacher 2

How can we get them involved? Maybe we should teach the community as well. So it means Environmental Studies must be taught at the community level as well. We have to hold meetings like how the social workers... hum no... The ministry of health is doing... when they are making awareness of different diseases.

Interviewee – Teacher 1

It is true... and what I have noticed is that parents don't... you know... just say what your teacher... teacher say, teacher say everyday... no do this... they don't take it seriously when the child say teacher said this and that. This is my house I will decide.

Interviewee – Teacher 2

We should do it the way the ministry of health is doing their campaigns. You know booklets... hum... copy booklets... send it out to the community... maybe make them aware at the school you can collect this and that.

Interviewer – Active Participant

Maybe workshops...

Interviewee – Teacher 2

Maybe workshops like hum...

Interviewer – Active Participant

Like in parent meetings... or maybe you can teach a topic and you can involve them by giving questions... like... saying it's now a project for your child that the child will get marks for so they will have to give their participation. Okay! How do you conclude your lesson to ensure that the learners understood what you have taught them according to what is stipulated in the curriculum? After finishing the topic or the lesson of the day I will normally give them a worksheet to do at their tables or they will have to work in groups. Most of the time I will

always ask them questions at the end of the lesson. After that I will give them a task to complete at home and bring back the answers to me. I prefer to ask them questions in class than giving them a task to do at home because in class I know that the answers are their own. Rather than the task that is given to do at home because the answers might be coming from their parents. So for me to send a task home is to get knowledge from them and to ask questions in class is to test their understanding of the content taught to them. I just ask them a few questions, specifically those once who don't pay attention in class to make sure whether they understand the subject content. Thereafter I will give them a worksheet or a written activity to complete. This is more or less what I do. Just give them a worksheet or just give them questions. I can hardly actually give them questions that they can complete on their own. I must work through it with them so that they can understand what they are supposed to do by guiding them through the questions. (LC)

Do you think that the learners will be able to apply the knowledge that they have learnt in their everyday lives and why do you say this? Yes, they normally do apply the knowledge what you have taught them in their everyday lives because mostly for the young once they will remember what you have taught them for live. So mostly they will really try to practice what you have taught them in their daily lives but there are also the ignorant once that don't practice what you have taught them. For example, if you teach them about water you will teach them not to waste water. After I have taught the topic I notice that there is no more dripping water or running taps. If you go into the toilet you will notice that no taps are dripping anymore. You will also find the ignorant once but most of them will know that the tap is dripping they need to go and close it for the others that are ignorant. I believe they will be able to apply it because I have seen applications taking place especially on hygienic matter. When we teach them about how to keep them clean we see the results personally that they have now moved from how they have behaved before the topic and after the topic. Yes, I have seen that because in the first topic which was about the five senses. They really applied it in their English theme. They really integrated the subject content learnt in Environmental Studies into their English lessons. When I did the topic about HIV and AIDS I asked them to role play how they will treat a person who is infected with HIV/AIDS and some of them avoided the person who played the role of the infected person and then there were also those who really tried to care for the person. So I think that they will be able to apply the knowledge what they have learnt in their everyday lives.

Yeah, I also think so because sometimes they do sometimes they don't. It depends on how familiar they are with what you are teaching them. If it is something that they are not familiar

with and they are not practicing it. (LAKE) like maybe sometimes at home. Then the things about washing your hands before you eat. Now you teach them here at school... if they see someone do it at home they will also follow in their footsteps because they have also learnt about it at school. They will know I must do it but at home they were never taught to do it. They just see this person always go and wash his/her hands... but I don't care... maybe they just wash their hands to smell nice. I will just go and eat my food without washing my hands. What I want to say is Environmental Studies teach them to apply the knowledge in their everyday lives even though some of the knowledge gets lost along the way. They sometimes do apply what we teach them but it is now for them but what about now for the environment. What are we doing for the environment? We are getting all these natural resources from the environment to make our lives a fulfilled because without it we can't survive. We can't survive. This is now where education for sustainable development comes in and it should be done across the curriculum. Looking at different issues... When you see a topic... you see... but this is an issue... it is an environmental issue in my community. So I must address it... and I must use my learners... so I must also make them aware so that they can take action for a better community to live in.

How do the learners react to the lesson as a whole? They enjoy the lesson and are positively involve in the lesson. If you give them something to go and do at home they really go and do what you have taught them or what you have told them to do or if you tell them to and find out something they will bring back the feedback what you have asked them. The learners enjoy the lesson very much because it is something in relation to what they live with. They are very much involved and they participate a lot. Sometimes they seem to be really interested for example when I taught them about the topic living and non-living organisms to them. At first they were not interested but then the next day when some of the learners came back with the answers which they had to go and find out. The others also became interested because it was about characteristics of living organisms and they really enjoyed it.

Interviewee – Teacher 1

I was in trouble with Tuundjakuje with that one... and are was wondering what is non-living... it was out of my mind... non-living and living... I asked what did the teacher say... and she replied non-living... then I realised oh.... it is things that are not alive.

Interviewee - Teacher 3

I had to explain that to them the whole period for to grasp the understanding.

Interviewer – Active Participant

What difficulties do you encounter when you present the lesson? I don't really encounter any difficulties apart from the limited time that we have. I encounter discipline problems because all the learners want to participate at the same time because they feel they will be left out or they will go with the answer or the contribution that they wanted to say because the time is limited and everybody just want to say something and sometimes it a bit of discipline not in place. This actually happens because of the limited time that we have for this subject. Sometimes I really don't know what teaching aids (learning support materials) to use to make the content more clearly to the learners. Now why I have put there learning support materials in brackets is the way that we address now the things that we use in environmental education. Yeah, **for me it is also the time... and also lacks of subject content... for me also... a lack of methods because I am working with small learners... I tend to just move into the method of rote learning all the time because it is small learners and you can't work with them like in smaller groups especially in the beginning of the year when you must still guide them with every single thing. (DEP)**

Interviewee – Teacher 3

But I have noticed the internet has very nice information and pictures, especially the pictures... but now it looks like it... they are on a lower level to use for the grade four's.

Interviewee – Teacher 1

So for us there is something...

Interviewee – Teacher 3

Very nice

Interviewer – Active Participant

What do you think can be done to overcome these difficulties? As I said before, I don't actually experience any difficulties so I don't have any answer to this question. Mostly with the discipline problem that I have mentioned, I feel that it will be difficult because the subjects are already stipulated on the timetable and with the time I feel that Environmental Studies should have more open time in the afternoon, whereby the teachers and the learners go and out and do research have time to talk about the things altogether with enough given time before coming to the class.

Interviewee – Teacher 1

Yes, that would be nice.

Interviewer – Active Participant

And then you can also see what it is wrong and you can make them aware and you can back and discuss and see what you can do to make it better, to solve it, to get solutions.

Interviewee – Teacher 1

Because with this Environmental Studies you don't even have time... it's like they are coming from the other class late and then you just have to run through the topic. You don't even have time to go out and do research. Just for them to go and look at the insects or something. We don't do that, we don't have that time.

Interviewer – Active Participant

Yes, the time is not there and also... what also happens with me is that I steal... I steal the time of Environmental Studies for my languages and then there is only twenty minutes left and for me it's just to do a quick, quick something. (DE)

Interviewee – Teacher 2

Yeah, for me Environmental Studies... like for me... like last... I think the whole of January towards the end of February I didn't teach any Environmental Studies. I just teach Math and English and no Environmental Studies and Religious and Moral Education. I don't teach this subject that much really.

Interviewer – Active Participant

What I do... is that I integrate the Arts with Religious Education and Environmental Studies and then I will just give them a mark... or sometimes I use the songs and the rhymes also as an Arts mark and also as an oral mark. Wherever I can I will just try to integrate.

Interviewee – Teacher 1

Because for me sometimes I will just introduce the topic and teach a little bit and the next day maybe when they come from the Afrikaans class they will do written work and you know coming from the Afrikaans class some of them are in the toilet.

Interviewer – Active Participant

Otherwise you must go and fetch them yourself to avoid that.

Interviewee – Teacher 2

Yeah, it's true.

Interviewer – Active Participant

Okay! I should just plan in advance to avoid getting stuck and if I could get training on this subject it would definitely also be helpful. What I wanted to say now is do you agree on how I analysed the information coming from the rough data or is there something that you want to change.

Interviewees – Teacher 1, 2 and 3

No, it is nicely and properly said than the rough data.

Interviewee – Teacher 2

I am very sorry but I didn't know we are going to stay this long. I need to go and fetch my daughter she is waiting for me.

Interviewer – Active Participant

Can we stay another day if it is okay with all of you? So all of us will then come tomorrow and do the reading of the rest of the information tonight and discuss it tomorrow.

All agreed! The end....

Appendix C: Coded transcript of Focus Group Discussion 2

Focus group discussion 2

Interviewer – Active Participant

Good morning colleagues!

Interviewees

Good morning...

Interviewer – Active Participant

Hum this morning's focus group discussion will be hum about reflecting back on the lesson that we have planned and presented. Using the active learning framework.... now the first question that I want to ask you is what is your personal feeling of presenting lessons according to the active learning framework and why? And you should be really honest... this is now trying out... not wanting to promote the active learning... but if it is working for you then say so if it is not than say so... or if there's areas that you are not feeling comfortable with it than say so... just be honest.... laugh... Teacher 3

Interviewee – Teacher 1

Okay, let me see... okay for me... let me start with the whole lesson before I go to active learning... I don't know really...

Interviewer – Active Participant

You don't have to go through the whole steps... just in one sentence say how you are feel about it.

Interviewee – Teacher 1

Like in one sentence

Interviewer – Active Participant

Hmm

Interviewee – Teacher 1

Okay, for me the lesson... I think the lesson went well some how... looking at the learners... how they came back with the feedback... and they try to report what... they have tried what they have found at home... about the way how to save water... now with very good explanations of... of very good ways or reasons... but... first the presentation... hum... I don't know... (VALP)

Interviewer – Active Participant

Hmm

Interviewee – Teacher 1

I say... okay the learners... the learners learnt... they find out... the way went to find out the information was very good... it was very good... but for me the lesson presentation itself it... I don't know... it was not working for me. I didn't feel the lesson... (VALP)

Interviewer – Active Participant

Why not?

Interviewee – Teacher 1

I don't know...

Interviewer – Active Participant

You don't know

Interviewee – Teacher 1

Hmm, I just didn't feel it... it was just like something that I was presenting not something... there is sometimes you know that you find lessons that you really feel... you present from out of heart... you really feel like it is flowing in your system... that one was not flowing. (VALP)

Interviewer – Active Participant

Oh!

Interviewee – Teacher 1

Yeah, I don't know...

Interviewer – Active Participant

You say... was it the topic or was it the way that you planned the lesson...

Interviewee – Teacher 1

Maybe the way that I have planned the lesson... I don't know... but at the end I think the learners learnt something from it... they understood and they really come up with suggestions on how to save water. (VALP)

Interviewer – Active Participant

Okay

Interviewee – Teacher 3

I would say... Hum, it is not always a nice thing because sometimes learners don't take whatever is being discussed seriously or the way that they should consider it... because sometimes you will find people joking or learners around about serious things... so that can also be a problem when you ask them to come up with their own or being active lesson.

Interviewer – Active Participant

To give their... own ideas...

Interviewee – Teacher 3

Yeah, to give their... own ideas...

Interviewee – Teacher 2

I would say... from my side... from the teacher's point of view... hum... it was a good... a good lesson of involving active learning in... Learners could really go seek for information... and they could come and report back... I could see that they are really learning to take action... because we... they were active in this learning... they took it as something of their own... they were actively involved... to know more about the lesson... it was like... they were personally assigned... to get this information as... hum... what word should I use... as a daily life experience... as a necessity life... something... because of putting them to be active... the way they understood it... was like it is... it is not an assignment... it is just not a school work... but it is an issue in life that I need to look at and hum... what do I see and what can I do about it? That was my point of view... though... hum... there was too much active in it that it created a bit of chaos because everyone experience what they went to seek for and they really wanted to give that feedback... the report back... like I said earlier in the first interview... that time consuming in this environmental learning is a bit limited. (VALP)

Interviewee – Teacher 1

Yeah, the time was also very limited and just to come to one thing... one thing that I also... the good thing that I have also experienced with my learners... just for the grade 2's to come with the... with hum... with the solution... and say that we have to put notice... I didn't expect that from them... I thought maybe they will go around the bush and give other answers... but they really come to a point that they have realised that we have to put notice at every tap (VALP) or something like that. I was... I was so...

Interviewer – Active Participant

So would you say that the lesson allow them to think critically?

Interviewees – Teacher 1 & 2

Yeah, critically

Interviewee – Teacher 2

It's... it's a reality for them... yeah it's a reality... not just something that they are studying and forget about it (VALP).... hum...

Interviewer – Active Participant

Not just theory that is given to them but they experienced it in real life and from this they might remember it for future use... they are applying what they have learnt in their own lives. From my point of view... yeah... the learners really enjoyed it... they were very much excited... everybody wanted to give back or reported what they went to seek... that also caused discipline problems... laugh... and very much frustration and they couldn't understand but why can't I also give mine...(VALP)

Interviewees

Yes

Interviewer – Active Participant

Because in my lesson I asked them to report back individually... and because of the time everybody couldn't hum... get a chance and I actually had to add one more period to my topic's presentation and what I did then I kind of hum... developed a table...like a... table yes... where I now put down the words because I had... they had to... to go and find out with the parents help... what are they having for breakfast every day, lunch, sapper, snack times, what are they eating... (VALP) okay... okay we will wait for you... (Unexpected interruption: one of the colleagues were called to the office) okay and that seemed that they... that they... that everybody was now satisfied... I don't know from Teacher 3's view that was now observing the lessons... if they were satisfied... the way that I have handled that reporting back activity...

Interviewee – Teacher 3

Yeah, I think they were satisfied, accept for the few that were now unhappy that they could not present their stuff individually...

Interviewer – Active Participant

Yeah, and what I did was that I actually told them that we're going to present... those that didn't present... I will give them a chance to present theirs orally in English... and then I use it as an oral topic... yeah mark... and the other thing that was... apart from the time and the... like everybody was now like just eager to cooperate (VALP)... hum... was the fact that hum... I actually wanted to give another lesson... to take them out to do the planting of the carrot seeds... that we've discussed now... that is the action that we're going to take... to plant carrots to do something for the environment... which they can later also use... because one of the issues was that hum... in grade one the nurses detected that there are many learners with poor eye sight... so now for.... eating carrots will help them to... to help with their eye sight... but also for me... okay... I think it can work... if you can just go... get use to the idea... get through more and more topics through this hum... feeling it will probably happen through practice... so hum... yeah that is now from my side my personal feeling... I think it can work... just hum... getting more acquainted with it... practicing it more... and the learners are really enjoying it... so I think from my point of view it can work. (VALP)

Now what difficulties did you encounter when you planned your lessons? When you planned your lessons according to this framework and why? It is now only the planning not the presentations.

Interviewee – Teacher 3

I think the difficulty... hum... was with what teaching aids (learning support materials) to use... I am not very eager to use teaching aids... I like to use my learners... but then... even when I planned... let's say for example in the first lesson I wanted to use... hum a poster... but then... when the time came to present the lesson I just decided I will not use a poster... I just gave my learners hand outs... so I think the teaching AIDS is a problem.

Interviewee – Teacher 1

Okay for me it was just... I didn't... it was difficult for me to... I wanted to put a poster... hum... about the... about on how to safe water... I got pictures so that we can discuss... now first I wanted them... I didn't know what to do now... must I just let them go and find out... hum on how to save water for themselves or must I discuss with them and then let them go and find out... so for me it was a little bit... I didn't know how to put my things in order... whether I must put the poster the poster and discuss or leave the poster and let them go and do the research for themselves. That is now why I just decided I will just put a few things and then maybe I will just ask them to go and get more but different from mine (DELP)... yeah... so

Interviewer – Active Participant

Yeah, what I have observed... I could see that you were not feeling comfortable of the way that you have sequenced the thing it was as if... you were not sure if there's a flow... because when you present your lessons you want it flow and I could observe from her that she was not feeling very comfortable... and I think yeah, it was the sequencing of the activities that you prepared for the lesson but in the end I think it went well... I think it went well...

Interviewee – Teacher 1

Yeah, just...

Interviewer – Active Participant

I think if you were just feeling surer of yourself it would have been like in a very good lesson because learners can also sense when the teacher is not there.

Interviewee – Teacher 1

Yeah

Interviewee – Teacher 3

But the problem is also sometimes you plan a lesson...

Interviewer – Active Participant

But this is now the first round of... your first experience with the active learning framework so there will be uncertainties and there will be uncomfortable feelings... am I... because you want to do the right thing... because you know you are being observed...

Interviewee – Teacher 1

Now you are being observed and you have to work according to the steps... it's not like now the way you teach your class normally... huh... now you have to go according to the steps and now you are unsure did I put the step or is the step in my lesson or not... now it's like... even, even... by the way I was now writing the lesson I didn't know... did I put everything which is wanted in the lesson or not (DELP)... that is why...

Interviewer – Active Participant

Yeah, I could sense that you were feeling very unsure... but this framework you can start anywhere but your main... starting point will be your focus... the issue/ the risk/ the concern... but what we did was... we first... gave the learners the background knowledge and see what they know about the issue... Like I first gave them background on food and then from there I now worked towards identifying the issue... yeah and I also sense that with all of you... so we first started with the knowledge and then we went in to see what is issue in that or the risk or the concern... and from there we asked them to go and do enquiries and then they came to report back and then they took the action. They came up with solutions... so and it doesn't have to be like this... you can actually also start off with the action... and from there you can now see what do we still have to find out about the action that we have taken and then you do report back... or you can... then afterwards see what are we still... what do we still need... to make this action work... so you can actually start anywhere with these three... okay reporting back will always be when you are done with all of them... so... yeah...

The difficulties that I have encountered when I planned my lesson... oh... I head many difficulties. Hum, on what activities to use to... mediate the lesson... to help the learners to get to the point where I will now raise the issue to them... but in the end I think I managed. (DELP) I am not sure... let me ask the observer. Laugh! Because she observed me.... yeah

Interviewee – Teacher 3

Manage to do what

Interviewer – Active Participant

To hum... lead them to the issue... through the activities that I used.

Interviewee – Teacher 3

Yeah

Interviewer – Active Participant

The activities or the worksheets are usually called the mediation tools.

Interviewee – Teacher 1

What was the topic?

Interviewer – Active Participant

Nutrition

Interviewee – Teacher 1

Nutrition... oh...

Interviewer – Active Participant

Healthy and unhealthy foods and then the issue was now... unhealthy foods... hum... gives you rotten teeth... like sweets... which was also detected from the nurses who examined them and then also weak eyesight... so... hmm

Interviewee – Teacher 3

Yeah

Interviewer – Active Participant

Okay! Have you covered all the areas of the active learning framework during your lesson presentations or not and why?

Interviewee – Teacher 1

Okay, mine I think I covered so far because hum... hum... they went to seek for information... they went to seek the information for themselves and they reported back their ideas of what they have found out and then they even... and then they even... although we didn't take the action physically they came up with an action that we were suppose to take... which is now putting up notices... and reminding the people to save water or reminding the people to close the taps or something like that... although we didn't do it physically yet so they came up with an action and enquiries they also went to find out... to enquire about... on how to save water (IALP)... I think the action... I think all four of them they are in....

Interviewer – Active Participant

Were in the lesson

Interviewee – Teacher 1

Hmmm, they were all four present (IALP)

Interviewee – Teacher 3

Okay, hum...

Interviewee – Teacher 1

You know they just... they just... they just came in without me even noticing.... you know I didn't focus on the five lessons... on the five steps... I don't know... those five steps that just came by it self... when I planned my lessons (IALP)

Interviewer – Active Participant

I could see you were really feeling very uncomfortable... am I doing the right thing or not...

Interviewee – Teacher 1

I didn't focus.... when you said... you know when you said... when I came here and you said the five steps... I don't think if you.... you take... if take all the five steps... then I thought it is true hey... and then I went to look at the five steps again... I was supposed to follow steps... hum... but any way they were there... laugh!

Interviewee – Teacher 3

Okay, I think I have covered enquiry, information and reporting but since there was not any... hum... how can I say... interaction with the actual environment I am not sure... about action taking... because they went to seek for information... they've asked questions which can be... enquiry and then they also reported back...

Interviewer – Active Participant

And they took action because in their lesson I remember that they have role played the ways of hum... not being racists... racist towards one another... so they came up with that solution how to... to act towards one another without being racist... I also explained the lesson to my supervisor and she said actually they took action because they were role playing... hum... showing how we should live amongst one another without being racist... they only thing is they didn't take action for the environment... so active learning was taking place but... there wasn't actually action taken for the environment... which is what environmental learning is actually all about... hum...

From my side I think I also covered all the areas (IALP)... and as I said before... there is indirect and there is direct action... the indirect is when you hum... like in ask someone else to take the action..like for instance Teacher B in her lesson... she now asked the learners to come up with what action can they take and they came up with writing a letter to the traffic department asking their help... hum... regulating the traffic here in the mornings and the afternoons... hum... yet they... didn't write the letter yet... but is what action... the action that they going to take... the... Teacher 1... her learners decided they going to put up notices, signs that like at the taps... hum... like close the taps...

Yeah and for me it was now... I am going to... in the lesson I said we were going to ask... Mr... Write a letter to Mr... I also now probe them until they got to the point where they said they can write a letter... so I helped them there a bit... and telling them we can asked Mr N through a letter if he can plant carrots in his garden and also they can write a letter to the parents... to ask them to put in healthy foods for them... for break

Interviewee – Teacher 3

For break

Interviewer – Active Participant

For break and what was the other thing... oh yes... yeah that was the things... but then I also thought of if we going now to give the letter to Mr N, to also ask him in the letter if he could invite us once they're going to plant the carrots so that they can see how it is being done so that they can also see how so they can also learn though that... and yeah... that is what I thought... that is the next lesson that I wanted to do... but then thought I didn't do... and it was also exam time... we couldn't use the agriculture learners... so I am thinking of next trimester... maybe just one lesson... planning to ask Mr N for that... Yeah!

What can you do to overcome this/these difficulties or problems?

Interviewee – Teacher 3

I think just practice

Interviewer – Active Participant

Yeah, that also comes just... you took the words out of my mouth... just through practice... I thinking back when you were first introduced to the mathematics method... but now it's like... its two years and now it's like... you can do it closed eyes.... and were moaning about it but now we are reaping the... how do... they say it...

Interviewee – Teacher 1

Ooh, yeah... but now we can do it closed eyes in your sleep... **practice makes perfect... (WOD)**

Interviewer – Active Participant

Makes perfect.... **yeah for me it's also just practice... (WOD)**

Interviewee – Teacher 1

And I think that is also a good... but it's very good when you look at the four... the four... hum... steps that you have to take... they are all very... important in your lesson... because the learners really have to do all those four steps in order for them to get the lesson... even through them....

Interviewer – Active Participant

And also to be able to apply what they have learnt and to see that the theory that they are learning is actually applicable to how they live at home it is not something that is being kept in the classroom and I must just write a test about this... and what I also thought of is... you can actually use the... hum... the activities that they are doing as assessment with the test results that you are.... that you have to record... just to see how much of the knowledge are they really using

in their everyday lives... or you can maybe ask in your test... ask hum critical thinking questions where they have to tell what they have experienced and how they are using it at home apart from only testing the knowledge of the content.

Interviewee – Teacher 3

The content

Interviewer – Active Participant

Okay! Do you feel competent enough to present lessons according to this framework as a guide to present your lessons in the future or not? Hum and why? Okay, I think I feel competent but as we said now with the... previous question practice... I feel competent... I think I have it now under my knee... the four steps... it is now just practice and also hum... to be able to hum... how do you say... hum... the time... to be able to... hum... to be able to judge how much time am I going to use on the different activities... so sometimes you think it will take like in five minutes then it ends up taking like in twenty five minutes... that is also something that I need to work on... so that I don't like in waste time... of the learners... and I think also... what I can also do is to hum... to keep them engaged in the lesson because sometimes when... I don't know... sometimes when... like when the one was presenting the others were not like in interested... maybe it was because it was the first time and they weren't use to this kind of or way of teaching and they will also now with practice get use to it... now you need to listen... now you can quickly discuss with my friend... and they were very excited because they sitting here with their papers... they were just trying to look at each others... telling each other... no... I wrote this here... instead of listening to the person that was presenting... so I also think maybe with time... I think definitely they will also get use to this and that they will also get a turn and that everybody will eventually hear what the other one wrote or broad back of what they have enquired... (CAL) yeah!

Interviewee – Teacher 3

I also think with more time and practice I will be competent enough.

Interviewee – Teacher 1

Hum! Hum...for yeah... I also think I just need more practice.... more practice to be competent... I need to practice more... but I think this is a very good method... I will use it for my lesson presentations... (CAL)

Interviewer – Active Participant

So you will use it in the future for your lesson presentations.

Interviewee – Teacher 1

In the future... yeah, yeah!

Interviewee – Teacher 3

Yeah!

Interviewee – Teacher 1

I just need to practice more in order to... to be part of me... to make it...

Interviewer – Active Participant

Do you feel that hum... would you like to give another topic... present another topic in this way?

Interviewee – Teacher 1

No...

Interviewer – Active Participant

Laugh! Okay, to be observed...

Interviewee – Teacher 1

No, I will do it for my class now.

Interviewer – Active Participant

For your class but whenever need some help?

Interviewee – Teacher 1

I will come to you...

Interviewer – Active Participant

You will ask...

Interviewee – Teacher 1

Yeah, I will ask all of you because now all of us know how to do it.

Interviewees

Yeah!

Interviewer – Active Participant

Yeah, we have come to the end of the... to this session... if anyone of you still wants to say something...

Interviewee – Teacher 1

I think for me... the problem that I had... coming back again... it was... the way we normally present Environmental Studies and now we have to do it like properly... you know it was also part... playing a little part of me there... because the way we do it is.... we do it because of the time... we just explain to the learners... just to explain the topic and just to discuss the topic a little bit and then it is over now you have to do it according to the steps and you have to do it officially and professionally and everything... laugh... it was... laugh

Interviewer – Active Participant

Which was... which is actually the way that we should do it...

Interviewee – Teacher 1

Yeah, it is the way that we should do it but because of the time and everything we don't do it that way.

Interviewer – Active Participant

But I think the main thing here is that we are not taking the subject seriously...

Interviewee – Teacher 1

Subject seriously... yeah and now you have to do it seriously...

Interviewer – Active Participant

And now all of a sudden someone comes here with something that you can use... it kind of intimidating... you feel no I usually use this... something else... now why should I now waste it again with something... but in the end it is also a good way... and you see that it is working...

Interviewee – Teacher 1

Yeah, because I think that is really something worthwhile...

Interviewer – Active Participant

Yeah, that is just now... yeah that is the word that I was... couldn't get... just how to manage the time... because I was now seeing this Environmental Studies time I can't steal anymore... so now when I give my Mathematics lessons and when I give English lessons and when I give my Afrikaans lessons hum... for homework... I now like in... leave like five minutes of the period open... so I plan... I try and manage my time so that there is five minutes open of the lesson so that they can start recording their homework without stealing the Environmental Studies time.

Interviewee – Teacher 1

For me I am really stealing that... for me Environmental Studies... it's only I can teach in ten minutes... when they come from Ms B then it is already past... past twelve and then they have to

write down the homework... they have to look for pencils and their homework books after that it is maybe like in ten past... no twenty past... you have to teach Environmental Studies so what I normally do... I just explain and then... explain... IIII... introduce the topic... tomorrow we will discuss a little bit... we are waiting for the test and we will write the test the next day.... laugh...

Interviewer – Active Participant

So it is all about time management...

Interviewee – Teacher 1

Yeah, so... so because of that it just started to go out of my... my system... I didn't care about Environmental Studies anymore... it was not so important for me anymore...

Interviewer – Active Participant

Because of the demand of the other subjects

Interviewee – Teacher 1

Hmm, it was not so important for me anymore... what I mostly focus on is only Mathematics and English.... but I think it is very good... we have to take our Environmental Studies very seriously... learners learn a lot from this subject...

Interviewer – Active Participant

The one thing that I want to ask you now is that... while we wait till Teacher 2 is coming back because so everybody can just hear what her views are about the questions.... So Teacher 2 while you were out we went on with questions 2, 3, 4 and 5 and just now to get your... also your view on... how you experienced the active learning framework on the rest of the questions. What difficulties have you encountered when you planned your lessons according to this framework and why? Planned!

Interviewee – Teacher 2

Hmmm, when I planned my lesson...

Interviewer – Active Participant

Wait, wait

Interviewee – Teacher 2

It was a little bit of a hum... not usual because I had to consider the whole setup of the framework which hum normally when we prepare it is more or less the same thing but here I have to consider of including all the four... four hum active learning so to say whereby I have to... realise which one will be an issue and hum which action will I be expecting from the kids... all those things hum it was not much a new thing though there are only a few things that I have to look at or consider in my lessons just like have mentioned hum it also hum enquired critical thinking... for me to reason... of if I am going to present a lesson like this will they be able to take action from that (DELP)... yes...

Interviewer – Active Participant

Hmmm! Have you covered all the areas of the active learning framework during your lesson presentations or not and why?

Interviewee – Teacher 2

I wouldn't say yes or not because I need somebody to tell me that (IALP)... hum but I don't think...

Interviewer – Active Participant

From the way that you see... if you look at now sharing information was there a part in the lesson where they shared information? (IALP)

Interviewee – Teacher 2

Yes! (IALP)

Interviewer – Active Participant

Then enquiry of course they did because they you gave them the homework to go out into the road to see what is happening there according to what taught them what is wrong and right and then they came back, they reported back and they also took action because they said they going to send a letter to the traffic department asking them to come and regulate the traffic here in the mornings and the afternoons to see everything is going smooth here in front of the school the parking so I think it is all of them... you have covered it. (IALP)

Interviewee - Teacher 2

Yeah, hmm (IALP)

Interviewer – Active Participant

What can you do to overcome this/these difficulties.... no, where am I...

Interviewee – Teacher 2

It is number 3 now....

Interviewer – Active Participant

What can you do to overcome this/these difficulties or problems?

Interviewee – Teacher 2

Hum even the problem of hum the problem of number two I must just get used to the idea of hum active learning hum I think I must just get use of the idea that when I prepare I must include all these four setups... (WOD)

Interviewer – Active Participant

So would you say with practice hum practice... more practicing this would help you to...

Interviewee – Teacher 2

Yeah, more practice and with more lessons of the same that include these four steps... yeah if I prepare every lesson in this way I would get use of the idea and it will easier..

Interviewer – Active Participant

Do you feel competent enough to present lessons according to this framework as a guide to present your lessons in the future or not and why?

Interviewee – Teacher 2

I do, I do feel competent because in doing so it will be... it will be more learner-centred education, which means I won't be doing much talking... the whole class the learners and myself will be involved in the lesson... because it give us the opportunity to explore... to enquire what we are looking for... yes I think I will be competent to present this kind of a lesson... (CAL)

Interviewer – Active Participant

Would you feel comfortable in presenting another topic like this to be observed? It can be any other topic...

Interviewee – Teacher 2

Yeah,

Interviewer – Active Participant

To be observed or will you still think about it...

Interviewee – Teacher 2

Yeah,

Interviewer – Active Participant

Will you think about it or is it a yes you can come?

Interviewee – Teacher 2

Laugh! I will think about...

Interviewee – Teacher 1

That is also what I have said... I just want to rest... laugh

Interviewer – Active Participant

But you will continue using this framework as a way to present your lessons but you just don't want to be observed.

Interviewee – Teacher 2

Yes, I will, I will really...

Interviewer – Active Participant

You will come for help if you are stuck?

Interviewee – Teacher 2

I will come, I will definitely, I will come because I have seen how the learners enjoyed the lesson... with this framework...

Interviewee – Teacher 1

Enjoyed!

Interviewer – Active Participant

Okay, so then Teacher 3 I think it is only the two of us... next trimester...

Interviewee – Teacher 3

Yeah!

Interviewer – Active Participant

And I think

Interviewee – Teacher 1

And you even learn from them... when they go and enquire you were learning...

Interviewee – Teacher 2

Can you imagine you were learning from them you will learn the information from them...

Interviewee – Teacher 3

Sometimes they even ask you questions that you also don't know the answers

Interviewer – Active Participant

The main thing that I saw is really the lack of knowledge content. That is the main difficulty with me. The lack of knowledge content because for nutrition I had to now go and enquire myself. I had to do research on what foods are healthy what foods are unhealthy hum for what are these food types what is it used for... what hum how does the body use this and I also learnt a lot through that but I think the main thing... if, if... if hum when I received my training if went into depth about the knowledge content of all the topics of Environmental Studies then I would also felt competent in just presenting my lessons according to this framework because I am

competent in what know and I have a good background knowledge on everything that I am suppose to teach but now I am just feeling like and empty vessel.

Interviewee – Teacher 2

Hmmm that is the duty of the teacher to go through every topic and go...

Interviewee –Teacher 1

Into depth and to find out and like us what we normally do we just take a topic but we don't go and do research, more research about the topic.

Interviewer – Active Participant

Do you think it will work if you also compile a theme books like for Afrikaans, Mathematics and English...

Interviewee – Teacher 2

Yeah, I think so...

Interviewee – Teacher 1

To get all the information of about the topic... we can even....

Interviewee – Teacher 2

Hmm it will be much easier, it is true

Interviewer – Active Participant

So you think it can be something that we can look at for in the future

Interviewee – Teacher 3

Yeah!

Interviewer – Active Participant

Taking it to the principal

Interviewees

Hmmm

Interviewer – Active Participant

I think than we will also feel more competent in presenting our lessons...

Interviewee – Teacher 3

Like for people like me who never had Environmental Studies... yeah it will be good.

Interviewer – Active Participant

Okay, thank you so much everybody it was good doing this with you and I hope that the writing up will also go that well... laugh... because this is the most difficult part of everything, making sense of what... the data that you have generated.

Interviewees

It's true

Interviewer – Active Participant

OkayEnd...

Appendix D: Coded transcript of Individual Interview 2 – Teacher 3

Interview 2 - With Teacher 3

Interviewer

Okay, good afternoon Ms Smith.

Interviewee

Good afternoon

Interviewer

We're just going to have a short interview session about your own reflection about the active learning framework. So the first question I want to ask you is what is your personal feeling of presenting lessons according to the active learning framework and why?

Interviewee

Hum... I would say it is a good idea or a good approach... because it allows learners to be more active in class rather than being passive. And when you are active you learn more than when you are passive. (VALP)

Interviewer

Okay... What difficulties have you encountered when you planned your lessons and why? This is now the planning... when you worked out your lesson.

Interviewer

The most difficult part was... hum... finding an activity or creating an activity for my learners because sometimes learners know things which they are not suppose to and then you think learners know things which they don't know. So... sometimes there is a lot of planning when it comes to the activity to give your learners. (DELP)

Interviewer

So what you actually saying are maybe you planned an activity of what the learners already know instead of planning something that they don't know which they actually need.

Interviewee

Yeah

Interviewer

Hum... have you covered all the areas of the active learning framework during your lesson presentations or not and why.

Interviewee

Yes I have covered all the areas. (IALP)

Interviewer

What can you do to overcome these difficulties... problems that I have asked about in question 2?

Interviewee

I think hum... is to have a bigger or a larger time frame for the information seeking part so that you know exactly what your learners know in order for you to plan your activity. (WOD)

Interviewer

Okay... do you feel competent enough to present lessons according to this framework as a guide to present your lessons in the future or not and why?

Interviewee

Yes I think I feel competent... because it is rather easy working with what you get from the learners instead of starting from the start and doing things that the learners already know... so I think I am competent enough. (CAL)

Interviewer

You will be able to do your own... you will be to do active learning on your own...

Interviewee

Yes

Interviewer

Planning and presenting lessons according to this framework...

Interviewee

Yes

Interviewer

Yes... I also think that you are competent... the way that I have observed you... yeah... and actually went well...

Interviewee

Yeah

Interviewer

From the start till the end

Interviewee

And even since the first time... I just continued using this approach... (CAL)

Interviewer

Yeah... you think it is working

Interviewee

It is working (CAL)

Interviewer

It is good...

Interviewee

Yeah

Interviewer

Okay... thank you very much for your time Ms Smith. We have come to the end of this hum reflection interview.

Interviewee

It is a pleasure...

End...

Appendix E: Assessment results Grades 1-3

Grade 1 – Assessment results worksheet 1

Marks	Number of learners who achieved this mark
0-1 (17%)	1 learner achieved this mark.
2 (33%)	None of the learners achieved this mark.
3 (50%)	None of the learners achieved this mark.
4 (66%)	2 learners achieved this mark.
5 (83%)	9 learners achieved this mark.
6 (100%)	25 learners achieved this mark.

Grade 1 – Assessment results worksheet 2

Marks	Number of learners who achieved this mark.
0-1 (17%)	1 learner obtained this mark.
2 (33%)	1 learner obtained this mark.
3 (50%)	6 learners obtained this mark.
4 (66%)	6 learners obtained this mark.
5 (83%)	12 learners obtained this mark.
6 (100%)	13 learners obtained this mark.

Grade 2 – Assessment results

Marks	Number of learners who achieved this mark
0-1 (10%)	None of the learners achieved this mark.
2 (20%)	None of the learners achieved this mark.
3 (30%)	1 learner achieved this mark.
4 (40%)	None of the learners achieved this mark.
5 (50%)	6 of the learners achieved this mark.
6 (60%)	1 learner achieved this mark.
7 (70%)	8 of the learners achieved this mark.
8 (80%)	9 of the learners achieved this mark.
9 (90%)	2 learners achieved this mark.
10 (100%)	12 learners achieved this mark.

Grade 3 – Assessment results

Marks	Number of learners who achieved this mark.
0-1 (5%)	None of the learners achieved this mark.
2 (10%)	1 learner achieved this mark.
3 (15%)	2 learners achieved this mark.
4 (20%)	1 learner achieved this mark.
5 (25%)	2 learners achieved this mark.
6 (30%)	3 learners achieved this mark.
7 (35%)	1 learner achieved this mark.
8 (40%)	None of the learners achieved this mark.
9 (45%)	1 learner achieved this mark.
10 (50%)	4 learners achieved this mark.
11 (55%)	3 learners achieved this mark.
12 (60%)	4 learners achieved this mark.
13 (65%)	4 learners achieved this mark.
14 (70%)	4 learners achieved this mark.
15 (75%)	4 learners achieved this mark.
16 (80%)	2 learners achieved this mark.
17 (85%)	1 learner achieved this mark.
18 (90%)	None of the learners achieved this mark.
19 (95%)	None of the learners achieved this mark.
20 (100%)	1 learner achieved this mark.

Appendix F: Analytical memo 1

ANALYTICAL MEMO 1 (Inductive analysis)

This analytical memo was done to draw on information speaking to the second goal of the research question. Themes and sub-themes were created according to what emerged from the data.

CATEGORY 1: Environmental Studies Curriculum

Sub-categories	Comment	Source
Importance of Curriculum ES	Environmental Studies is the main carrier subject and all subjects should be integrated from Environmental Studies. A topic should be taken from Environmental Studies and should be integrate into the rest of the subjects.	IT1 (p. 1)
	It is part of the curriculum because we have it in class as a subject. It is present on our timetable throughout the year and learners are assessed in this subject as well.	IT2 (p. 1)
	It gives them a broader picture of a healthy lifestyle and to obtain more knowledge about what is going on around them,	IT3 (p. 1)
	What Environmental Studies does for me is, it gives them a picture of what is going on around them in their environment and how they can help themselves with these natural resources that they have and what they should do with it. That is what it gives to me.	FG1AP (p. 2)
Learners benefit from this subject	The learners can benefit a lot from Environmental Studies because the subject includes the environment and therefore will learn about the different things that make up the environment. For example how to keep them clean, how to keep them environment clean and how to take care of the environment.	IT1 (p. 2)
	From my observation the learners benefit a lot from this subject because it is more about the environment, where they live, what they go through and what they see every day. Even though they see and live with all these things around them they are not learning much about it at home but in class we teach them, explore with them and explain in more detail why they see these things around them at home.	IT2 (p. 1)

	It can broaden their general knowledge because their knowledge is sometimes limited. Then there are also those learners who will go and find out more than what they do in class.	IT3 (p. 3)
	From my point of view, I will only say that they can benefit. Through getting information and being made aware.	FG1AP (p. 3)
Approach to teaching and learning	The approach that I normally use from the curriculum is the new approach that is the learner-centred approach whereby you should include the learners in the lesson. It is not like the teacher-centred approach that we normally used in the old days. We now use the method of learner-centred education, whereby in most steps of the lesson the learners are involved. The learners will take part by doing research. They will give their own understanding of the topic and you will find out answers from them.	IT1 (p. 2)
	There is a prescribed method that one has to follow in the curriculum. We mostly have to do research on the topics that are in the curriculum. The learners have to go and find out about a topic and we as teachers have to explain to them what the topic is about so that they will be able to relate the information of the topic to how they live at home.	IT2 (p. 1-2)
	There is no prescribed approach that we need to follow as long as we can transfer the knowledge to the learners.	IT3 (p. 3)
	In the curriculum is stated that we are advised to use a learner-centred approach but there are different ways on dealing with the learner-centred approach. Sometimes you will have to transfer knowledge. Sometimes you will do group work and let them discover the knowledge or in pairs or you will send them out to seek for information, come back with the information and sometimes you will just lecture them because there are facts that they really don't know about. You just need to do the lecture method. Where you are now the expert and they are now the receivers of the knowledge.	FG1AP (p. 3)

Training received to implement this subject	I cannot remember of any training that I have received, besides from the training that we have received at the college. At college we were trained to understand that Environmental Studies is the main carrier subject and therefore we were taught how to integrate Environmental Studies into the rest of the subjects.	IT1 (p. 2-3)
	I didn't receive much! I have learnt myself that to be successful in this subject I have to do research as I have mentioned before. For example, if I give the learners a topic I also go and do research myself. I do research through my surroundings, whereby I ask questions. I also interview people about the specific things that I see, although I don't know much about it and by doing that I learn more from them.	IT2 (p. 2)
	I didn't really receive any training on this subject because I am not qualified in the Lower Primary Phase (Grades 1-4) but am qualified in the Upper Primary Phase (Grades 5-7)	IT3 (p. 3)
	Even though we got training on this subject. We were not actually trained on how to implement this subject effectively. From my point of view I didn't get the content knowledge that I need to teach this subject and also a method that you can use on how to implement this subject.	FG1AP (p. 4)

CATEGORY 2: Lesson presentations/Methods & Strategies

Sub-Categories	Comments	Source
Introduction of lesson	My introduction of the topics varies according to the different topics. Sometimes I start my lesson with a rhyme, sometimes a song sometimes I will introduce the topic by doing a role play.	IT1 (p. 3)
	Most of the time I start my lesson by asking questions. Specifically about the topic to get an idea about the learners understanding of the topic to get an idea whether I should start with the known or the unknown of the topic.	IT2 (p. 3)

	I first ask questions about the topic which they have to go find out at home. The questions will be to go and find out what the topic is about to see what their understanding is about the topic.	IT3 (p. 3)
	It's just to ask questions, see what the level of their knowledge are about the topic and then I will also just start lecturing them the content.	FG1AP (p. 4)
Methods and strategies used to present the content of the lesson	I will mostly let the learners be more involved in the lesson. After the introduction I will explain the topic to the learners and then let them put up flashcards to test their understanding of the topic. During the explanation process I usually ask them questions as well as to make them part of the lesson.	IT1 (p. 3-4)
	I mostly use pictures or concrete materials when teaching the content of the lesson to the learners. For example when teaching the National Flag as a topic I use the picture of the flag itself to demonstrate how it should be put up and from there I explain what each colour represents.	IT2 (p. 3)

	I usually let them discuss the topic in groups or in pairs but I mostly use group work. After the discussions in their groups or pairs they have to give feedback on what they had to discuss and from their feedback I construct my own notes to give to them. This is done to ensure that they get all the content knowledge. So I first find out what they know from their discussions and then I add to what they don't know according to the topic.	IT3 (p. 4)
	I can't actually let them work in groups. Just here and there some topics. For Grade 1 it is just like you should take the lead all the time. The only way how I can ask them to work in groups is when they have to draw something.	FG1AP (p. 5)
Does methods and strategies allow learners active involvement	Yes, it does because at the end of the lesson I will let them come and put up flashcards on the board and sometimes they also have to write on the chalkboard and do the written work later in their writing books as well.	IT1 (p. 4-5)
	Yes, it does a lot because they participate more with the knowledge that they have. Although they don't know more in detail about the content of Environmental Studies they have the knowledge, it is just that they don't have the details of the content.	IT2 (p. 4)
	Yes, because they have to discuss and sometimes I let them decide who can be the group leader but sometimes I also decide who can be the group leader so that everyone can be active. Sometimes not all are actively involved in the group work process but if I let them work in pairs then only they will give their input as well.	IT3 (p. 5)
	Now what I have learnt about active involvement, especially with the learner-centred approach we want the learners to be busy and let them do something but are they really learning something from what they are doing?	FG1AP (p. 6)
Conclusion of	After finishing the topic or the lesson of the day I	IT1 (p. 5)

lesson presentations	will normally give them a worksheet to do at their tables or they have to work in groups.	
	Most of the time I will always ask questions at the end of the lesson. After that I will give them a task to complete at home and bring back the answers to me. I prefer asking them questions in class then giving them a task to do at home because in class I know that the answers are their own rather than the task that is done at home where answers might be coming from the parents. So for me to send a task home is to get knowledge from them and to ask questions in class is to test their understanding of the content taught to them.	IT2 (p. 4)
	I just ask them a few questions. Specifically those who don't pay attention in class. To make sure whether they understand the subject content. There after I will give them a written activity or a worksheet to complete.	IT3 (p. 5)
	I just give them a worksheet or just give them questions. I can hardly actually give them questions that they can complete on their own. I must work through it with them so that they can understand what they are supposed to do by guiding them through the questions.	FG1AP (p. 9)

CATEGORY 3: Knowledge

Sub-Categories	Comments	Source
Learners application of knowledge in everyday life	Yes, they normally do apply the knowledge what you have taught them in their everyday lives because mostly for the young ones they will remember what you have taught them for life. So mostly they will really try to practice what you have taught them in their daily lives but there are also the ignorant ones that don't practice what you have taught them. For example if you teach them about water you will teach them not to waste water. After I have taught the topic I notice that there are no more dripping or running taps. If you go into the toilet you will see that no taps are dripping anymore. You will also find the ignorant ones but most of them will know that the tap is dripping they need to go and close it for the others who are ignorant.	IT1 (p. 5-6)
	I believe they will be able to apply it because I have seen some applications taking place especially on the hygienic matter. When we teach them about how to keep them clean, we see the results personally that they have now moved from how they have behaved before the topic and after the topic.	IT2 (p. 5)
	Yes, I have seen that because in the first topic which was about 'the five senses' they really applied it in their English theme. They really integrated the subject content learnt in Environmental Studies into the English lessons. When I did the topic about HIV-AIDS I ask them to role play how they will treat a person who is infected with HIV-AIDS and some of them avoided the person who played the role of the infected person and then there were also those who avoided the person who played the role of the infected person and then there were also those who really tried to care for the person. So I think that they will be able to apply the knowledge what they have learnt in their everyday lives.	IT3 (p. 6-7)
	Yes, I also think so because sometimes they do sometimes they don't. It depends on how familiar they are with what you are teaching them. If it is something that they are not familiar with and they are not practicing it.	FG1AP (p. 10)

Does the knowledge acquired help learners understanding of sustainability	Yes, they will understand it because most of the topics really teach them how to sustain. For example to sustain water and to keep them clean and so on.	IT1 (p. 6)
	It will help them a lot because we teach them the importance of what we have in the environment and why we should sustain it. The use of the future, the use of tomorrow. It is not that we use something for today and get finish with it but to keep it for the next use as well and the next generation	IT2 (p. 5)
	I think only some learners will be able to because there are those who really struggle but they try their best every day.	IT3 (p. 8)
	No response	FG1AP
Learners reaction towards the lesson	They enjoy the lesson and are positively involve in the lesson. If you give them something to go and do at home, they really go and do what you have taught them or what you have told them to do or if you tell them go and find out something they will bring back the feedback what you have ask them.	IT1 (p. 7)
	The learners enjoy the lesson very much because it is something in relation to what they live with. They are very much involved and they participate a lot.	IT2 (p. 5)
	Sometimes the learners seem to be really interested. For example when I taught the topic living and non-living organisms to them. At first they were not interested but then the next day when some of the learners came back with the answers which they had to go and find out the others also became interested because it was about the characteristics of living organisms and they really enjoyed it.	IT3 (p. 7-8)
	No response!	FG1AP

CATEGORY 4: Difficulties

Sub-Category	Comments	Source
Difficulties encountered during presentations	I don't actually experience any difficulties apart from the limited time that we have.	IT1 (p. 7-8)
	I encounter discipline problems because every learner wants to participate at the same time because they feel they will be left out or they will go home with the answer or the contribution that they wanted to say because the time is limited and everyone just want to say something and sometimes it is a bit of discipline not in place. This actually happens because of the limited time that we have for this subject.	IT2 (p. 5-6)
	Sometimes I really don't know what teaching aids (learning support materials) to use to make the content more clearly to the learners.	IT3 (p. 9)
	For me it is also the time and also a lack of subject content. For also a lack of methods because I am working with small learners and I tend to just move into the method of rote learning all the time because it is small learners and you can't work with them like in smaller groups. Especially in the beginning of the year when you must still guide them with every single thing.	FG1AP (p. 12)
Why these difficulties are experienced	I don't actually experience any difficulties	IT1 (p. 8)
	I think it is because the subject is so enjoyable and the learners tend to think it is something that they know and they want to take over the whole situation. They even want to stand up and teach the others.	IT2 (p. 7)

	Maybe it is because I didn't receive any training because I didn't specialise in Lower Primary. When I got here they just told me that I should also teach Environmental Studies.	IT3 (p. 9)
	The time is not there and what also happens with me is that I steal the time of Environmental Studies for my Languages and then there is only twenty minutes left and for me it's just to do a quick, quick something.	FG1AP (p. 13)
How these difficulties can be overcome	As I said before I don't actually experience any difficulties so I don't have any answer to this question.	IT1 (p. 8)
	Mostly with the discipline problem that I have mentioned, I feel that it will be difficult because the subjects are already stipulated on the timetable and with the time I feel that Environmental Studies should have more open time in the afternoon. Whereby the teachers and the learners go out and do research. Have time to talk about things altogether with enough given time before coming to the class.	IT2 (p. 7)
	I should just plan in advance to avoid getting stuck and if I would get training on the subject it would definitely also be helpful.	IT3 (p. 10)
	No response	FG1AP

Appendix G: Example of a mini case story

MINI CASE STORY (Grade 1)

GRADE 1

1. Context

The lesson played off in an urban school situated in Windhoek Namibia. The learners that took part in the lessons are about 6-8 years whereby the majority of the group turns 7 during the school year. The group is multi-cultural whereby the language of teaching and learning is English Medium of Instruction. Although the Medium of Instruction is English, English to most of these learners is a second or sometimes third language.

The lessons were based on active learning processes with the use of an active learning framework to plan and present lessons.

2. Focus area of issue/risk/concern/problem

The focus area of this particular lesson was about the topic Nutrition. Here the teacher wanted to teach the learners how much food is consumed by humans and the importance of healthy food. Furthermore what food types are necessary for a healthy body with the main aim on how to keep our eyes and teeth healthy? Weak eye-sight and rotten teeth was picked up by the nurses in the beginning of the year during their yearly health examination done on grade 1 learners. The teacher decided to teach the learners the importance of eating healthy food in order to keep our eyes and teeth healthy and what food types should be eaten and what can be done to sustain this. (FA)

3. Lesson objectives and introduction of lesson

- Understand better how livelihoods are dependent on the environment
- Collect, classify, analyse and interpret data
- Organise, plan, implement and monitor an environmental project
- Encourage a sense of personal and social responsibility and a desire to work co-operatively with others on an environmental issue. (lp1)

The teacher introduced the lesson by asking learners questions to stimulate their background knowledge. *What do you do when you are hungry* (LOT1.1, p.1)? One learner answered *eats* (LOT1.1, p.1). (BK) The teacher replied *we eat* (LOT1.1, p. 1). She asked another question.

What do we do when we are thirsty (LOT1.1, p. 1)? All learners answered *we drink* (LOT1.1, p.1). (BK) The teacher replied *we drink* and asked; *now what do we eat?* (LOT1.1, P.1) The learners replied *food* (LOT1.1, p.1). Then she asked them; *now what food do you like?* All learners gave one or other food type. Learner 1 said, *eggs*; learner 2 said, *rice*; learner 3 said, *spaghetti*; learner 4 said, *macaroni*, learner 5, *salad*; learner 6, *rice*. The teacher then said *we already said rice; don't say something that was already said by someone*. Learner 7, *pudding*; learner 8, *corn flakes*; learner 9, *ice-cream*; learner 10, *custard*; learner 11 said *chocolate* (LOT1.1, pp. 2-4). (BK)

Thereafter the teacher said; *okay now that's enough* and asked the question; *now what do you like to drink when you are thirsty?* Learner 1, *cool drink*; learner 2, *oros*; learner 3, *tea*; learner 4, *juice*; learner 5, *yoghurt*; learners, *coke*. (BK) The teacher said *okay coke, thank you, that is enough*. Another learner shouted *water* (LOT1.1, pp. 4-7). (BK) The teacher then asked the learners to put down their hands. She told them, *so we drink different things*. *Now where do we get these drinks and food from* (LOT1.1, p.7)? The learners gave different answers and eventually one learner answered *we sell, we must sell from the plants* (LOT1.1, p.9). The teacher said *from the plants. Yes, what we get from plants*. The learners gave different answers such as *bread, vegetables, apples, carrots, oranges, pears and bananas* (LOT1.1, p. 9-10). The teacher said *so we get fruit. What else do we get from plants? Don't give me another fruit name again, other things* (LOT1.1, p.10). One learner answered *vegetables*. (BK) The teacher said *vegetables, okay. Vegetables and fruit we get from plants. What else?* The learners named different fruit and vegetable names again such as; *grapes, cabbage, carrots* (LOT1.1, p. 10-11). The teacher asked them; *what other food do we get from plants apart from fruit and vegetables* (LOT1.1, p.13)? The learners still gave fruit and vegetable names such as; *mango and carrots* (LOT1.1, p.14). Then the teacher said; *that is a vegetable, you are not listening. Okay listen, let's help him to understand. If there is no fruit and there are no vegetables, what else can you eat? What other food can you eat?*

What do you have in the mornings? What do you eat in the mornings (LOT1.1, p.14)? One learner answered *bread and tea* (LOT1.1, p.14). The teacher said; *bread and tea, so that is another food type* (LOT1.1, p.14). *So teacher is asking for other food like bread and tea* (LOT1.1, p.15). One learner answered *porridge*. Another learner said *biscuits* (LOT1.1, p. 15). (BK)

The teacher said; *okay now apart from bread and corn flakes; what else can we eat?* **What do you have for supper?** (BK) One learner answered *cake*. The teacher said; *okay we are not having cake for supper. What do we eat in the evenings? What is your mother preparing for you?* One learner said *wheat bix*. The teacher said; *Wheat bix! Don't you think you must eat that in the mornings? What do you eat at night?* One learner said *food*. Then the teacher said; *Yeah we all know we eat food but what do we eat? What food type?* Now only the learners began to understand because **the learner said rice**. The teacher said *rice. With what do we eat the rice?* A learner answered *soup*. The teacher said *yes, what else?* A learner answered *meat*. Then the teacher asked them; *what different meat types do we get?* The learners answered *chicken, dry sausage and fish* (LOT1.1, pp. 16-18). (BK)

4. Information sharing and seeking

The teacher started this process by showing learners a poster with different food types. She said to them **now I want to show you different food types that we get. I want you to name the different pictures. The food pictures that you will see here on the chart** (LOT1.1, p.18). (ISS)



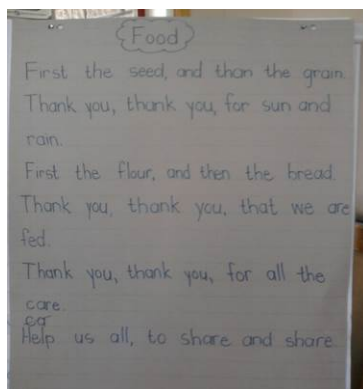
She did this to see if they know the different food types names. **She pointed to the first picture and said now this here** (LOT1.1, p.18) One learner answered *meat*. The teacher said *it is meat. I am going to write down all the different foods. Okay and this?* The teacher pointed to all the different pictures and the learners could identify it.

The learners answered *cheese, bananas, juice, milk, oranges, tomatoes, porridge, pine apple, pumpkin, water melon, carrots, apple, beans, cookies, biscuits, chips, cool drink, peanuts, pop-corn, sweets, cake, chocolate and ice-cream*. After all the food names were named the teacher said **now let's read all the names, come all of us** (LOT1.1, pp. 19-29). The teacher read the food names to the learners and they had to repeat it after her. (ISS)

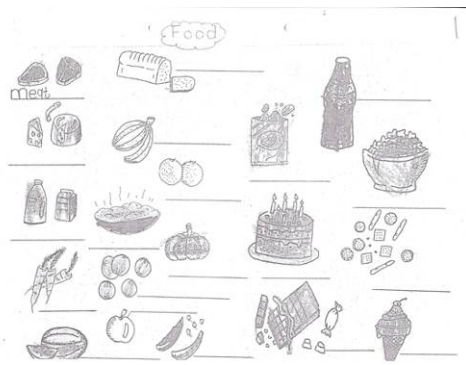
The teacher asked them **now all the food we get from what? Who can still remember** (LOT1.1, p. 34)? One learner answered *trees*. The teacher said *plants. Yes, trees*. (ISS) One learner shouted *garden*. The teacher said *yes, the trees and plants are in the garden*. Then she asked them **where do we get the meat from?** The learners shouted *shop*. The teacher said *yes, but*

before it goes to the shop, where? One learner interrupted and shouted from the animals (LOT1.1, p. 35). (ISS) The teacher said so we get from plants and. Then the learners answered animals. She then said so all the food we get from plants and animals, (ISS) let's say it again. The learners together with teacher said plants and animals. Then she asked them now what if there are no plants and animals? What will happen? (ISS) One learner answered zero. Another learner answered you will feel hungry. The teacher replied you will feel hungry and then what? (ISS) One learner shouted and then the plants will grow. Then the teacher asked her when you feel hungry will the plants grow? She said no. The teacher said no, you are not thinking. Okay, when you feel hungry and then? One learner answered we must put seeds in the ground for the food to grow. The teacher said yes, she said we must put seeds in the ground for the food to grow. Yes, and that is right but how will we help the plants to grow? What will we use? All learners shouted water. (ISS) The teacher said we will use water and if there is no water? One learner answered rain. The teacher said we will get the water from the rain (LOT1.1, pp. 36-38).

The teacher said to the learners okay now I want to teach you a rhyme about food. (ISS) The teacher asked them about? The learners replied food (LOT1.1, p. 38). The teacher told them that the rhyme is about how we get the food just like you have told me. So everybody must just pay attention here (LOT1.1, p. 39). (ISS) The teacher first read the rhyme that was displayed on the poster to the learners.



The teacher read and the learners repeated after her. Thereafter the teacher explained some words to the learners in the rhyme. She said now grain is a type of plant that we get. They work it so that it can become fine so that we can make bread with it. So it first comes from the seed, than it becomes a plant that is called grain. Then they like crush it. They make it fine so that they can make bread out of it. So it is a long process, you see. So let's say it quickly. First the seed, and then the grain; thank you, thank you for sun and rain; first the flour, and then the



The teacher gave another instruction to the learners *and then the last thing is you remember the paper I gave you on Thursday the homework*. The learners replied yes. The teacher said so now tomorrow we're going to look at that paper. So you must be sure that you are prepared. That your parents completed all the answers and that you are ready to come and present it. You must be able to read to us the answers to the questions (LOT1.1, p. 48). (ISS)

The teacher first revised the previous day's work before starting with the feedback of the enquiries the learners had to do at home. The enquiry was based on a questionnaire.

Dear parents

I would like you to help your child to complete this questionnaire as an aid to teach them about the topic 'nutrition'. The information written in this questionnaire should be based on the truth and nothing but the truth. You should help your child to fill in the answers and also to present the information in class. This will count as an assessment mark for

data collected and presented. To be presented Wednesday 11th of April. This will be the only date for presentations if the data is not collected and presented on this date your child will fail this assessment.

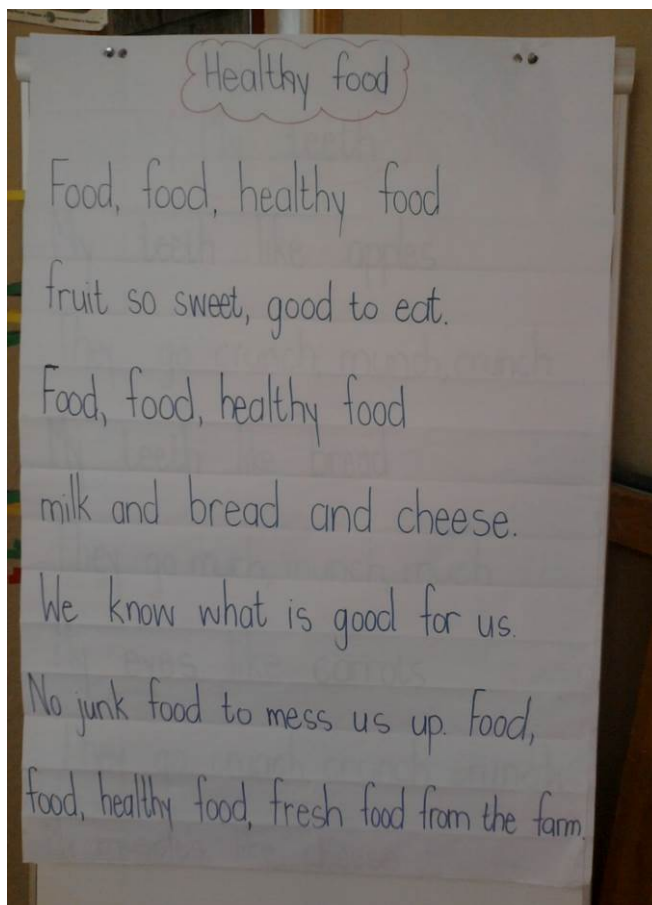
Thanks for your co-operation!

Ms Jacobs (grade 1B class teacher)

Name of child:

Questions	Answers	
1. What do you eat for breakfast?		
2. What do you eat for lunch?		
3. What do you eat for dinner?		
4. What food types do you like the most?		
5. What food types do you like the least?		
6. What fruit types do you like the most?		
7. What vegetable types do you like the most?		
8. What sweet things and snacks do your child like the most? Eg. Sweets, ice-cream, cookies, cake, chips, chocolates, etc.		
9. How often does your child eat this? Eg. Every day, once a week, once a month, etc.		
10. Are you allergic for any food types? If so, what it is?		

The learners had to complete this questionnaire with the help of their parents. The teacher gave the learners enough time to complete this so that the learners and parents could have enough time to complete it and for the learners to rehearse in order to present it in class. The teacher started off by saying *I also give you already Thursday this paper, so that your parents could have time to complete it with you and also to practice it with you and yesterday it was also homework again to make sure that you know what you going to present.* (EN) One learner shouted *teacher can I be first?* The teacher said *no you wait.* *Before we present our questions and the answers or only the answers I want to do this rhyme with you and it goes like this.* *Healthy food* The teacher read the rhyme to the learners and they had to repeat it after her. (EN)



The rhyme goes like this. *Food, food, healthy food; Fruit so sweet, good to eat; Food, food, healthy food; Milk and bread and cheese; We know what is good for us; No junk food to mess us up* (LOT1.2, pp. 4-7). (EN)

The teacher asked questions about the rhyme. *Now in the rhyme they are talking about healthy food. What do they say in the rhyme what are healthy food?* One learner answered *cheese*. Another said *apple* (LOT1.2, p. 7). The learners named several healthy food types. The teacher

asked them *did they talk about apple in the rhyme*. Some learners said *no* and some said *yes*. Then the teacher said *no, they talked about fruit but they don't say apple they only say fruit. They say bread, milk, cheese. Okay on which side of the poster are those foods?* One learner said *the bread is there* (showing to the side of the poster where the bread is) (LOT1.2, p. 10). The teacher said *on this side. So it is on the healthy side. And who can tell me the foods that are junk food that they talk about in the rhyme; junk food to mess us up, so they say that the junk food is messing us up. So what will the junk food be?* The learners gave many different names of junk food such as; *cool drink, cake, chocolate, ice-cream, sweets, chips and pop-corn* (LOT1.2, pp. 11-12). Then the teacher asked them *now another word for junk food, if food is not healthy, it is how?* One learner answered *bad*. The teacher decided to help them with this and said *it is called unhealthy* (LOT1.2, p. 13). The learners had to read this word several times by looking on the poster. They also had to read the word *healthy* on the poster several times.

The teacher went on by saying *okay before we talk about what healthy and unhealthy food do to our bodies we can start with our presentations. Each one will come and stand here. This will take a little bit long maybe till tomorrow. (REP)* The teacher called one learner to the front to present his questionnaire to the rest of the class. The teacher decided to ask the questions to the learner and he had to answer what he wrote in the questionnaire. The teacher did this with more or less 10 learners whereby some of the learners could do it perfectly well and others couldn't present what was in the questionnaire. This was the end of the period (LOT1.2, pp. 15-42).

(REP)

She then decided to collect the information in another way. She wrote the questions of the questionnaire on the chalkboard in table form with all the different food types that might be eaten under it. She explained it to the learners in the following way *so yesterday we stopped at the presentations.*

It is going to take too long for each one to present individually and we need to complete this work because of the time that is limited. So I will also give the others a chance to present this individually. So this we can do this in the English period for oral those who didn't presented individually. But for today to get the information I made a table on the board where we can just put up our hand if we had bread for breakfast or wheat bix and then I count how many we are that are eating bread and I write the number down. So I can put it in a graph form and tomorrow we continue to see what the outcome is or to see how much food we are consuming.

(EN) *But before we go on to that let's say the rhyme quickly that we have learnt yesterday. The learners repeated the rhyme 'healthy food' after the teacher (LOT1.3, p. 1).*

Thereafter the teacher did revision by asking questions about healthy food and unhealthy food. She started off by saying *okay, so now yesterday we saw what healthy food and what is unhealthy food. So now what we want to determine by this is to see how much healthy food we are eating and how much unhealthy food we are eating. So in the rhyme what type of food do they mention here?* One learner answered *bread*. Then the teacher said *but what is it? Is it healthy food or are they mentioning healthy food or unhealthy food?* Learners answered *healthy food*. Then she asked them *now what will be unhealthy food?* Learners gave several unhealthy food names such as *cake, cool drink, chocolate, pop-corn and ice-cream* (LOT1.3 p. 5-7).

Then she asked the learners now we can look at number one on our papers. Everybody, quickly, okay now who wrote bread for breakfast? Okay let's quickly see. If you didn't write bread, don't put your hand up (LOT1.3, p. 7). She counted the hands that were up and wrote down the number that was counted. This was done until everybody's information on the paper was collected by writing it on the chalk board in the table. The teacher then said to them *okay now for tomorrow I will come and show you the graph with all the different food types that we are eating. What we eat more than the other. And I am going to show you if we are eating the healthy food that we should or not and what we can do about it* (LOT1.3, p. 27). **(REP)**

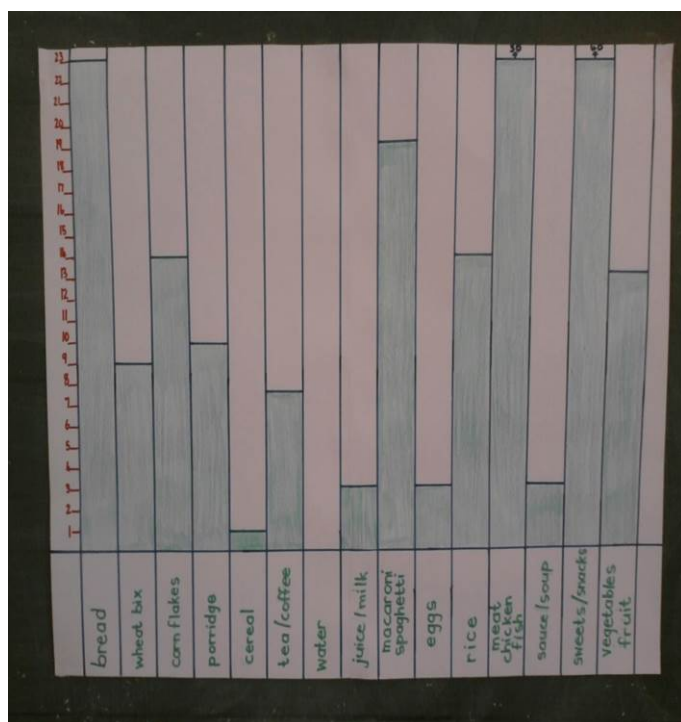
6. Finding Solutions

The teacher first did revision of the previous work done. She asked them questions about what they did in the previous lessons. She asked them *who can remember what we did yesterday*. One learner answered *food*. Then she asked them *what about food?* Another learner answered *fruit and vegetables* (LOT1.4, p. 1). She then said *yeah, but what about the fruit, the different food types that we get*. One learner answered *healthy food*. Then she said *healthy food and*. One learner said *unhealthy food*. The teacher then said *healthy food, okay. What else did we do? What did we look at of all the different food types? What did I ask you to do?* One learner answered *colour the food that we like* (LOT1.4, p. 2). The teacher said *the foods that you like you had to colour it first. That was the first day and then the second day, and then what did we do then? Who can remember?* One learner shouted *the food us to get to the plants*. The teacher said *the food that we get from the plants. Okay but what did we do yesterday. We looked also at what? Where we get food from? Its plants and what else?* One learner answered *and the*

chicken. Another learner answered *animals* (LOT1.4, p. 3). The teacher then asked *but what did we do yesterday on the board?* One learner said *teacher did ask us what food we like*. The teacher said *what food we like, yes, and what else?* One learner answered *how many times we ask to, to eat?* Another learner said *how many times we eat it*. After the revising the work with the learners the teacher asked them to say the rhyme with her again (LOT1.4, p. 4).

The teacher then went on and said *okay now what I also told you yesterday. We collect, we calculated how many of us are eating the different foods and I went to put it up on a graph. So you can just turn like this so you can face the board* (LOT1.4, p. 8). *So I put up all the different foods that we named in the, what we having for breakfast, lunch and for supper* (LOT1.4, p. 9). She then named all the food types that are on the graph that they had on the board the previous day. She also explained how she grouped the different food types; *so the different food, foods that we eat is bread, wheat bix, corn flakes, porridge, cereal, that we drink; tea and coffee, water, juice and milk. I have put together macaroni and spaghetti. I have put together eggs, rice, meat, chicken and fish. I have put together sauce and soup. I have put together and snacks I have put together and vegetables and fruit I have put together.*

Then I have made some numbers there to indicate how many of us are having this food (LOT1.4, p. 9).



The teacher and the learners looked at the graph to see how much the different food types are consumed by them. Some of the foods are consumed *much* more than the others. They

discussed this as they were looking at the graph (LOT1.4, pp. 9-12). Then the teacher put up another poster.



She said to the learners *okay now let's see why we need to eat different types of food and what food are good for our bodies and what food are not* (LOT1.4, p. 12). Learners looked at the poster and shouted wow. The teacher then said *yeah, so here are the different foods. Why do we need healthy food? Who can tell me? One learner answered to grow. The teacher said to grow, yes, you need healthy food to grow from a baby to a big child like you are now. Why do we also need to eat healthy food? One learner answered to stay alive* (LOT1.4, p. 13). The teacher said *yes, to stay alive but what else? One learner answered to be healthy. The teacher said to be healthy yes, what else? One learner answered to be strong. The teacher said to be strong, why do we need to be strong? To help our bodies fight what? One learner answered bad guys. The teacher said no. To help our bodies fight what* (LOT1.4, p. 14)? One learner answered *it is helping our bodies*. Then the teacher asked *for what, for not getting what, for not getting sick*. Learners replied *sick*. Then the teacher said *so we need to eat this protection food, which is what? The learners answered fruit and vegetables* (LOT1.4, pp. 15-16). (FS)

The teacher went on by saying *fruit and vegetables and we saw that only fourteen of us are having that so it means that halve of the class are not eating protection food that is why we always having running noses and coughing and wearing what? Glasses, (FS) okay, and then we also have the bread and the porridge that all of us are eating very nicely and that is to give*

us energy and it seems to me you are having too much of the energy foods that is why you can't sit still in class and not enough of this. The teacher pointed to the picture of fruit and vegetables. The teacher then said to them so now I want to teach you a rhyme again but before I tell you about the rhyme. Do you remember about the nurses that were here? The learners replied yes. She went on saying now the nurses came and examined our whole bodies, the ears, the eyes, the noses, the throats and necks and everything. What they have found in grade 1 is many of you are having weak eye sight, you can't see properly (LOT1.4, p. 16). One learner shouted I can see. The teacher went on and we know there are still many that need to be tested but now already it is Tony, it is Simaneka, it is Immanuel, and it is Gideon. I know that David must still go. Velemina must also go. Another learner shouted and Miina. The teacher said so there are many and that is because of what? One learner answered cause of sickness.

The teacher said no, because of what, because you are not doing what. One learner said because of sitting in front of the tv (LOT1.4, p. 17). The teacher said yes, but what are we doing now, because you are not eating what foods? The learners replied healthy foods. The teacher replied healthy foods (LOT1.4, p. 18).

The teacher went on saying okay so we need to eat healthy food for our eyes not to get weak and then we also said many of us are having rotten teeth. Why are you getting rotten teeth, eating too many sweets? One learner answered yeah. She then said okay now let's see what we can do through this rhyme to help us protect our teeth and our eyes and then you must listen and tell me what do they say. What is protecting our eyes and what is protecting our teeth (LOT1.4, p. 18). The teacher started the rhyme and the learners had to repeat. The rhyme went like this. (FS)



My teeth like apples; they go crunch, crunch, crunch; My teeth like bread, they go munch, munch, munch; my eyes like carrots, they go crunch, crunch, crunch; my muscles like cheese; they go munch, munch, munch (LOT1.4, pp. 18-20). After they finished saying the rhyme the teacher asked the learners questions. The teacher asked *now what does the rhyme tell us, what must we eat for our teeth to be protected?* The learners shouted *apples and bread*. Then she asked them *and for our eyes?* The learners answered *carrots*. The teacher said *carrots, yes, so we must eat, what must we eat for our teeth?* Learners answered *apples*. The teacher asked *apples and what?* The learners answered *bread*. Then she asked them *what must we eat for our eyes*. The learners answered *carrots*. Then she asked them to say the rhyme again of ‘my teeth’ (LOT1.4, pp. 21-22). (FS)

Thereafter the teacher said to them *okay before you go back to your places she asked them what can we do, we have seen that we are using a lot of different food types, isn’t it*. The learners replied *yes*. The teacher further went on and said *to stay healthy, to grow, to have energy and to protect our bodies from falling ill. What can we do to make sure that we always have these foods, what can we do?* (FS) The learners answered *to buy*. The teacher said *no, what if the shops don’t have, what if there is no food left in the world, what can we do? Where will we get food from?* One learner said *plants*. The teacher said *we must plant what?* One learner said *vegetables*. The teacher said *vegetables and*. One learner said *carrots*. Then the teacher said *vegetables and, carrots are vegetables*. Another learner said *fruit* (LOT1.4, pp. 25-27). (FS)

The teacher said *so what can we do? What can we do here at school to always have fruit and vegetables? Are there any vegetables here at school, do you see a vegetable garden*. The learners replied *no*. Then the teacher said *there is a vegetable garden, behind the grade 2’s. So we said we can plant and we said there is a garden there at the back of the grade two’s so who knows what Mr Nyeliso planted there? Who knows what he planted there? Who saw?* (FS)

One learner said *I saw* and went on and said *seeds*. Then the teacher asked the learners *what seeds?* One learner said *carrot seeds*. Then the teacher asked *did he plant carrots there?* The learners answered *no*. The teacher then asked *what Xavier?* The learner answered *mealies*. The teacher then said *is it only mealies? I wonder*. The learners replied *yes*. Then the teacher said *only mealies that you see there?* One learner said *I see mealies*. Then teacher said *many different things?* The learners said *no, only mealies* (LOT1.4, pp. 27-29). (FS)

The teacher went on and said *okay I wanted to go and look break what he is planting there and then if there is no carrots planted and if there is no apples planted, but I am not sure about apples, but then I want you for your homework to bring us seeds of carrots and seeds of apples and then what can we do with it.* The learners answered *plant it.* Then the teacher asked *will we plant it ourselves?* Some learners said *yes* and some said *no.* Then the teacher said *who can we ask here at school to help us? Who can we ask?* One learner said *Petrus.* Then the teacher said *Petrus or what other teacher is having that garden? Mr who? I just said the name now.* *Mr Nyeliso, must we ask Mr Nyeliso to plant it for us?* The learners said *yes.* Then the teacher said *and if it is growing now and if it is ready to eat, when can we eat it?* One learner said *when the school opens.* The teacher said *yeah, but during the day, which time can we eat it?* One learner said *Sunday.* Then the teacher said *no, when you are here at school, what time of the day can we eat?* The learners answered *break time* (LOT1.4, pp. 30-32).

The teacher went on and said *what if there are no carrots in the garden? What happens then? Who can we go and ask to give us carrots? Who can we ask? Who is giving us food every day?* One learner answered *my mother.* Then the teacher said *yeah, your parents.* The learners replied *yeah.* The teacher said *our parents and are we going to bring sweets?* The learners replied *no.* The teacher asked: *now what are you going to bring? Tell me?* The learners answered *carrots, apples, bananas and bread.* Then the teacher asked them *okay what should we put on the bread?* One learner answered *butter.* The teacher then said *butter and?* The learners answered *jam, cheese and tomatoes.* Then the teacher asked *jam, is jam good for our teeth.* The learners replied *no.* Then she asked them *why it's not good for our teeth?* One learner said *because it is unhealthy.* The teacher said *because how does it taste?* One learner said *sweet.* The teacher said *sweet and sweet things make our teeth?* Learners answered *rotten.* The teacher then said *rotten* (LOT1.4, pp. 35-39).

She further went on and asked them *how can we tell the parents of what we just decided here? I said what can we do to make sure that the parents put that in for us every day, the healthy food.* One learner said *to ask.* The teacher said *to ask, how can we ask them? How are we going to remind them?* One learner said *you must say pretty please.* The teacher said *no, through what? Are we going to phone them or what am I going to do? How am I going to give them the message?* One learner said, *phone them.* Another said *no.* The teacher said *I can't phone all the parents. I don't have that money.* One learner said *go and ask.* The teacher said *I can't go and ask all the parents. I don't have the time also. What can we also do?* The learners replied *ask.*

She went on saying *one other thing here that I have seen on the graph, nobody is drinking water and water is so important for our bodies. Nobody indicated water, so you also going to tell in the letter that we going to write to the parents, no more bringing cool drink to school if it is not water, or juice or milk or real juice. You must bring water. Everybody will bring water. We are going to write them a letter and we going to send it out to the parents* (LOT1.4, pp. 50-51).

7. Action taking

The teacher started this process by first asking the learners a few questions about the solutions that was decided upon in the previous period. She started off by saying *so you remember the lesson that we did about how to help us making our eye sight better?* The learners answered *yes teacher*. She went on and said *and then we decided we're going to eat, what must we do? What did we decide what must we do?* One learner answered *to eat carrots*. (LOT1.5, p. 1) Then the teacher said *to eat carrots and then what did we decide then? What did we decide then? What will we do? What are we going to do?* One learner answered *plant*. (ACT)

Then the teacher said *plant and who is going to plant the seeds? Who did we say? Ourselves!* The learners replied *no*. Then the teacher said *who did we say? Who are we going to ask? Our parents!* The learners said *no*. Then the teacher said *now who are we going to ask a teacher or Petrus or Moses?* One learner said *no*. She then said *how did we say?* The learners replied *Petrus*. Then the teacher said *Petrus, I don't think so. So who did we say, who are we going to ask here at the school?* One learner answered *the principal*. Then the teacher replied *no, how can the principal go into the garden and plant seeds?* One learner said *it is a man*. The teacher then said *it is a man. Now this man is it someone here working at school*. Some learners said *no* and then some said *yes*. Then she asked them *what is the person doing here at school? What is he here at school?* One learner said *he plants*. Then the teacher said *he plants yes, he is working in the garden*. One learner said *Mr Kahambundu*. Then the teacher said *no not Mr Kahambundu. What is Mr Kahambundu here at school? What is he?* One learner said *a teacher*. The teacher said *a teacher. So we are going to ask a teacher and you forgot the teacher's surname*.

So he is waiting there for us at the garden. We are going to move now so he can show us how to plant the carrot seeds. We are not going to do it ourselves. He is just going to show us. So at home or at the farm we can also plant our own carrot seeds (LOT1.5, pp. 1-6).

At the garden the agriculture teacher took over the lesson. He started off by asking the learners *now this vegetable*. One learner answered *tomato*. He went on saying *it is a tomato vegetable*. *Okay and apart from the tomato vegetable, and this one?* One learner answered *carrots*. He said *no it is not carrots, okay, that is an onion*. The learners replied *onions*. He went on saying *okay so today I am going to teach you or demonstrate to you how to plant a carrot vegetable*. *Do you know a carrot all of you?* The learners replied *yes teacher*. Then he asked them *what the colour of a carrot is?* The learners replied *orange*. He then went on and said *orange yes, so a carrot you can plant either this time of the year that is winter time or in summer time, do you understand?* The learners replied *yes*, He went on explaining *because what will happen is if the soil is good the seeds they will germinate after seven days. Seven days it means after one week. If it is very cold, then it will take a bit longer to come out from the soil. That will take up to fourteen days, it is two weeks and then the seeds will germinate. Then a new young plant will start growing up but then if it is very cold the little leaves of the carrot will start falling off because it is very cold. Do you understand?* The learners replied *yes* (LOT1.5, pp. 6-9).

He went on saying *that is why you see like now I didn't start planting anything because you remember this last two weeks it was very cold. Otherwise our seeds it will die. So today we are going to plant the carrot seeds so let me show you the ones that never saw how a carrot looks like*.



Can you see? The learners replied *yes*. He went on saying *so inside this plastic is the seeds. So for a carrot to grow it must be measured in centimetres, in which units?* The learners replied *centimetres*. He said *centimetres that are one or two centimetres. So one or two centimetres is from the edge, from the tip of your finger, all of you do like this*. The learners were sticking up

their fingers. He went on saying *yes; you see where your finger is ending*. The learners replied *yes*. He then said *yeah, at the end there, and then you see the first line. From the tip of your finger that is what you call two centimetres. Then what you do, and then you place your finger in the soil up to that line. Can you see?* The learners said *yes*. Then he said *then from there you take one or two seeds of the carrot then you put it in that hole to cover it. Then from here to here there should be a distance of almost thirty centimetres. The size of a ruler, you know the size of a ruler*. The learners replied *yes* (LOT1.5, pp. 9-11).

He went asking *anyone who can come and put a finger in a hole and make a hole in the soil. Yes come*. The learner pointed his finger in the soil. He said *yes there*. The learner struggled to make the hole; he replied *it is too hard*. Then the teacher said *it is too hard. Yes, because the soil is not wet. We are going to water it*. The demonstrated how to make the hole with his finger. He went on saying *there you go. It must not be that deep. If it is deep the soli; I mean the seeds cannot come out, cannot germinate. Do you understand? That is why it should be two centimetres from the tip up to the first line. Then you take one or two seeds then you put, then you cover again. So it must be a straight line from here it must be a straight line. Just because I didn't come with a rope, you use a rope, you know a rope?* The learners replied *yes*. He went on saying *you use a rope. One must be held here then you go up to there. So it must be straight. Then we must sow the seeds in a straight line up to there*. (LOT1.5, pp. 11-13) He continued saying *so what we will do on Monday after break. You will come back to the garden. I will give you the digging fork. The one that you hold with your hands and you loosen up the soil, do you understand, so that the soil must be soft, do you understand?* The learners replied *yes*. The teacher went on saying *then you will see your seeds to start coming up from the soil. That is what we call germination, is it clear*. The learners replied *yes* (LOT1.5, pp. 15-16). (ACT)

The next day the teacher took the learners out into the garden again to demonstrate to them how to sow the carrot seeds.





He started off saying you remember you were here Friday and I demonstrated to you how you can sow the or how you can plant the carrot vegetable. So today we will start planting the seeds so that we can see how it is done. Then after 7 days or one week then those seeds that you will be planting today they will start coming out. When they come out from the soil it is when you call germination. Do you understand? It is called what? The learners replied germination (LOT1.6, p. 1).

He further went on saying yes they germinate. Now when you are planting the seeds of any vegetable plant you must plant them in a row. In a straight line, you understand. So I promised to come with a what, a rope. There it is and I promised to come with the seeds. It is here can you see. And I came with a ruler; you remember I talked about measuring the distance from one hole to another hole apart from each other so you use a ruler. So it must be centimetres apart from each other. Okay now I will start without wasting time (LOT1.6, p. 1). All the learners were paying attention and listened to the teacher very well. He went on saying so here we are going to use the rake as our line. The teacher made a line in the ground with the rake which was laid down. He continued saying you see what I am doing. The learners replied yes. He continued with the demonstration saying sorry, sorry, sorry, then you turn it so that you can

create another line this side in this area. Okay now I will ask these two boys there to make a deep line with the pick you see that tool that is there. The learners replied yes. He continued saying it is called a pick. Now I have already made a line where they can see. Where they can make a deeper line; so one of them will be holding the pick then the other one will be pulling. Do you understand, okay, start from there. Make a deeper line up to here. Follow the line itself. Yes, start from there. From the beginning, okay, hold for him. Make a straight line, follow the line, okay, and now give me the ruler. Okay check carefully what I am doing here. You can see a ruler is starting from zero up to 30 centimetres and that is the distance that you can use from one hole where you going to place the seeds of the carrots, to another hole. We will start here at the beginning. So it will be like this. You remember I told you that it should be two centimetres. The first line of your finger, you put it here than you know the line is starting from here. Can you see? The learners replied yes.

He went on saying put the hole here. From here up to here it is thirty centimetres. Then you start again from the second hole, you see. Okay, now bring the packet of the seeds. Okay thanks, so you see I didn't take out the ruler because otherwise if I take it out I won't see where I put the holes. Then I will be confused. Then you open nicely, and then you take some seeds. You see they are too tiny small seeds. So don't put all of them. You can take few, even two or three. Then you put in the first hole. Check, then you what? The replied close. He went on saying then you cover, yes. Cover the hole, the first hole. This is the second one. You see where the ruler is starting? The learners replied yes. Then the teacher said then you put few seeds, then you cover it, then you close it. Then I know the third hole is here, then you take, you put in the hole, then you cover it. Then you know where you are going to start again. So the ruler is here. Then place it again from the last hole, so that you can create another hole, somewhere here. Can you see, than you put some seeds, is it difficult for you? Some learners said yes and some said no. The teacher said it is easy. One learner replied yeah (LOT1.6, pp. 1-4).

The teacher went on saying is it okay; it's this one for you. Okay now I want one learner, a girl or a boy, to come and make a hole for us there where the ruler is ending. So that you must sow the seeds, yes. One learner went to demonstrate and he could get it right. (ACT)



This made the rest of the learners all eager to also demonstrate how to sow the seeds. While the learner was demonstrating he was assisting them saying *yes, you, yes demonstrate. Check now to your friend. Okay there you are then I will give you the seeds. One learner said now put in.* The agriculture teacher went on saying *open the, okay; there you are, put, look where you make the hole. They must not fall out, okay, okay it is enough. Then close the hole, close it, close it. Okay!* One learner said *it is so easy.* The teacher went on saying *then I want someone who will come and measure from there and create another hole there. One from that side, yes you come* (LOT1.6, pp. 4-5). The learner demonstrated how to sow the seeds and the teacher once again assisted him. He did this until all the holes that were made and got seeds in it (LOT1.6, pp.6-8). Then he went on asking them *will you plant seeds with your family* (LOT1.6, p. 8). The learners replied *yes.* The teacher then said *okay then I am glad.* One learner called the teacher telling

him teacher, teacher, me and my grandmother we plant carrots. Then the teacher said carrots, the same one that we were planting today, that is nice, you see, he is already having an experience on how to plant vegetables, that is good. We learn from each other. You must have your own experience at home yeah. When you come here you have got an idea, how you can do it (LOT1.6, pp. 8-9). (ACT)

8. Reflection on whole lesson

The teacher started this part of the lesson by asking the learners key questions on all the work that has been done for this topic. She started off by asking *do you remember this rhyme*. The learners said yes. Then she asked *who can read the word at the top*. One learner answered *food*. Then the teacher said *the rhyme is about food. Can we say the rhyme all of us together*. The learners said the rhyme: *First the seed and then the grain; thank you, thank you for sun and rain. First the flour and then the bread; thank you, thank you that we are fed; thank you, thank you for all the care; help us all to share and share*. The teacher continued saying *so this rhyme is all about*. The learners replied *food*. The teacher asked *what food they mention in the rhyme*. One learner answered *bread* (LOT1.7, pp. 1-3). The teacher then asked them *what they tell you about the bread*. One learner answered *the bread is healthy*. Another learner said *flour*. Then the teacher asked *now where do we get the flour from?* One learner said *flour from the tree*. The teacher asked again *where we get the flour from*. One learner said *from the trees*. Another learner said *from the ground*. The teacher said *from the ground. Just like that from the ground. What must we first do before it becomes a grain?* One learner said *you have to water*. One learner answered *bread*. Then the teacher asked *how can you put the bread in and then bread will come out again. Is it how we do it*. The learners replied *no*. Then the teacher asked *now what must you put in the ground?* The learners replied *seeds*. The teacher said *seeds. They say first the seed and then the grain. So first the seed and then the grain comes out from the grain they make*. One learner answered *flour*. The teacher said *flour. From the flour they make*. One learner said *bread* (LOT1.7, pp. 5-8).

The teacher went on telling the learners *here is another one. Who can read this one?* Almost all the learners read *healthy food*. Then the teacher said *okay all of us*. The learners read *healthy food*. Then she asked them *let's read*. The learners read: *Food, food, healthy food. Fruit so sweet good to eat; Food, food healthy food, milk and bread and cheese; we know what is good for us, no junk food to mess us up; Food, food healthy food, fresh food from the farm*. The

teacher said *in this rhyme what do they say. What is the rhyme all about?* One learner answered *healthy food*. The teacher asked *what food they mention in the rhyme*.

The learners answered *bread, cheese, milk*. The teacher said *okay and those are all what type of foods. What did they say in the rhyme?* One learner answered *healthy food*. She said *let's look at the last rhyme*. The learners read: *My teeth, my teeth like apples, they go crunch, munch, crunch. My teeth like bread, they go munch, munch, munch. My eyes like carrots, they go crunch, crunch, crunch. My muscles like cheese. The teacher said they go*. The learners replied *munch, munch, munch*. The teacher asked *what do they say, what is this rhyme all about?* One learner said *my teeth like apples*. The teacher said *my teeth. The rhyme is about my teeth and what other body parts is the rhyme also about*. One learner said *apples*. The teacher said *no, what other body parts are the rhyme also about. You said teeth and what else*. One learner said *eye*. The teacher then asked *now what do we need to eat Kyle for our teeth to be good and healthy*. The learner said *bread*. The teacher said *bread and what else*. Another learner said *apples*. The teacher said *bread and apples and for the eyes*. The learners replied *carrots*. The teacher said *for the eyes carrots and for the muscles*. The learners replied *cheese*. The teacher said *cheese and for the muscles cheese* (LOT1.7, pp. 8-14).

She went on saying *listen now last time when we did the lesson. We decided what type of food we must eat in order for our bodies to be healthy*. The learners replied *healthy foods*. The teacher continued asking *what did we decided what are we going to do in order to make sure that we are eating healthy foods? What did we say? What must we do?* One learner said *to promise*. The teacher said *to promise but how will teacher know that you are eating healthy foods. Where will I see that you are eating healthy foods, during what time of the day?* One learner answered *break time*. The teacher said *so we promised that we are going to bring what types of food to school*. One learner said *healthy food*. The teacher said *healthy food. Who is going to check that you are bringing healthy food? Demarscho!* The learner answered *teacher*. The teacher said *teacher and at home, who is going to check that you eat your healthy food*. The learners answered *mommy*. The teacher said *mother and how are you going to tell the parents that you must eat healthy foods. What did we say are we going to give them?* One learner said *a letter*. The teacher said *we are going to give a letter to the parents and we are going to show the parents what you must eat in order for you to stay healthy. Okay and then we said we are eating so many foods every day. Isn't it?* The learners said *yes teacher* (LOT1.7, pp. 14-18).

Then the teacher said *and where do we get all these food from?* The learners replied *farms*. The teacher said *farms but where from the farms*. One learner said *from the seeds*. The teacher said *from the seeds but if you plant the seeds what is coming out. Where are we getting it from?* *The trees and the*. The learners said *plants*. The teacher said *plants and what are also giving us food? What else?* One learner said *animals*. The teacher said *the animals*. *We said the plants and the animals are giving us food. What will happen if those die out? There are no plants, there are no animals. What will happen?* One learner said *we will die*. The teacher asked *what we will not have*. Another learner answered *we will not have food*. Then the teacher asked *so what must we do in order to make sure that we always have food*. One learner answered *we must plant*. The teacher said *plant and did we plant*. The learners replied *yes*. The teacher asked *and what did we decided to plant*. The learners answered *carrots*. The teacher said *carrots and did you go and have a look during break like I said. You must go look if it came out, if it started to grow?* The learners replied *yes*. The teacher asked *did it germinated already*. The learners said *yes*. The teacher asked *did it germinated already*. The learners said *yes*. The teacher said *so we just have to wait until it's grown big. So we can eat nice, nice carrots and tastes how tasty it is* (LOT1.7, pp. 18-21).

The teacher went on saying *there was an activity in the book that I said you must colour and we didn't write in the names of those pictures because that time we didn't know how to write them yet but now we know. So what you going to do is, you going to go back to your places. I will hand out the books and then we are going to write each name on the board and you must choose the correct one and you must write it on the line. You must do it very quick. Then there is another activity I am going to give you and another one. There are three. Okay the word bread. Find the word bread and write it next to the correct picture* (LOT1.7, p. 21). This was done with all the pictures on the worksheets until all the names of the pictures were written in (LOT1.7, pp. 21-32). The teacher continued saying *so the next activity that you are going to do tomorrow, it is just an activity that you just need to do, another activity that we going to do, a worksheet, that we didn't get time for today, we are going to do it quickly tomorrow* (LOT1.7, p. 32).

The next day the teacher started off by asking the learners some questions about the topic just to refresh the learners' minds again. She started off by asking; *who can remember what we need to live. Demarscho*. The learner answered *a house*. The teacher said *to stay alive, what do we need?* One learner answered *food*. The teacher said *we need food and we said what type of food should we eat?* One learner answered *unhealthy food*. The teacher said *should we eat unhealthy*

food. The rest of the learners replied *no*. The teacher then asked; *what type of food should we eat*. One learner said *healthy food*. The teacher said *we should eat healthy food and who can still remember what should we eat for our eyes and our, what should we eat for our eyes, for the eyes to be healthy*. One learner said *carrots*. The teacher said *carrots and for the teeth*. *We don't shout*. *What should we eat for the teeth?* *Miina!* The learner answered *apple*. The teacher said *apple*. The teacher said *apples and what else?* *Immanuel!* The learner answered *meat*. The teacher said *no, think about the rhyme that we did*. *Apples and*. One learner said *bread*. The teacher said *apples and bread and for the muscles*. *Mampi!* The learner answered *cheese*. The teacher said *cheese* (LOT1.7, pp. 32-35).

The teacher went on saying *and then we said we eat a lot of food every day. We saw it on the graph. Isn't it!* The learners said *yes*. The teacher then said *so what will happen if there is no food in the world anymore*. (REF) *Vezemba!* The learner said *we will die*. (REF) The teacher said *he said you will die. Now what can we do in order to make sure that we always have food*. (REF) *Jason!* The learner said *pray*. The teacher said *pray and then the food will just come*. *What can we do except for praying?* *Punaete!* The learner said *plant*. The teacher said *he is saying we can plant and did we plant*. The learners said *yes*. The teacher asked; *what did we plant?* The learners said *carrots*. The teacher said *so we decided we are going to plant carrots and did the carrots came out*. The learners replied *yes*. The teacher asked *did they grow*. The learners replied *yes*. (REF) She then asked *is it bigger now*. The learners said *no*. The teacher asked again *is it bigger*. One learner said *no, it is still a little bit small*. Another learner said *it is still small*. One other learner said *it is just the leaves that are coming out*. The teacher said *so we can plant to make sure that we have food all the time. So we as people can do something about it* (LOT1.7, pp. 35-38). (REF)

The teacher continued asking *now how did you feel the day that you have planted the seeds?* The learners replied *nice*. The teacher said *is it. Did you feel good about it?* The learners said *yes*. The teacher asked them *will you do it again*. The learners said *yes* (LOT1.7, pp. 38-39).

The teacher went on asking *now what do you think what could we have done differently. Is there anything you would have changed?* The learners replied *no*. The teacher asked them *why not?* One learner said *cause*. The teacher said *Sarti!* The learner didn't reply. The teacher went on saying *okay, let me ask you so. Did anything go wrong at the planting?* The learners replied *no*. The teacher said *no, everything went, everything went*. The learners replied *right*. The teacher said *everything went well* (LOT1.7, pp. 39-40). (REF)

She continued saying today I want to see if you can still remember all the things that we have learnt. So I have two papers with questions on it and you must complete it. We are going to do it together. I'll give you the paper. You write your name on it and then I will take it back again. Okay so the worksheet is about the topic nutrition, healthy and unhealthy food. Now at number one, we need to maintain a healthy or unhealthy diet. You must choose between healthy and unhealthy food. If you choose healthy make a circle around it. If you choose unhealthy than you make a circle around it. You must choose only one of them, healthy or unhealthy (LOT1.7, p. 40). (ASS)

The teacher did all the questions with the learners in this way until the end of the worksheet (LOT1.7, p. 41).

9. Assessment – Worksheets

The outcomes of the worksheets done were measured according to results the learners obtained. Only 37 of the class group took part in this process. The other 3 learners were absent the day that the learners completed the worksheet.

Worksheet: Nutrition – Healthy and unhealthy food

1. We need to maintain a healthy/ unhealthy diet. 6/6
2. Milk and cheese build a strong body/ weak body.
3. Porridge and cereal give you energy/ makes you sleepy.
4. Fruit and vegetables keep you healthy/ sick.
5. Apples make your teeth rotten/strong and white.
6. Carrots give you weak eye sight/ good eye sight.

The outcome of the results of worksheet 1 can be found in Appendix E:

2. Complete the following sentences by choosing the correct word.

germinate
germination dig water finger seeds

2.1 To plant a seed you first have to dig a hole.

2.2 The hole must be as deep as the length of your finger.

2.3 Put in two to three seeds to make sure that it will germinate.

2.4 It usually takes 1-2 weeks for a seed to germinate.

2.5 Seeds need to get enough water in order to grow.

3. What do we need to do in order to always have food?

We must plant a seed.

The outcome of the results of worksheet 2 can be found in Appendix E.

Appendix H: Analytical memo 2

ANALYTICAL MEMO 2

CATEGORY 1: Reflections on lessons

This analytical memo was done to get the information of how the teachers' have experienced the active learning framework as a guide to plan and present lessons. This information also speaks to second goal of the research question.

Sub-Categories	Comment	Source
Views on active learning presentations	I think the lesson went well somehow. Looking at the learners. How they came back with the feedback and they try to report what they have tried what they have found at home about the way how to save water. With very good explanations of very good ways or reasons but first the presentation, I don't know. For me the lesson presentation itself, I don't know, it was not working for me. I just didn't feel it. It was like something that I was presenting not something there is something you know that you find lessons that you really feel. You present from out of your heart. You really feel like it is flowing in your system. That one was not flowing. Maybe the way that I have planned the lesson. I don't know but at the end I think the learners learnt something from it. They understood and they really came up with suggestions on how to save water. The time was also very limited. The good thing that I have also experienced with my learners just for the grade 2's to come with the solution and say that we have to put notice. I didn't expect that from them. I thought maybe they will go around the bush and give other answers but they really come to a point that they have realised that we have to put notice at every tap.	FG2T1 (p. 2-4)
	I would say from my side, from the teacher's point of view, it was a good lesson of involving active learning in. Learners could really go seek for information and they could come and report back. I could see that they are really learning to take action because we, they were active in this learning. They took it as something of their own. They were actively involved to know more about the lesson. It was like they were personally assigned to get this information as a daily life experience, as a necessity of life. Something, because of putting them to be active, the way they understood it, was like it is not	FG2T2 (p. 4-5)

	an assignment. It is just not a school work but it is an issue in life that I need to look at and what do I see and what can I do about it. That was my point of view, there was too much active in it that it created a bit of chaos because everyone experience what they went to seek for and they really wanted to give that feedback. The report back. Like I said earlier in the first interview that time consuming in this environmental learning is a bit limited. It is a reality for them. It's a reality not just something that they are studying and forget about it.	
	I would say it is a good idea or a good approach, cause it allows learners to be more active in class rather than being passive. And when you are active you learn more than when your are passive.	I2T3 (p. 1)
	From my point of view the learners really enjoyed it. They were very much excited. Everybody wanted to give back or reported what they have to seek. That also caused discipline problems and very much frustration and they couldn't understand but why can't I also give mine because in my lesson I have asked them to report back individually and because of the time everybody couldn't get a chance and I actually had to add one more period to my topic's presentation and what I did then I kind of developed a table. Where I now put down the words because they had to go and find out with the parents help, what they having for breakfast every day, lunch, sapper, snack times what they are eating. And that seemed that everybody was now satisfied. And what I did was that I actually told them that we're going to present, those that didn't present, I will give them a chance to present theirs orally in English and then I use it as an oral mark. The other thing that was, apart from the time and the, like everybody was now like eager to cooperate. I think it can work, if you can just get use to the idea. Get through more and more topics. It will probably happen through practice. That is now from my side, my personal feeling. I think it can work, getting more acquainted with it, practicing it more and the learners are really enjoying it. So I think from my point of view it can work.	FG2AP (p. 5-6)
Difficulties encountered during lesson planning	For me it was just, it was difficult for me to, I wanted to put a poster on how to safe water. I got pictures so that we can discuss. First I wanted them, I didn't know what to do now, must I just let them go and find out on how to save water for them or must I discuss with them and then let them go and	FG2T1 (p. 6)

	find out. So for me it was a little bit, I didn't know how to put my things in order, whether I must put the poster and discuss or leave the poster and let them go and do the research for themselves. That is now why I just decided I will just put a few things and then maybe I will just ask them to go get more but different from mine. It's not like now the way you teach your class normally. Now you have to go according to the steps and now you are unsure did I put the step or is the step in my lesson or not.	
	It was a little bit of not usual because I had to consider the whole setup of the framework which normally when we prepare it is more or less the same thing but here I have to consider of including all the four active learning so to say. Whereby I have to realise which one will be an issue and which action will I be expecting from the kids. All those things, it was not much a new thing though there are only a few things that I have to look at or consider in my lessons just like I have mentioned. It also required critical thinking, for me to reason. If I am going to present a lesson like this will they, be able to take action form that.	FG2T2 (p. 18)
	The most difficult part was finding an activity or creating an activity for my learners because sometimes learners know things which they are not suppose to and then you think learners know things which they don't know. So sometimes there is a lot of planning when it comes to the activity to give your learners.	I2T3 (p. 1)
	The difficulties that I have encountered when I planned my lesson, I had many difficulties. On what activities to use to mediate the lesson to help the learners to get to the point where I will now raise the issue to them but in the end I think I managed.	FG2AP (p. 8)
Including all areas of the active learning framework in lesson presentations	Mine I think I have covered so far because they went to seek the information for themselves and they reported back their ideas of what they have found out and then they even, although we didn't take the action physically they came up with an action that we were suppose to take, which is now putting up notices and reminding the people to save water or reminding the people to close the taps or something like that. Although we didn't do it physically yet so they came up with an action and enquiries they also went to find out, to enquire about on how to save water. They were all present. You know they just came without me even noticing. You know I didn't focus on the five steps, those five	FG2T1 (p. 9-10)

	steps they just came by itself when I planned my lessons.	
	I wouldn't say yes because I need somebody to tell me that. The interviewer replied: from the way that I see it, if you look at now sharing information was there a part in the lesson where they shared information? The interviewee replied: yes. The interviewer said: then enquiry of course they did because they gave them the homework to go out into the road to see what is happening there according to what you taught them, what is wrong and right and then they came back. They reported back and they also took action because they said they going to send a letter to the traffic department asking them to come and regulate the traffic here in the mornings and the afternoons to see that everything is going smooth here in front of school, the parking, so I think it is all of them. You have covered it. The interviewee replied: yeah.	FG2T2 (p. 18-19) FG2AP (p. 18-19)
	Yes, I have covered all the areas.	I2T3 (p. 2)
	From my side I also think I have covered all the areas.	FG2AP (p. 11)
Ways to overcome difficulties or problems encountered	Practice makes perfect.	FG2T1 (p. 12)
	I think, is to have a bigger or a larger time frame for the information seeking part so that you know exactly what your learners know in order for you to plan your activity	I2T3 (p. 2)
	I must just get use to the idea of active learning. I think I must just get use to the idea that when I prepare I must include all these setups.	FG2T2 (p. 19)
	Just through practice.	FG2AP (p. 12)
Competent in active learning	I also think I just need more practice to be competent. I need to practice more but I think this is a very good method. I will use it for my lesson presentations. I think for me, the problem that I had it was the way we normally present Environmental Studies and now we have to do it like properly. You know it was also playing a little part of me there because the way we do it is; we do it because of the time. We just explain to the learners, just to explain the topic and just to discuss the topic a little bit and then it is over now. You have to do it according to the steps and you have to do it officially and professionally and everything. It is the way that we	FG2T1 (p. 13, 15)

	should do it but because of the time and everything we don't do it that way.	
	I do, I do feel competent because in doing so it will be more learner-centred education, which means I won't be doing much talking. The whole class, the learners and I will be involved in the lesson because it gives us the opportunity to explore, to enquire what we are looking for. Yes I think I will be competent to present this kind of a lesson.	FG2T2 (p. 20)
	Yes I think, I feel competent because it is rather easy working with what you get from the learners instead of starting from the start and doing things that the learners already know. So I think I am competent enough. And even since the first time, I just continued using this approach. It is working	I2T3 (p. 3-4)
	I think I feel competent but as we said now with the previous question, practice. I feel competent. I think I have it now under my knee. It is now just practice and also to be able to judge how much time am I going to use on the different activities. So sometimes you think it will take like five minutes then it ends up taking like in twenty five minutes. That is also something that I need to work on so that I don't like in waste time of the learners and I think also, what I can also do is to keep them engaged in the lesson because sometimes when, like when the one was presenting the others were not like in interested. Maybe it was because it was there first time and they weren't use to this kind of way of teaching and they will also now with practice get use to it. Now you need to listen, now you can quickly discuss with your friend. They were very excited because they sitting here with their papers. They were just trying to look at each others, telling each other, no I wrote this here instead of listening to the person that was presenting. So I think maybe with time, I think definitely they will also get use to this and that they will also get a turn and that everybody will eventually hear what the other one wrote or broad back of what they have enquired.	FG2AP (p. 13)

Appendix I: Analytical memo 3

ANALYTICAL MEMO 3

This analytical memo was done to determine the relationship between the active learning framework and educational quality. The quality indicators of Nikel& Lowe (2010) were used in this process.

Theme 1: Effectiveness

SUB-THEME	COMMENT	SOURCE
What were the objectives of the lesson?	Understand better how livelihoods are dependent on the environment. Collect, classify, analyse and interpret data. Organise, plan, implement and monitor an environmental project. Encourage a sense of personal and social responsibility and a desire to work co-operatively with others on an environmental issue. By the end of grade 2, the learners can explain how and why water can be saved and stored. By the end of the lesson learners should be able to know why water must be used sparingly what happen if it is not, where water can be stored in the environment. Learners will be able to understand that traffic safety depends on correct behaviour and following safety codes on the road. No lesson plan was received for this grade's lessons of the topic. Although there were no objectives I looked at the topic and how the lessons played off to see what the teacher wanted to teach them. The focus area of this particular lesson was about waste management. The teacher wanted to teach the learners that waste can be managed in different ways. The main focus of this topic was to teach to learners how to reuse organic substances in order to manage waste and to do something for the environment.	MCS1 (pp. 1-2) MCS2 (p. 1) MCS3 (p. 1) MCS4 (p. 1)
How was the objectives met?	Asking the learners questions about the topic to stimulate their background knowledge. She used pictures to mediate this part of the topic.	MCS1 (pp. 2-6)

	Using rhymes to mediate the content knowledge of the lesson.	MCS1 (p. 4, 6, 10)
	Giving the learners written activities to determine their understanding of the topic.	MCS1 (pp. 5, 13)
	Asking the learners to do an inquiry.	
	They reported back on what they have found.	MCS1 (p. 5)
	The learners had to come up with solutions to address the issue.	MCS1 (p. 6-8)
	Taking action by planting carrot seeds.	MCS1 (pp. 8-14)
	The teacher also asked the learners to reflect back on the lesson.	MCS1 (pp. 14-18)
	Assessing their knowledge of the content taught by giving them a worksheet to complete.	MCS1 (p. 22)
	The teacher used story to start the lesson and asked questions about it.	MCS1 (p. 23-24)
	Asking more questions to determine what they know already and what not	
	Pictures were used to mediate the content of the lesson.	MCS2 (p. 2-3)
	Asking learners to do an inquiry about how water can be saved.	
	They reported back on what they have found.	MCS2 (p. 3-5)
	The learners had to come up with solutions on how to address the issue.	MCS2 (p. 5-8)
	Taking action by making and putting up signs on using water sparingly.	MCS2 (p. 7-8)
	The teacher also asked the learners to reflect back on the lesson.	
	Assessing their knowledge of the content taught by giving them a worksheet to complete.	MCS2 (p. 8-14)

	The teacher did a rhyme with the learners and asked questions about it to stimulate their background knowledge.	MCS2 (p. 14-15)
	Traffic sign pictures were used and questions were asked to mediate the content of the lesson.	MCS2 (p. 15-16)
	The learners had to do a role play on how to use the road correctly.	MCS2 (p. 17)
	The learners did an inquiry in their community on how the road is being used by car drivers and pedestrians.	MCS2 (p. 18-19)
	They reported back on what they have observed.	MCS3 (p. 1-2)
	The learners had to come up with solutions on how to address the issue.	MCS3 (p. 2-5, 7-8)
	Taking action by writing a letter to the traffic department.	MCS3 (p. 5-6)
	The teacher also asked the learners to reflect back on the lesson.	MCS3 (p. 6)
	Assessing their knowledge of the content taught by giving them a worksheet to complete.	MCS3 (p. 8-10)
	Reading a short piece from the textbook and looking at pictures of waste in the textbook and asking questions about it.	MCS3 (p. 10-11)
	Giving the learners questions to discuss in their groups and give feedback afterwards.	MCS3 (p. 11-13)
	Asking general questions about the topic.	MCS3 (p. 16-18)
	Asking the learners to do an inquiry about the main points of the lesson. This was done by giving them questions which they had to find the answers for at home.	MCS3 (p. 18-19)
	The learners had to report back on the inquiry what they did.	MCS4 (p. 1-3)
		MCS4 (p. 3)

	The learners had to come up with solutions to address the issue. Taking action by teaching the learners how to make a compost heap. A reflection on the whole topic was also done.	MCS4 (p. 3-4) MCS4 (p. 4) MCS4 (p. 4-8) MCS4 (p.8-11) MCS4 (p. 11-13) MCS4 (p. 13-15)
Did the objectives add value to the individuals existing knowledge?	Yes, because they now know what food types are healthy for their bodies and what food types are not and that we should plant seeds in order to always have food. Yes, because they now know the different ways on saving water and how to use water sparingly. Yes, they now know how to use the road the correct way and why it should be used correctly. Yes, because they now know the dangers of waste and how waste can be managed by reusing, recycling and reducing it.	MCS1 (pp. 9-14) MCS2 (p. 5-15) MCS3 (p.2-10) MCS4 (p. 2-13)

Theme 2: Efficiency

SUB-THEME	COMMENT	SOURCE
What resources were used during the lesson presentations?	Pictures of different food types. Rhymes A questionnaire to collect information in their living environment. A graph displaying all the different food types on it was used. Different tools were used on how to plant carrot seeds. The teacher used a story to stimulate the learners' background knowledge. Pictures were used to mediate the content knowledge of the lesson. Posters with pictures on how to save water. Pictures were used to mediate the content of the lesson. A handmade road for learners to role play how to use the road The learners had to complete a worksheet about the content of the lesson to see how much knowledge they obtained of the content that was done with them. A written piece and pictures in the textbook. Worksheets were done by the learner right through the presentation of the topic. Waste materials and tools to make a hole in the ground.	MCS1 (p. 3) MCS1 (p. 4, 6, 10) MCS1 (p. 5) MCS1 (p. 9) MCS1 (pp. 15-18) MCS2 (p. 2) MCS2 (p. 5) MCS2 (p. 15) MCS3 (p. 2-6) MCS3 (p. 5) MCS3 (p. 18) MCS4 (p. 2-4) MCS4 (p. 4) MCS4 (p. 12-13)
How was the	The teacher asked the learners questions	MCS1

resources used?	about the pictures of the different food types on the poster. The teacher and learners discussed the content of the graph which displayed how much food they are consuming daily. Teaching the learners the rhymes and asking them questions about the content of the rhyme. Demonstrating with the tools how to plant carrot seeds. The teacher asked the learners questions about the story and discussed the importance of water. Different pictures on how to save water was discussed. Posters (signs) were made on how to save water. The teacher asked the learners questions about the rhyme. Questions were asked about the pictures of traffic lights to see what learners know and what they don't know yet. The teacher used the handmade road for learners to demonstrate how to use the road the correct way. The teacher asked the learners questions about the written piece and pictures in the textbook. The learners had to complete questions which they had to inquire at home.	(p. 3-5) MCS1 (p. 9) MCS1 (p. 4, 6, 10) MCS1 (pp. 15-18) MCS2 (p. 2-3) MCS2 (p. 5-8) MCS2 (p. 15) MCS3 (p. 1-2) MCS3 (p. 2-5) MCS3 (p. 5-6) MCS4 (p. 2-4) MCS4 (p. 4-8) MCS4 (p. 11-13)
-----------------	--	--

	The waste materials and tools were used to demonstrate how a compost heap is made.	
Were the resources appropriate for the topic of the lesson?	Yes, because all the resources that was used was in relation with the objectives of the lesson.	MCS1 (pp. 3, 4, 5, 6, 9, 10, 15-18) MCS2 (p. 2, 5, 15) MCS3 (p. 2, 3, 4, 5, 6) MCS4 (p. 2-4, 4-8, 11-13)
Did the resources used allow for learners' active participation?	Yes, because the learners were very enthusiastic to participate. They were so eager that it almost became chaotic in the classroom because all of them wanted to participate at the same time. Almost becoming angry if they already had a chance and couldn't get a second chance. Didn't want to give each other a chance to participate. Yes, the learners were very eager to answer the questions and discuss the pictures on how to save water. They enjoyed making the signs on how to save water. A very neat job was also done by them. Yes, because they could answer the questions and they could draw and explain how a compost heap is made.	MCS1 (p. 18) MCS3 (p. 5-6) MCS2 (p. 2, 5, 15) MCS4 (p. 14-15)
Did the resources help the learners to understand what is being taught to them?	Yes, because almost all the learners could answer the questions and those who did not know, learnt from the others who answered the questions. Just one learner scored 1 out of 6 in the formal worksheet they had to complete. Yes, because almost all the learners could answer the questions and those who did not know, learnt from the others who answered the questions. Only one learner scored 3 out	MCS1 (p. 23-24) MCS2 (p. 18-19)

	of 10 in the formal worksheet they had to complete. The rest all scored more than 50%. Yes, because almost all the learners could answer the questions and those who did not know, learnt from the others who answered the questions. More than half of the learners scored 50% and more in the formal assessment worksheet that they did. Yes, because almost all the learners could answer the questions and those who did not know, learnt from the others who answered the questions.	MCS3 (p. 18-19) MCS4 (p. 2-15)
Did the resources help the learners to acquire new skills?	Yes, how to maintain a balanced diet and how to plant carrot seeds. How to keep their teeth and eyes healthy. Yes, because they understood why water is important and that it should not be wasted but used sparingly. Yes, because they understood why traffic signs should be obeyed and it should be used. Yes, because they now understand why waste should be managed and how it could be managed.	MCS1 (3, 4, 5, 6, 9, 10, 15-18) MCS2 (p. 3-8) MCS3 (p. 2-6) MCS4 (p. 2-15)
Did the resources help the learners to value the content knowledge that they have learnt?	Yes, because they understood why healthy food should be eaten and how we can give back to the natural environment on which we are dependant for survival. Yes, they understood why water should be saved and how they can save water. Yes, because they understood why and how traffic rules should be used for their own safety and those of others. Yes, because they understood what effects	MCS1 (p. 6-9) MCS2 (p. 3-15) MCS3 (p. 2-9)

	waste can have on the human life and other living organisms.	MCS4 (p. 2-8)
Did the resources help the learners to apply what they have learnt in their everyday lives?	Yes, because they don't bring unhealthy food such as sweets etc. to school anymore. They also planted the carrot seeds themselves. Yes, because no more dripping taps are found in the toilet. Yes, because they told the teacher what is happening in the roads and how they are using the road after learning about the traffic rules? Yes, because they now know what effects waste have on human life and other organisms and how we can deal with it.	MCS1 (p. 18) MCS2 (p. 17) MCS3 (p. 16-17) MCS4 (p. 2-8)

Theme 3: Equity

SUB-THEME	COMMENTS	SOURCE
Were all the learners included in the lesson through active learner participation?	Yes, by answering questions orally. Reciting the rhymes, completing written activities, completing a questionnaire, planting carrot seeds and doing formal worksheet at the end of the teaching and learning process. Yes, because they answered questions orally. Did an inquiry and also did a formal worksheet at the end of the teaching and learning process. Yes, because they answered questions orally. Reciting a rhyme. Doing an observation in the environment about how the road is used. Writing a letter to the traffic department and completing a formal worksheet about the teaching and learning process.	MCS1 (pp. 2-24) MCS2 (p. 2-18) MCS3 (p. 2-19)

	Yes, because they answered questions orally. Completing worksheets and collaboratively making a compost heap	MCS4 (p. 2-15)
Were all learners treated fairly in the lesson in terms of the content knowledge taught to them in the lessons?	Yes, because all of them were included in all the activities of the lesson. Through intent listening and participation.	MCS1 (pp. 2-24) MCS2 (p. 2-18) MCS3 (p. 2-19) MCS4 (p. 2-15)
Were all learners treated with respect?	Yes	MCS1 (pp. 2-24) MCS2 (p. 2-18) MCS3 (p. 2-19) MCS4 (p. 2-15)

Theme 4: Responsiveness

SUB-THEME	COMMENTS	SOURCE
Were all learners given a chance to raise their opinion in the lesson?	Yes, because the teacher always posed the questions to the class group as a whole.	MCS1 (pp. 2-24) MCS2 (p. 2-18) MCS3 (p. 2-19) MCS4 (p. 2-15)
How did the learners respond to the content being taught to them?	The learners were very excited and all of them wanted to give their contribution at the same time. They enjoyed the lessons.	MCS1 (p. 2-24) MCS2 (p. 2-18) MCS3 (p. 2-19) MCS4 (p. 2-15)
Did the teacher respond to individual needs, such as individual diversity, difference in	No Yes	MCS1 (pp. 2-24) MCS2 (p. 2-18)

learning environments, learning abilities and styles?	No	MCS3 (p. 2-19) MCS4 (p. 2-15)
Did the lesson allow the learners to be themselves during the lesson through learning interactions?	Yes, they looked at ease and interacted well with their peers.	MCS1 (pp. 2-24) MCS2 (p. 2-18) MCS3 (p. 2-19) MCS4 (p. 2-15)

Theme 5: Relevance

SUB-THEME	COMMENTS	SOURCE
Was the content and objectives based on achievement to meet the needs of learners, community and the nations?	Yes, because to maintain a healthy diet means that your body will be healthy which we all need to learn, work and play. Yes, because they told the teacher that they are saving water now. That the signs are helping them to remember how to save water. Yes, because they told the teacher that they are using the road correctly. Yes, because they could tell the teacher how waste can be managed after the topic was taught to them.	MCS1 (pp. 2-24) MCS2 (p. 2-18) MCS3 (p. 16-17) MCS4 (p. 13-15)
Was the issue/risk/concern based on the learners' immediate life worlds?	Yes, because in life we need to maintain a balanced diet in order to stay healthy. Yes, because everybody all over the world need to save water. Yes, because they should know how to use the road correctly for their own safety and those of others.	MCS1 (pp. 2-24) MCS2 (p. 2-18) MCS3 (p. 2-19)

	Yes, because waste management is an issue around the globe.	MCS4 (p. 2-15)
How much of the learners existing knowledge was used to bring understanding towards the unknown content?	Right through the lesson the teacher first asked the learners what they know about the different parts of the lesson before giving the information to them.	MCS1 (pp. 2-24) MCS2 (p. 2-18) MCS3 (p. 2-19) MCS4 (p. 2-18)

Will the learners be able to apply this new knowledge in their own life worlds, nationally and globally?	Yes, because a balanced diet is something that all human beings need to maintain. Yes, they will be able to save water as they now know how important water is to all living things and that we need to use it sparingly. Yes, they will be able to use the road correctly as they now know how important the road signs are to all road users. That to obey it is for our own and others safety. Yes, because they could explain to the teacher the different ways on how waste can be managed.	MCS1 MCS2 (p. 2-18) MCS3 (p. 2-19) MCS4 (p. 13-15)
--	--	---

Theme 6: Reflexivity

SUB-THEME	COMMENTS	SOURCE
Did the learners understand the importance of the issue/risk/concern?	Yes, they now know that to eat unhealthy food can make them sick. Yes, because they now know that water is life. Without it we cannot live. Yes, they now know that if they don't obey the traffic rules they might get bumped by a car and this can cause serious injuries even death. Yes, the now know that waste is dangerous and cause harm to the environment and that it needs to be managed in order to keep the environment clean and healthy	MCS1 (p. 10) MCS2 (p. 3-5) MCS3 (p. 2-19) MCS4 (p. 2-15)
What solution did they come up with to address the issue/risk/concern?	They decided to plant carrot seeds which they can eat in order to improve their eye sight. They decided to make signs that show how to save water. They decided to write a letter to the traffic department. They made a compost heap.	MCS1 (p. 11, 13) MCS2 (p. 14) MCS3 (p. 11) MCS4 (p. 12-13)
Did all the learners give their input in this process of the lesson?	Yes, some of them just observed while others did the planting work and some others watered the planted seeds. Yes, each learner had to make a sign. Yes, some gave suggestions while the others were listening to their suggestions. Yes, because some were observing, while the others put the layers on the compost heap and some were answering the questions that the	MCS1 (pp. 15-18) MCS2 (p. 15) MCS3 (p. 10-11) MCS4 (p. 12-13)

	teacher posed to them.	
Did this change their perspective about the issue/risk/concern?	Yes, they came up with solutions to the issue.	MCS1 (pp. 11, 13) MCS2 (p. 14) MCS3 (p. 11) MCS4 (p. 8-11)
How did they react to the issue/risk/concern in totality?	They wanted to do something to change the fact that what if there is no food left to buy in the shops. They wanted to do something to change the fact that they are wasting water and want to save it. They wanted to do something to keep them safe while on the road and also to ensure that the traffic is being regulated for their safety. They wanted to do something to keep the environment clean and also to reuse the waste that could be reused.	MCS1 (p. 11, 13) MCS2 (p. 14) MCS3 (p. 10-11) MCS4 (p. 8-15)
Could they come up with the solutions?	Yes, they could. They decided to ask the parents to pack them healthy food for break time and to plant carrot seeds. Yes, they could because they came up with the solution to put up signs. Yes, they could because they told the teacher what to write in the letter that was to be posted to the traffic department. Yes, they could because they told the teacher that the waste should be recycled, reused and reduced.	MCS1 (p. 11, 13) MCS2 (p. 14) MCS3 (p. 10-11) MCS4 (p. 8-15)
Will/could the solution bring about	Yes, because they can eat the carrots themselves or they can sell it to buy	MCS1

realistic change in the environment?	something else that they can use in class.	
	Yes, water can be saved and used sparingly.	MCS2
	Yes, the traffic flow will improve if the traffic officer will come and regulate it in the mornings and afternoons.	MCS3
	Yes, it can because a clean environment is of benefit to all living organisms	MCS4

Theme 7: Sustainability

SUB-THEME	COMMENTS	SOURCE
What action was taken for the environment to bring about change?	The learners decided to plant seeds to do something for the environment from which they are living from every day to survive.	MCS1 (pp. 11, 13)
	The learners decided to make signs on how to save water and use it sparingly.	MCS2 (p. 14)
	The learners decided to write a letter to the traffic department.	MCS3 (p. 11)
	The learners made a compost heap to reduce organic waste materials.	MCS4 (p. 11-13)
Was it a direct/indirect action?	This was a direct action because the learners planted the seeds themselves. Indirect because they asked in a letter that the parents should pack them healthy food.	MCS1 (p. 11, 13)
	It was a direct action because the learners made the posters themselves.	MCS2 (p.15)
	It was an indirect action because the issue was taken forward to the traffic department by sending a letter to them.	MCS3 (p. 11)

	It was a direct action because the learners made the compost heap themselves with the guidance of the teacher.	MCS4 (p. 11-13)
Did the action taken come from the learners themselves or did the teacher ask them to take this action?	The action came from the learners themselves. The action was introduced by the teacher but the learners did it themselves with the guidance of the teacher.	MCS1 (p. 11, 13) MCS2 (p. 14-15) MCS3 (p. 11) MCS4 (p. 11-13)
Was the action discussed that was taken for the environment at the end of the lesson and was there any alternative suggestions made?	Yes, it was discussed and everybody was satisfied about the action that they took and no alternative suggestions were made.	MCS1 (pp. 22) MCS2 (p. 17) MCS3 (p. 16-17) MCS4 (p. 13-15)
What went well and what was done for it to be successful?	The planting of the carrot seeds went well. The learners first observed the demonstration on how to plant carrot seeds and thereafter they did it themselves with the guidance of the agriculture teacher. The making and putting up of the signs went well. All learners worked together as a team and the teacher was also assisting them where help was needed. The action that was taken didn't go that well because the no traffic officer appeared at the school to come and regulate the traffic. What went well is that the learners are now following the traffic rules and even telling their drivers to drive safely. The action that was taken went well. The learners made the compost heap	MCS1 (p. 11) MCS2 (p. 15) MCS3 (p. 16-17) MCS4 (p. 11-13)

	perfectly with the guidance of the teacher.	
Can the action that was taken be applied in the community, nationally and globally?	Yes, planting seeds can be done all over the world. Yes, putting up signs to save water can be done all over the world. Yes, traffic safety is important all over the world. Yes, making compost heaps can be done all over the world.	MCS1 MCS2 MCS3 MCS4

Appendix J: Letter of permission to the principal

Dear principal

Hereby I would like to inform you about the research project I want to conduct here at our school for my Masters in Education (Environmental Education) research project at Rhodes University. The research project is about an investigation about the relationship between the use of an active learning framework and educational quality in the Namibian Environmental Studies Curriculum. In the data generation process of the research project I need to conduct interviews, have workshops and focus group discussions, do classroom observations and analyse documents.

The interviews I need to conduct will be with the English stream teachers of grades two to four. I also need to conduct focus group discussions with these teachers to discuss the interviews conducted with them. By conducting a workshop I will also introduce the active learning framework to them as a method of teaching and learning that might improve the educational quality of Environmental Studies. Furthermore, I will also observe their lesson presentations which we will plan in the focus group discussions according to the active learning framework. Lastly, I would like to analyse their lesson preparations to familiarise myself with the preparation of the presentations and also to analyse some of the learners work done at the end of each lesson presentation to get a sense on how well the learners have accumulated lesson content.

The reason why I want to conduct this research study is to give me as an educator and the rest of the Lower Primary teachers at the school a method to teaching and learning that might promote the educational quality in Environmental Studies.

All information conducted in the research project will be seen as highly confidential and will be treated as such and will be used for the purpose of this research project only. Hereby I want to ask you as the principal of the school to grant me permission to go ahead with the above mentioned. All information that will be generated for this study is to improve the educational quality of Environmental Studies with the aim to improve the learners' quality of life through the use of an active learning framework as an intervention tool to address environmental issues, risks, concerns in Environmental Studies to achieve sustainability. Furthermore, to ensure the validity I will do member checking with the teachers of all data collected. You as the principal of the school and all participants will also receive a copy of the final thesis after the completion of the research project.

You co-operation will be highly appreciated.

Yours sincerely

Ms N. Jacobs

Principal: Ms X Xxxxxx

Appendix K: Consent letter to teachers

Dear Ms Xxxxxx

Hereby I would like to inform you about the research project I want to conduct here at school in your grade 4 B class. The research is for my Masters in Education (Environmental Education) research project at Rhodes University. The research project is about an investigation between the use of an active learning framework and educational quality in the Namibian Environmental Studies Curriculum.

The information that I would like to obtain from you is to conduct an interview with you about Environmental Studies. I would also like to have a focus group discussion with you and the rest of the English mainstream teachers to discuss the information of the interviews conducted with you. Furthermore in this process I will also introduce the active learning framework to you as an intervention tool as an approach to teaching and learning to establish if it might promote the educational quality of Environmental Studies. I would also want to observe 2-3 lesson presentations in your class to see if the active learning framework might promote the educational quality of Environmental Studies. I would also like to analyse your lesson preparation before the presentations to familiarise myself with the content of the lesson. Lastly I would also like to analyse some of the learners work to see how much of the content presented to them they have accumulated. All the information that will be gathered for this research project will be kept highly confidential and will be used for this research project only.

Hereby I want to know if you would grant me permission to conduct the above mentioned. All the information that will be conducted is to give the Lower Primary teachers at our school a method to teaching and learning that might promote the educational quality of Environmental Studies at our school and to develop sustainability practices at our school to learn how to use our natural resources wisely and to learn how to address environmental issues/risks/concerns in our communities.

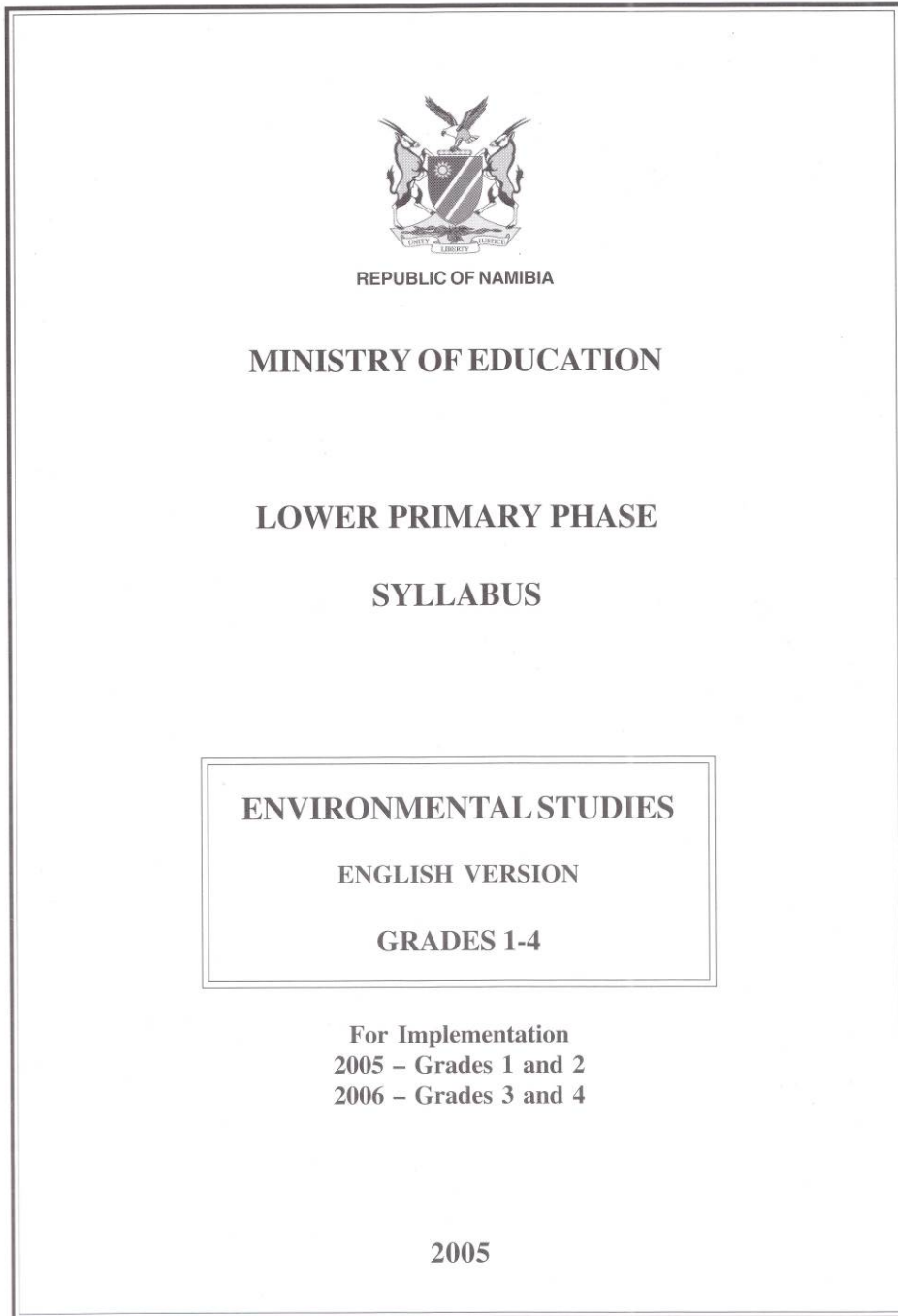
Your co-operation will be highly appreciated.

Yours sincerely

Ms N. Jacobs

Grade 4 B class teacher Ms X Xxxxxx

Appendix L: Environmental Studies Curriculum (2005)



First Language

Second Language

Mathematics

Environmental Studies

Arts

Religious & Moral Education

Physical Education

CONTENTS

1. INTRODUCTION	91
2. RATIONALE	91
3. BASIC COMPETENCIES AND LEARNING OUTCOMES	91
Learning Outcomes	91
4. PARTICULAR FEATURES OF THE SUBJECT AT THIS PHASE	91
5. SUMMARY OF LEARNING CONTENT	91
6. THE LEARNING CONTENT: GRADES 1-4	92
7. LINKS TO OTHER SUBJECTS AND CROSS-CURRICULAR ISSUES	93
8. GENDER ISSUES	93
9. LOCAL CONTEXT AND CONTENT	94
10. APPROACH TO TEACHING AND LEARNING	94
11. OUTLINE OF LEARNING CONTENT	95
12. ASSESSMENT	95
13. SYLLABUS GLOSSARY FOR LOWER PRIMARY PHASE: ENVIRONMENTAL STUDIES	95

1. INTRODUCTION

This syllabus describes the intended learning and assessment for Environmental Studies in the Lower Primary Phase. As a subject, Environmental Studies integrates the Social and Economic and Natural Scientific areas of learning in the curriculum. The themes and topics of Environmental Studies are content matter in all other subjects across the curriculum.

Under optimal circumstances, this subject would need 3 periods per week in Grades 1 and 2 and 5 periods per week in Grades 3 and 4.

2. RATIONALE

As a subject, Environmental Studies integrates learning about the natural and social environment, first and foremost related to the learners' immediate environment and community. The world around us is complex and needs to be understood holistically. Environmental Studies responds to this complexity by studying content in an integrated manner. This integrated approach enables learners to see society and nature as a whole, rather than by learning about them in separate subjects. Firstly, it involves beginning to understand past and present human behaviour and experience, and how they influence events, circumstances and the environment. It also involves beginning to understand how the natural environment is composed and functions, and what our responsibility is towards the environment. Thirdly, our own physical, mental and emotional health is a meeting point between the social and natural environment and is thus central to the subject.

Learning experiences in the social sphere help learners see and understand the relationships between people and between people and their environments. It deals with interaction within the social, civic, political, economic, cultural and natural environments. It helps learners to become responsible citizens in their community, and eventually their country, continent and the world, through the development of essential knowledge, understanding, skills and attitudes. Learning experiences in the natural scientific sphere aim at increasing the learners' knowledge and understanding of the physical and biological world of which they are part. This includes understanding how people use the natural environment to satisfy human needs, and how the environment may be changed in ecologically sustainable ways. Critical thinking, investigating phenomena, interpreting data, and applying knowledge to experimental skills are essential to understanding the value and limitations of natural scientific knowledge and methods, and their application to daily life. The combination of developing positive values and attitudes towards and scientific knowledge about health, is of special relevance for the individual, the family, and society as a whole.

Environmental Studies promotes the following aims in the curriculum guide:

- 3.3.1 - develop a lively, questioning, appreciative and creative intellect, enabling learners to discuss issues rationally, to make careful observation and analysis, to experiment, to think scientifically, solve problems, and apply themselves to tasks
- 3.4.3 - enable learners to obtain the knowledge and understanding, skills and competencies, and attitudes and val-

ues needed for their personal development, related to the changes in Namibian society

- 3.5.1 - develop attitudes and practices and further knowledge and activities which promote physical and mental health
- 3.7.1 - promote democratic principles at school level in the educational system, and in civil life
- 3.7.2 - develop the learners' social responsibility towards other individuals, family life, the community and the nation as a whole
- 3.7.3 - promote equality of opportunity for males and females, enabling both sexes to participate equally and fully in all spheres of society and all fields of employment

3. BASIC COMPETENCIES AND LEARNING OUTCOMES

On entry to the Lower Primary Phase, all learners will have experiences and awareness of their social and natural environment. Environmental Studies will build on that experience and awareness and develop competencies in order to achieve the aims of the study.

Nearly all learners will be able to achieve more than a satisfactory minimum in the basic competencies, some will be able to do much better. A few learners will just be able to manage satisfactorily, and must receive support teaching through adapted teaching approaches, adapted materials, and assistance from peers.

A very small number of learners have special educational needs to a degree that requires greater individual attention or resources. Some will have handicaps that do not necessarily limit cognitive and affective learning and development (visually impaired, hearing impaired, physically handicapped). Learners with Downs's syndrome, other forms of mental handicap, or Attention Disability Disorder, will have very differing basic competency profiles. Teaching materials and assessment for these learners will be more specifically adapted in inclusive classes.

Learning Outcomes

On completing Grade 4, the learners can look after their own basic health and nutrition, interact positively in the social environment, and act responsibly towards the natural environment.

4. PARTICULAR FEATURES OF THE SUBJECT AT THIS PHASE

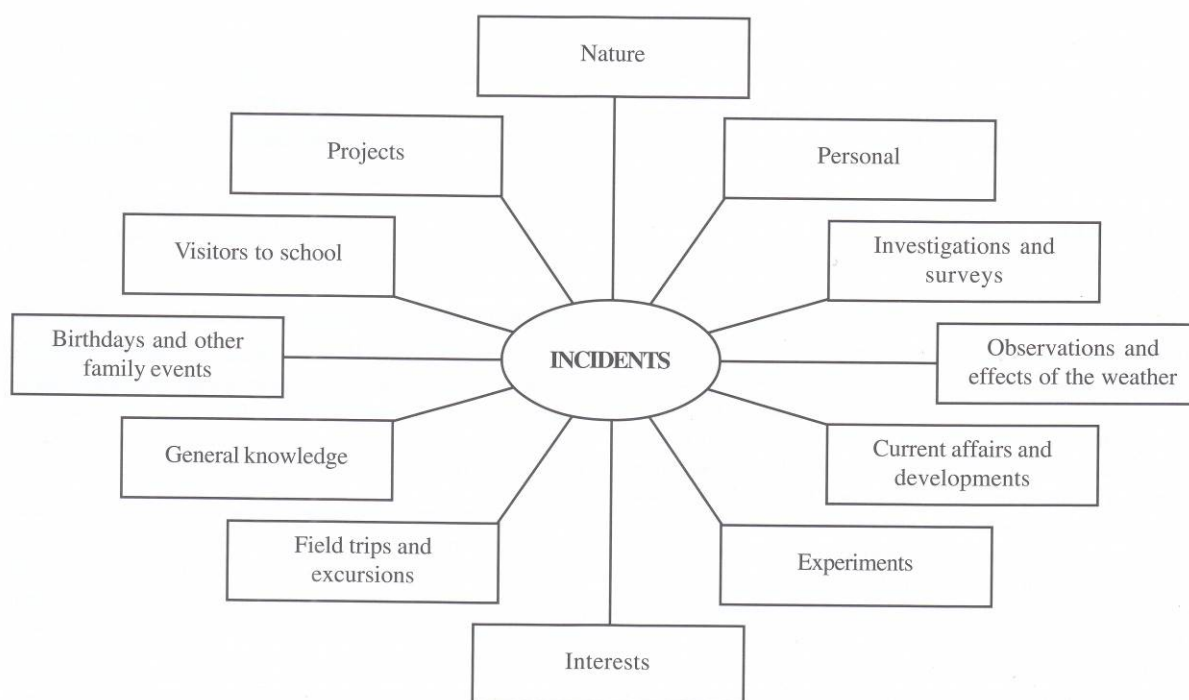
The Lower Primary Phase places most emphasis on understanding the local social and natural environment and applies new concepts in a known context. The transition to English in Grade 4 makes particularly great demands on the learner, and most of the material in Grade 4 is therefore a consolidation in English of what has been learnt in Grades 1-3, with code-switching to the first language where necessary and some more depth in certain topics.

5. SUMMARY OF LEARNING CONTENT

The syllabus comprises three main themes: The Social Environment, Health and Nutrition, and The Natural Environment. However, the themes are not to be seen as separate compart-

ments and topics should be taught across all three. In addition, teachers should note that there are certain aspects that should not be taught as separate entities and at fixed times during the school year. These aspects may be grouped under

the topic 'Incidental' as represented in the diagram below and should be taught at appropriate times of the year or as interest arises more spontaneously:



6. THE LEARNING CONTENT: GRADES 1-4

The syllabus is not a fixed sequence for teaching the topics within each year. While each of the topics should be thought

of as representing a series of related lessons – never a single lesson – teachers should develop sequences according to their knowledge of the learners and the local context.

	GRADE 1	GRADE 2	GRADE 3	GRADE 4
The Social Environment	Social Groups and Institutions - The family as a base social group - One social service as a health provider Culture - Culture in the family - Symbols of national culture Infrastructure and Communications - Infrastructure and communications in the home and local community - Traffic safety - Safety on the way to school	Social Groups and Institutions - Own identity in a family group - Local social networks - Local sources of help and service Culture - Local culture - National culture Infrastructure and Communications - Traffic safety - Buildings - Transport and communications	Social Groups - Family - Other social groups - Social service providers Culture - Cultural diversity - National culture - Public holidays marking important national events Infrastructure and Communications - Traffic safety - Transport and communications - Housing before and now	Our Regions - Origins of the people of our region - Our family life - Geography of our regions Culture - The culture of our region - Historical places and famous people Infrastructure and Communications - Means of transport and links in our region - Communications - Current issues and events in the region

	GRADE 1	GRADE 2	GRADE 3	GRADE 4
The Social Environment (cont.)	Economic Activity - The family as an economic unit - Entrepreneurship	Economic Activity - Shops and markets in our local community - Entrepreneurship	Economic Activity - Our resources - Crafts and factories - Economic activities in our rural and urban areas - Entrepreneurship	Economic Activities - How our early people lived - Farming, fishing and mining - Entrepreneurship Civics of our Region - Social Groups - How our region is governed - Security and social services in our region
Health, Safety and Nutrition	Health and Safety - Personal health - Care of oneself and others - Personal safety as part of well-being Nutrition - Healthy/unhealthy food	Health and Safety - Personal hygiene - The senses - Contagious diseases Nutrition - Preparing food - Local food	Health and Safety - Infectious diseases - HIV/AIDS Nutrition - Food storage and preparation - Food from Namibia	Health and Safety - My body - Growing up - My Self - HIV/AIDS Nutrition - Good nutrition
The Natural Environment	Plants - Local plants Animals - Domestic/wild Weather - Seasons Water - Water is life Environmental Care - Keep the environment clean	Plants - Basic characteristics - Spread - Germination Animals - Animals as part of the food chain Weather - Seasons Environmental Care - Water: the most important resource	Plants - Growth - Identification Animals - Interdependence of animals and their habitat Weather - Interdependence of climate and environment Environmental Care - Clean water	The Living World - Living or non-living? - The needs of living things - Plants as important sources of food and raw materials - Animals as living things The Non-living World - Materials and their characteristics - Water - Soils types - Light - Sound Environmental Care - A healthy environment - Plant and animal conservation

7. LINKS TO OTHER SUBJECTS AND CROSS-CURRICULAR ISSUES

The themes and topics of Environmental Studies are extended across the curriculum in other subjects. Environmental Studies is also the main carrier subject of the cross-curricular themes of HIV and AIDS Education, Human Rights and Democracy, Population Education and Environmental Learning.

The syllabus is a framework outlining objectives, approaches and competencies. In the classroom, however, a different type of syllabus can be used based on thematic webs, where a

chosen theme is studied and the material outlined in the syllabuses in different subjects is organised around that theme. Thus, Mathematics will be applied to the theme being studied, and language work will focus on it, as well as Environmental Studies, Arts and Religious and Moral Education (see next page).

8. GENDER ISSUES

Including gender perspectives is important in all social themes in order to raise awareness of gender stereotyping, how limitations are set on gender equity, and how to promote

Cross-Curricular Issue	Environmental Studies	Language	Mathematics	Arts	Religious & Moral Education
Environmental Education	Natural Environment: Impact of human behaviour on water, plants, weather	Talking, listening to and reading stories, creative writing about the environment	Data handling: Picture graphs – consumption of water per week	Collage, using materials from the environment; visual art, songs and drama about the environment	Stories about the creation and environment; environmental values education
HIV and AIDS Education	Caring for our environment Healthy eating; Health services; Behaviour towards and care for relatives/friends/ neighbours	Talking, listening to and reading stories, creative writing about health, caring, illness, death	Data handling: Pictographs; Time; Money	Drawing, painting, songs, drama, about HIV and AIDS, and about one's own feelings about it	Stories about care, comfort and healing of sick people; the value of life and the individual
Population Education	Impact of settlements on the environment	Talking, listening to and reading stories, creative writing about families	Data handling: Picture graphs – boys and girls in the class/family	Population issues expressed through drawing, music, drama	Customs, beliefs and values of
Human Rights and Democracy Education	Culture: Customs and religious ceremonies Traditional stories The right to shelter, clean water & environment, food and education	The right to one's own language; talking, listening to and reading stories, and writing in one's own language	Data handling: Picture graphs	Visual art, songs, music, drama about Human Rights, Children's Rights, Rights of the Girl Child; expressing oneself freely	The right to freedom of religion

gender equity in all spheres of life. In Science activities related to studying the natural environment, it is particularly important for girls to feel confident from the start in order to provide motivation to continue in Natural Science throughout their school career and beyond.

9. LOCAL CONTEXT AND CONTENT

In the Lower Primary Phase, the content of Environmental Studies is very largely taken from and related to the learners' immediate environment and community, hence the name of the subject.

10. APPROACH TO TEACHING AND LEARNING

The approach to teaching and learning is based on a paradigm of learner-centred education described in Ministry policy documents, curriculum guides, and the Conceptual Framework document. This approach ensures optimal quality of learning when the following principles are put into practice:

The aim is to develop learning with understanding, and the skills and attitudes to contribute to the development of society. The starting point for teaching and learning is the fact that the learner brings to the school a wealth of knowledge and social experience gained continually from the family, the community, and through interaction with the environment. Learning in school must involve, build on, extend and challenge the learner's prior knowledge and experience.

Learners learn best when they are actively involved in the learning process through a high degree of participation, contribution and production. At the same time, each learner is an individual with his/her own needs, pace of learning, experiences and abilities. The teacher must be able to sense the needs of the learners, the nature of the learning to be done and how to shape learning experiences accordingly. Teaching strategies must therefore be varied but flexible within well structured sequences of lessons.

The teacher must decide, in relation to the learning objectives and competencies to be achieved, when it is best to convey content directly, when it is best to let learners discover or explore information for themselves, when they need directed learning, when they need reinforcement or enrichment learning, when there is a particular progression of skill or information that needs to be followed, or when the learner can be allowed to find their own way through a topic or area of content. Work in groups, in pairs, individually, or as a whole class must therefore be organised as appropriate to the task in hand. Co-operative and collaborative learning should be encouraged wherever possible. In such cases tasks must be designed so that pair or group work is needed to complete it, otherwise the learners will not see any relevance in carrying out tasks together. Project work in group can be used frequently as the learners develop social skills. As the learners develop personal, social and communication skills, they can gradually be given increasing responsibility.

to participate in planning and evaluating their work, under the teacher's guidance.

Because of the language transition in Grade 4, more time should be spent working in depth with each topic. The natural environment component has less emphasis on accumulating facts and more on enquiry activities. Such activities do not require specialised equipment: everyday objects and materials are much more suitable for Lower Primary teaching. Hands-on activities stimulate exploratory talk among learners. That assists in developing and practising the language needed for understanding. The social environment component needs more discursive language and time should be spent assisting learners in being able to express what they think.

1. OUTLINE OF LEARNING CONTENT

See pages 96 to 115.

2. ASSESSMENT

Assessment in Environmental Studies in the Lower Primary phase includes informal less structured and more structured continuous assessment, done during normal classroom activities. Continuous assessment is most important for following the learner's progress and giving feedback on an ongoing basis. The main purpose of assessment will be to obtain as reliable a picture as possible for the learners' progress and level of achievement in relation to the competencies. Assessment information will be used to:

Inform the learner and her/his parents of progress and achievements

Inform the teacher of problems in the learning process and guide compensatory teaching

Evaluate the teaching/learning process in order to adapt methods and materials to the individual progress and needs of each learner to continually improve the working atmosphere and achievements of the class.

A broad range of informal assessment procedures should be used, such as practical tasks, observational techniques, informal questioning, discussion and peer assessments, etc. Assessments must be related to the objectives for each topic and may include individual, pair and group activities. The learners' participation and involvement and their contributions to group work must also be taken into account. At each step of the learning process, the teacher must be sure that the learners are achieving the basic competencies.

In addition to ongoing informal less structured continuous assessment, there should also be more structured continuous assessments. At the end of each term an average grade or the continuous assessment done should be recorded and reported to the learners and parents.

The levels of grading are:

- A: The learner is outstanding and has achieved all the competencies exceptionally well.
- B: The learner has achieved all the competencies very well.
- C: The learner has achieved all the competencies satisfactorily.
- D: The learner has achieved most of the basic competencies.
- E: The learner has achieved only a few of the basic competencies.

Points, ranging from 5=A to 1=E, should be used to average out marks and then converted into letter grades.

No percentage marks are being used at this level.

13. SYLLABUS GLOSSARY FOR LOWER PRIMARY PHASE: ENVIRONMENTAL STUDIES

NB: The meanings given here apply to the word in the context of this syllabus only and not necessarily to any other context.

Adolescent – a person between childhood and maturity

Adoption – to take a child into a family as a son or daughter

Amplitude – the greatest distance from resting of a plucked string; the greatest height of a sound wave

Domesticated – of animals, tame or household

Ecocycle – the cycle of the interdependence of living things and the natural environment

Foster – to promote growth and development

Frieze – patterned ornamental strip on a wall

Germinate – to make seeds grow

Holistic – treatment of any subject as a unified and integrated system

Hygiene – the science of the maintenance of health

Hypothesize – to formulate an idea to be tested

Infrastructure – man-made structures such as roads, buildings and communications

Mammals – vertebrates whose females feed their young with milk from the mammary glands

Nuances – subtle but important differences in meaning

Nutrition – intake of food; study of food intake

Pedestrian – a person who walks in traffic

Phenomenon – anything perceived as an occurrence or fact by the senses

Properties – characteristic features of a thing

Resonance – sound vibrating through the air or a substance

Symbol – an object or image representing a deeper meaning

Utility – usefulness

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 1, the learners can:
GRADE 1			
PREPARATORY ACTIVITIES			
• Myself	• Know and understand the body, the body parts and emotions	• Name and describe the different body parts and activities the body can perform, e.g. run, walk, sit, stretch, balance, etc. • Identify expressions of emotion and explain reasons for mood changes • Explain differences and similarities in people's bodies and characteristics that can change (length, weight) and that cannot change (eyes, skin colour)	• Distinguish between the parts of the body and their functions • Recognise various feelings and emotions and how they can change
1. THE SOCIAL ENVIRONMENT			
• Social Groups and Institutions - The family as a base social group - Local health providers	• Learn the value of good family relationships • Learn about health services and their role in the community	• Draw their family members; role play family situations; discuss what makes a good family life • Identify health care providers; role play visits by health workers or visits to health institutions	• Distinguish between good and poor family relationships • Name basic health care providers in the home and community and explain their roles
• Culture - Culture in the family - Symbols of national culture	• Be aware of customs and ceremonies in everyday life • Understand and respect the value of a national president, national flag and National Anthem	• Discuss customs and ceremonies the family has or participate in • Discuss what these symbols mean • Discuss when the National Anthem is sung and why; behave appropriately when the National Anthem is played or sung • Discuss why Independence Day is an important day in Namibia's history, and how we celebrate it • Draw and colour the flag and discuss where it is flown in the local community • Describe/role play what it must be like to be President and lead our country	• Explain own family customs and ceremonies • Sing the National Anthem together with others showing correct behaviour • Describe the design and colours of the Namibian flag • Identify and name the President

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 1, the learners can:
• Infrastructure and Communication - Infrastructure and communication in the home and local community - Transport and communication - Traffic Safety	• Understand that housing varies • Identify what transport and communication are used in the local community • Understand the dangers in traffic and how to behave as a pedestrian and when riding a bicycle • Understand the potential dangers on their way to school	• Discuss what houses look like; building materials used; draw their houses • Identify the similarities and differences between various houses • Discuss various means of spreading news and of communicating • Draw and label pictures of the means of transport • Draw and describe road signs • Discuss how pedestrians should behave in traffic; point out danger spots in the local environment • Practise traffic behaviour • Describe their way to school and draw attention to potential dangers	• Describe their house and furniture • Describe their family's means of transport and communication • Identify the most important road signs for them in the local environment • Explain the dangers on or near a road and demonstrate how to cross a road safely • Identify and explain potential dangers on their way to school
• Economic Activity - The family as an economic unit - Entrepreneurship	• Understand that all family members can contribute to productivity • Understand why earning and saving money is important for the family	• Discuss who does paid/unpaid work; work in the home/outside the home; the purpose of earning money for the family • Draw up a class overview of occupations of family members (including housekeeper) • Discuss what articles learners could make and sell to earn money	• Describe the occupations of their family members, and examples of entrepreneurship in the community • Explain why a family needs money and savings
2. HEALTH, SAFETY AND NUTRITION • Health and Safety - Personal health	• Understand the importance of personal hygiene and health	• Discuss the importance of both exercise and health • Discuss and practise daily routines to keep hair, skin, nails, ears, nose, eyes, hands, teeth and feet clean	• Explain why personal hygiene, body exercise and rest are important

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 1, the learners can:
• Health and Safety (cont.) - Care of oneself and others - Personal safety as part of well-being	• Understand how to care for others while protecting oneself • Understand how to take care of themselves in potentially dangerous situations	• Practise tending simple skin wounds • Discuss fear of contact and how to overcome it; the importance of caring and physical contact for HIV&AIDS infected • Identify potentially dangerous situations and places in the home, school and local environment, why they are dangerous and how to avoid them • Discuss and practise how to say “no” in an uncomfortable, potentially dangerous situation or touching; where to go for help • Learn yes/no forms of contact	• Describe precautions when tending to wounds • Describe what contact is safe with people with HIV&AIDS and what must be avoided • Describe danger and safety measures in the home, school and immediate environment
• Nutrition - Healthy/unhealthy food	• Understand what food and eating habits are necessary for their growth and health	• Discuss and illustrate healthy food and a balanced diet, and unhealthy food • Identify locally available food	• Explain what is healthy food which should be eaten regularly, and healthy eating habits
3. THE NATURAL ENVIRONMENT			
• Plants - Local plants	• Learn about plants in their environment and the growth cycle	• Observe trees, bushes and grasses in the environment • Collect specimens of leaves, bark, seeds, roots • Compare and label • Learn which are poisonous • Observe germination of different types of seeds	• Identify and name trees, bushes and grass from their own environment, and their main parts • Identify and name poisonous plants in their environment • Describe how seeds germinate

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 1, the learners can:
Animals - Domestic/Wild	Understand the differences between domestic and wild animals	- Collect observations from learners' pets; observe if possible - Discuss and draw main domesticated animals - Project work on different wild animals through drama, story telling and art	Explain the difference between domestic and wild animals, including their main physical features and feeding habits
Water - Water is life	Understand the importance of clean water and recognise some basic properties of water	- Discuss why we need water and why only clean water should be drunk - Demonstrate a way to purify water at home - Experiment with water: objects float or sink; water in different shape containers - Identify local water sources	- Identify and name sources and uses of clean water - Describe two physical properties of water
Weather - Everyday is a weather day	Become aware of weather conditions and seasons	Observe the weather regularly and keep a simple chart (sun, cloud, rain, wind, cold, warm, hot, very hot)	Compare and describe different weather conditions (sunny, cloudy, windy, rainy)
Environmental Care - Keep the environment clean	Understand the importance why humans should keep the environment clean	- Discuss why a clean and tidy school is necessary; take turns to tidy the classroom - Participate in cleaning-up activities of the school environment	Explain the importance of a clean environment

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 2, the learners can:
GRADE 2			
1. THE SOCIAL ENVIRONMENT			
Social Groups and Institutions - Own identity in a family group - Local social groups - Local sources of help and service	- Understand that being a member of a family as a social group is part of one's identity - Realise that there are different ways of describing family membership - Understand the importance of being a member of social groups - Understand that a community is a network of social groups - Understand that a society needs services, such as post office, clinic, police, etc.	- Draw family trees showing their own place in, and other members of, the immediate and extended family. - Write the names and draw the people - Compare family trees: find who is related within the class - Discuss important nuances in terms of family relationships in African languages represented in the class/Namibia, for which English is inadequate (e.g. meanings of "uncle" and "aunt", "sister" and "brother") - Discuss fostering and adoption as ways of including orphans in a family group - Discuss and draw web diagrams of formal and informal groups they belong to, e.g. who they play with; which church they go to; also what groups or clubs older brothers and sisters belong to, and which their parents belong to - In groups, list what they think are community services and what are not - Compare and clarify - Present through dramatisation and drawing	- Explain why it is important to be a member of a family - Distinguish between immediate and extended families - Describe main social activities in the community - Describe main social services in the community
Culture - Local culture	Appreciate how customs and celebrations are linked to special events or make ordinary events special	- Discuss what special days, events and ceremonies are celebrated and how (e.g. special forms of dress, music, ways of behaving) - Draw and dramatise these events	Describe customs and cultural expression in the local community

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 2, the learners can:
• Culture (cont.) - National culture	• Get a sense of the fact that colours and shapes of the national flag have specific symbolic meanings in context • Appreciate that national leaders are respected for their position and deserve courteous treatment	• Guess what the colours and images could mean; find out the intended meanings; draw/colour the flag, write the word for each symbol • Discuss what happens when a dignitary visits; who is shown on TV, talked about on radio, or pictured in newspapers at official ceremonies; opening of Parliament; Independence Day	• Explain what the colours and images of the national flag mean • Explain why and how local and national leaders are honoured
• Infrastructure and Communication - Traffic safety - Buildings - Transport and communication	• Develop responsible behaviour in traffic • Appreciate the variety of homes and buildings in the local environment • Appreciate how transport and communication knit the community together	• Observe and tell about good and bad traffic behaviour in the environment • Roleplay, and discuss how to behave safely in traffic • Draw pictures of good traffic behaviour • Collect and make group exhibitions with labels of small samples of materials used in building their homes, and other buildings • Discuss how the same basic materials can be used to create different forms and structures • Draw and discuss all types of transport they see in the local environment • Draw and discuss all forms of communication used	• Describe how one should behave in traffic as a pedestrian and as a passenger in a vehicle • Describe and name building materials used in the local environment • Describe the roles of public transport and means of communication in the community
• Economic Activity - Shops and markets in our local community - Entrepreneurship	• Understand the role of shops, markets and entrepreneurship in their local community	• Discuss why people go to shops and markets • Visit a local shop and market and compare them • Role of the shopkeeper/stallholder • Role play trading • Raise funds through class projects	• Describe traditional and modern ways of trading and selling and the role of shopkeeper/customer • Explain the worth of entrepreneurship

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 2, the learners can:
2. HEALTH, SAFETY AND NUTRITION			
• Being a healthy person - Personal hygiene - The senses	• Understand and be motivated to practise personal hygiene • Appreciate how clothing varies according to circumstances • Become more aware of and understand the senses	• Discuss why we should wash/bathe regularly; where we should and should not bathe and why • Discuss the importance of clean clothes • Relate types of clothing to customs or age group, social events, activities and seasons • Draw and label the different types of clothing • Concentration and sensitivity games for sight, hearing, touch, smell and taste • Describe the sensations • Basic care of eyes, ears, nose, mouth	• Explain why personal cleanliness is important • Describe appropriate clothing for certain events or weather conditions • Explain the sense organs and how to take care of the nose, ears, eyes and mouth
• Nutrition - Preparing food - Local food	• Understand the importance of handling food hygienically • Know which food products are available locally	• Bring fruit, vegetables and edible roots (if available) to be washed/peeled • Identify which can be eaten raw when washed and/or peeled, and which must be cooked • Discuss how and why boys and girls can both help prepare food at home • Find out what food can be found naturally or is produced locally, and classify according to source • Make displays with drawings, packaging labels, and/or samples	• Explain how to handle food hygienically and why hygiene is necessary • Identify local foods and their sources
3. THE NATURAL ENVIRONMENT			
• Plants - Basic characteristics	• Understand that plants can be identified by characteristics of the leaves and seeds	• Collect and compare 4-5 leaves and seeds, classify them by size and shape, identify and label them	• Identify local plants by their leaves and seeds

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 2, the learners can:
• Plants cont. - Spread of seeds - Germination	• Understand that seeds spread in controlled and uncontrolled ways • Develop their skills of observation and comparison of germination	• Discuss the dispersal of seeds (wind, water, cultivation, through birds and animals) and find examples from the local environment • Sow seeds and observe and draw germination • Discuss similarities and differences from observations	• Describe how seeds are spread • Describe the germination of the seeds which were observed
• Animals - Animals as part of the food chain	• Begin to understand the food chain	• Observe, draw and describe 3-4 insects and birds: appearance, habitat, feeding habits, enemies • Discuss and draw feeding habits of domestic animals, and what food and other products come from them	• Describe the differences between insects and birds, and their place in the food chain • Describe food and other products from pigs, goats, sheep, and cattle
• Weather - Seasons	• Understand identifying features of the seasons	• Observe and record weather conditions on a chart, at intervals • Identify seasonal changes	• Account for seasonal changes in weather conditions (temperature, rain, wind, clouds)
• Environmental Care - Water: the most important resource	• Understand the importance of conserving water as part of the ecocycle	• Locate where water is stored in the environment; how water can become polluted; how it is purified • Discuss why water must be used sparingly; what happens if it is not • How water can be saved in the home	• Explain how and why water can be saved and stored

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 3, the learners can:
GRADE 3			
1. THE SOCIAL ENVIRONMENT			
• Social Groups - Family - Other social groups - Social service providers	• Understand how sharing work in the home helps strengthen the family • Understand how social groups form a network of interests and voluntary services in the community • Understand how essential public services are organised	• Dramatise and discuss what each person does at home; how work can be shared; what they can contribute • Build on Grade 2 and extend the picture of the local community: church groups, youth, sports, culture, HIV/AIDS groups, etc. • Dramatise some of the roles • Discuss and draw the local clinic, agricultural extension, police, security, water, other services, and people they know who provide the services • Visit some of the institutions • Invite providers to visit the class	• Describe how the roles of family members complement/support each other • Describe the occupations of their family members • Explain what different social groups in their community do • Describe various public services provided in their own community
• Culture - Cultural diversity - National culture - Public holidays marking important historical events	• Appreciate that one nation is made up of many cultures of equal value • Understand that older and newer forms of leadership exist side-by-side in Namibia • Understand that images of animals and plants can be more than just a picture or decoration, and can have meaning • Appreciate that some events in history have shaped everyone's life	• Share information about cultural traditions represented in the class • Ask community members about traditions or find information (pictures, videos) about cultural traditions in Namibia • Learn songs from different cultures • Discuss how traditional leaders are chosen and what they do compared to political leaders • Discuss the characteristics of the fish eagle, oryx and welwitschia; improvise and mime stories about them using simple masks. Discuss how characteristics are used to create wider meaning • Discuss what a public holiday is and whom it is important for; what people do on public holidays • Draw pictures and write about the holidays	• Describe traditions of different cultures in Namibia • Explain main functions of traditional leaders • Explain what the symbols on the Namibian coat of arms mean • Distinguish between religious and non-religious holidays

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 3, the learners can:
- Infrastructure and Communication - Traffic safety - Transport and communication - Housing before and now	- Understand that traffic safety depends on correct behaviour and following safety codes - Extend their knowledge of transport and communication - Appreciate infrastructure development over time	- Draw and label the most important road signs for cyclists - Practise hand signals cyclists must show, hand signals traffic officers give and correct response - Basic traffic rules for cyclists - Build on the knowledge of local transport and communications from Grade 2 - Find out what other types of transport there are beyond the local community but within the region - Draw/make models of traditional homes and shelters - Discuss what is similar/different to housing today	- Explain road safety and traffic rules for cyclists - Describe transport and means of communication in the region - Compare traditional homesteads and shelters to modern buildings
- Economic Activities - Our resources - Crafts and factories - Economic activities and entrepreneurship in our rural and urban areas	- Appreciate natural resources in their region and that they must be used with care - Learn about different crafts and factories in the region - Appreciate the need for different occupations in rural and urban areas	- Write in table/diagram form the natural resources of their region and what the uses are - Find out what are the sources of fresh water supply - Give examples of limited resources - List crafts practised in their region - Find out what products are made by factories in the region - Visit and describe a factory or hand craft centre - List and compare the work of people in different settlements - Discuss how different jobs complement each other - Compare entrepreneurship in urban and rural settings (e.g. craft products; income-generating activities, services) - Class projects for fund raising	- Present findings on natural resources in visual form and comment on them - Describe what craft and factory products are made in the region - Account for the main occupations in the region - Participate in entrepreneurial activities

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 3, the learners can:
2. HEALTH, SAFETY AND NUTRITION			
• Health and Safety - Infectious diseases - HIV and AIDS	• Understand how to avoid infection from the most common diseases • Understand the difference between HIV and AIDS and other diseases and become confident in interacting safely with people who are infected with HIV and AIDS	• Discuss and do a class survey of what illnesses the learners and members of their families have had; identify and write down the most common infectious diseases, their symptoms and how they are spread • Discuss how HIV and AIDS is different from any other infectious disease by breaking down our immune system • The need for extra care and love for those who have HIV and AIDS • How we can interact closely without becoming infected	• Describe the signs and symptoms of the most common infectious diseases in their environment • Investigate how they can be prevented • Describe how to behave towards people infected with HIV and AIDS
• Nutrition - Food storage and preparation - Food from Namibia	• Understand the importance of proper storage and preparation of food • Understand interdependence of regions in supplying food to everyone in Namibia	• Find out different ways in which food is stored at home and in the local environment (homes, farms, shops); different ways food is prepared; how to know food is properly cooked • Find out, draw and label what food is gathered and/or produced in other parts of Namibia	• Explain the correct storage and preparation methods of food and why these are important • Name and explain how foods are produced in Namibia
3. THE NATURAL ENVIRONMENT			
• Plants - Growth - Identification	• Understand how plants grow from cuttings • Be able to identify trees in their environment • Be able to identify harmful/poisonous plants in their environment • Identify Namibia's national plant	• Each learner plants a cutting; cares for it and records growth weekly • Collect leaves/flowers/seeds/bark from different (indigenous) trees • Draw the trees, mount the samples and label them • Do as above with harmful/poisonous plants in the local environment • Draw and discuss the <i>Welwitschia mirabilis</i> and what makes it unique	• Describe how plants grow from cuttings • Identify different types of trees in the environment • Distinguish between poisonous and non-poisonous plants in their environment • Explain why the <i>Welwitschia mirabilis</i> is special and needs conservation

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 3, the learners can:
• Animals - Interdependence of animals and their habitat	• Appreciate that animals and their habitat are interrelated	• Identify reptiles in the local environment • Identify dangerous snakes • Find out about and draw the fish eagle and another water bird • Find out about seawater or freshwater fish • Find out about the oryx's appearance, habitat, what makes it unique • Collect information on prehistoric animals and why they died out, draw, model	• Distinguish between the basic physical features, habitats and feeding habits of reptiles, water birds and fish • Describe basic features and characteristics of the oryx • Describe similarities and differences between prehistoric animals and present day animals
• Weather - Interdependence of climate and environment	• Understand that there is an interrelationship between weather and the natural environment	• Regularly record weather observations and changes and discuss their effects on the environment, animals and people	• Describe the effects of the four seasons and rainy and dry periods on plants and animals
• Environmental Care - Clean water	• Understand the importance of clean water	• Investigate where water is found in the environment; sources of pollution; purification of water	• Describe how water becomes polluted and how it can be purified

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 4, the learners can:
GRADE 4			
1. THE SOCIAL ENVIRONMENT			
• Our Regions - Know the regions - Origins of the people of our region - Our family life	• Learn the names and boundaries of the regions of Namibia • Develop an understanding of the various origins of people in their region and why some of them moved • Deepen their knowledge about the importance of family life	• Work in pairs/groups with maps with regional boundaries • Place name labels where they think they belong; check • Repeat with competitions for quickest completed, correct map • Investigate the various origins of the learners in their classroom and teachers in their school and list reasons why some moved away • Describe how the family helps children to develop the body (physically), the mind (mentally), and the behaviour in the group (socially) • Give examples of a family member teaching what is right and wrong (values) and caring for others • List the rights and duties of family members • Dramatise a simple case of participatory decision-making in a family • Find out by collecting articles/pictures from newspapers/magazines to show how women's roles are changing	• Locate and name the regions of Namibia on a map • Explain why some people in their region have moved between regions/countries • Explain why family life is important for every individual • Give examples of how the role of women is changing
• Our Cultures - The culture of our region - Historical places and famous people - African unity	• Appreciate different customs and traditions in their region • Learn about historical events • Discover more about African Unity	• Describe/dramatise a traditional celebration/ceremony • Act out a short performance of traditional songs, music and dancing • Tell a traditional story to the class group • Identify and make a display of craft • Locate historical places in their region, describe what happened there, who was involved; make a model or draw a picture of one historical place • Understand and respect the value of the anthem of the Organisation for African Unity (OAU)	• Describe/present different cultural traditions in the region • Explain the importance of at least two historical places in the region • Name historical persons of their region, and give reasons why they are important • Sing the OAU anthem together with others, showing respect

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 4, the learners can:
• Infrastructure and Communication - Means of transport and links in our region - Communication - Current events and issues in the region	• Understand the functions of transport and transport links in the region • Appreciate communication as the transfer of ideas and information • Develop an interest in current issues and events in their region	• Collect and present information on different forms of transport before and today in their region; what different forms of transport are used today; draw transport links to other regions on a map of Namibia • List different means of communication; write a letter to a class mate as a friend informing him/her about any event in their region; role-play telephone conversations; describe different types of programmes on the radio and TV; present daily news as if on the radio • Collect and report new events from newspapers, radio, TV, family, other people, present as if a radio announcer; interview classmates on their opinion	• Make a presentation on the use of different forms of transport in the region and links to the rest of the country • Describe main means of communication in the region • Make a presentation on a current event in the region
• Economic Activity - How early people lived - Farming, fishing, mining - Entrepreneurship	• Discover how early people in their region provided for their basic needs • Understand the importance of agriculture, fishing and mining • Develop entrepreneurial skills	• Find out about the way of life of early groups of people in Namibia • Discuss different types of farming in their region today and its importance; fishing and mining activities in the region/Namibia • Class project to raise funds making and selling things, services etc.	• Present information about the life of early people in the region • Distinguish between farming, fishing and mining activities and explain their importance • Participate in entrepreneurial activities and handle business transactions correctly
• Civics of our Region - Social Groups - How our region is governed	• Understanding that people form groups of common interest and can elect representatives • Understand what the work of a Regional Council is	• List groups of common interest to which family members and relatives belong; describe what the interests of their groups are; discuss rules of one organised group they belong to; conduct an election for class representatives • Find out about the activities of a Regional Council; discuss problems the Council is faced with, and suggest solutions	• Participate in an election for class representatives • Describe the basic functions of the Regional Council

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 4, the learners can:
• Civics of our Region (cont.) - Security and social services in our region	• Develop an understanding of social problems in the region and how they are dealt with	• Give examples of problems people have in their region; discuss what people themselves can do to solve these problems; find out what security and social services in their region do to help people	• Explain the functions of social and security services in the region
• Geography of our Region - Location and physical features - Weather, plants and animals - Our settlements (towns, villages and farms) - Our population distribution	• Appreciate main geographical features of their region • Understand what makes up the weather • Learn about vegetation and animals in their region • Learn to differentiate between different types of settlements and reasons for their siting and distribution • Understand population distribution and the need for planned urban development	• Indicate the four main directions; describe the location of their region on a map of Namibia using a direction pointer; identify natural features • Observe and record the weather for the region; listen to a weather report in English on radio/television and report back to the group/class what information it gave • Find out about, draw and label common plants in their region • Find out about, draw and label animals in their region • Identify towns, villages and rural settlements of their region; find out reasons (physical, political) for the siting and distribution of settlements, starting with their own • Use a map to find out how the population of their region is distributed; find out reasons for the distribution of the population, including unplanned urbanisation; discuss problems of unplanned urbanisation and ways of improving life in poor, densely populated areas	• Describe the natural landscape of their region, e.g. (mountains, plains, dunes, rivers, lakes, dams, hills) • Describe weather patterns in different seasons • Describe vegetation and animals in the region • Distinguish between different types of settlements and give reasons for the siting of their own • Explain dense and spread population and why unplanned urbanisation is a problem

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 4, the learners can:
2. HEALTH, SAFETY AND NUTRITION • Health and Safety - My Body - Growing up - My Self	• Identify the functions of human sense organs • Investigate the functions of the human skeleton and muscles • Understand the digestive system • Differentiate between growth and development and appreciate differences in growing up • Become aware of self a responsible individual and learn how to protect themselves against child abuse	• Experiment with and give examples of different kinds of information received by the sense organs (smell, visual, pain, hot/cold, texture, sound, taste) • Find out how the skeleton is a frame for attachment of muscles; how they work for movement; identify parts of the body protected by the skeleton • Work out the human digestive path and describe it in simple terms; describe the functions of chewing; find out why humans have a long digestive path • Investigate and make charts of similarities and differences in external features of classmates (height, foot size, waist, eyes, etc.) by age and sex • Identify stages of the human life cycle (baby, child, adolescent, adult) and how the body changes • Discuss how each person is responsible for the care of his/her body, and to respect others; what things it is necessary to say 'No' to; describe steps in making decisions; where can we find information; what choices do I have? identify influences on decision making; discuss being a boy or a girl; affection and sexual harassment; role play "saying no"; practise changing male behaviour	• Describe the functions of human sense organs • Describe the functions of the skeleton and muscles • Describe the digestive system • Explain the main bodily changes of the life cycle • State in which situations they should and can say No • Demonstrate how to say No

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 4, the learners can:
• Health and Safety (cont.) - HIV and AIDS	• Understand what HIV and AIDS is and the effect on family, friends and society	• Discuss what the learners know and believe about HIV and AIDS; find correct information about what it is, how it is transmitted; safe ways of relating to HIV-positive people; how to prevent becoming infected; how it affects individuals, families and communities • Role play/Discuss feelings about HIV and AIDS – fear, silence, stigmatisation, resignation – and how to overcome these; how to be a good friend to someone who is HIV-positive or whose family is affected by HIV and AIDS • Role play/discuss how to build hope and confidence for one's own future and how to support others in doing so	• Explain correct basic facts about HIV and AIDS • Explain what reactions and feelings people have about HIV and AIDS • State what they will do to ensure they lead a positive, healthy lifestyle and help others to do so
• Nutrition - Good nutrition	• Understand the importance of good nutrition and a balanced diet	• Find out what food is healthy food, what is not and why • Discuss what a balanced diet is and why it is important for the body • Discuss how food should be stored, prepared and eaten • Analyse what they eat over a typical week; make a healthy snack at school	• Explain what is healthy food and a balanced diet • Name the main food groups
3. THE NATURAL ENVIRONMENT			
• The Living World - Living or non-living? - The needs of living things	• Distinguish between living and non-living things • Understand animals' specific requirements for life • Understand the specific requirements for life for plants	• Identify key characteristics of living things and sort living from non-living things on the basis of these characteristics • Identify basic needs of animals and compare the needs of a domestic animal with the needs of people • Identify basic needs of plants and compare with the needs of people	• Describe the difference between living and non-living things • Explain the basic needs of animals and plants

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 4, the learners can:
• The Living World (cont.) - Plants as living things - Plants as important sources of food and raw materials - Animals as living things	• Understand the relation between external parts of a plants and their functions • Understand that flowering plants grow and produce seeds, which then produce more plants of the same kind • Appreciate the importance of plants for animal (including human) life • Understand the functions of observable parts of animals in relation to their needs • Understand differences in animal reproduction and care of the young	• Recognise, draw and name external parts of plants and describe the function of each, compare and draw the leaves of six different kinds of plants and find reasons for the differences • Observe, draw and comment on the development of seeds and flowers of six different local plants • Identify and give examples of parts of plants which humans use for food: leaves, fruit, stems, roots; find out which animals are herbivores • Find out about how people use leaves and stems as materials for shelter, tools, making things; use pictures, drawings and words to make an information chart about the uses of one plant in the community • Investigate how observable parts of three local insects, fish and birds are used to meet their needs • Investigate how an insect, bird and mammal reproduce and take care of their young	• Name the external parts of plants and describe their function • Present their observations of the growth of flowering plants • Present a project on main types of plants used for food, shelter, tools, textiles, baskets and other items • Distinguish between the body parts of insects, birds and fish • Describe how the body parts of insects, birds and fish are used to meet their needs • Describe how insects, birds and mammals produce and take care of their young:
• The Non-living World - Materials and their characteristics	• Relate the characteristics of materials to their utility	• Investigate characteristics for distinguishing between materials • Motivate reasons for selecting materials for specific purposes (strong, cheap, heavy, etc.) • Experiment freely and describe effects of folding/rolling paper to give strength; weaving cloth, grass or leaves; shaping and firing clay; carving wood; cooking food	• Describe the characteristics of different materials and account for how characteristics can be changed • Select the correct materials for a specific purpose

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 4, the learners can:
• The Non-living World (cont.) - Water	• Investigate observable properties of water	• Recognise and describe characteristics of water such as flow, shape of drops, surface of water in containers • Experiment with, describe and sort materials which float or sink • Compare the amount of water absorbed by different materials like paper, cloth, wool • Observe and describe what happens when substances such as salt and sugar are added to water	• Present and explain their findings about the observable properties of water
- Soils	• Recognise and describe components of soils	• Identify various components in a soil sample: clay, sand, pebbles, dead plant parts • Compare soils from three different locations, using the observable components	• Present their findings about the various components of soil
- Light	• Identify sources of light and understand how light creates shadow	• List a variety of sources of light: sun, moon, flames, light bulbs • Distinguish objects that emit their own light from those that require an external source of light in order to be seen • Observe and make diagrams/charts of changes in location and size of shadows in the early morning, midday and late afternoon • Predict and verify changes in the location and size of shadows	• Identify and name sources of light • Present their findings about light and shadow
- Sound	• Understand the source of sound and how its characteristics can be varied	• Experiment with sounds to produce high/low pitch, loud/soft dynamics, short or sustained resonance • Use words to describe different characteristics of sound • Hypothesise about what causes sound; discover that sound is the result of vibration and varies according to the amplitude	• Present their findings about the source and characteristics of sound

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will:	APPROACHES Suggested activities that could lead to achieving the competencies:	BASIC COMPETENCIES By the end of Grade 4, the learners can:
Environmental Care - A healthy environment	Develop understanding that a healthy environment is important for our basic needs, and develop a sense of care for the environment	- Find examples of things around us which may affect the health of our bodies and describe how they do so; identify the characteristics of a healthy community; suggest how the environment can be improved - Brainstorm how people use their environment to provide for their basic needs; find examples of damage to the environment in their region; classify damage to the environment caused by human activities and damage caused by weather e.g. litter, cutting of trees, storms - Discuss ways in which we can take care of the natural environment in every day life; design a poster to encourage people to save water - Find out which plants and animals need to be protected and why	- Distinguish between environmental factors affecting health negatively and positively - Describe ways in which they can contribute to environmental care - Explain why it is important to protect species of plants and animals
- Plant and animal conservation	Appreciate the need to protect wild plants and animals		