The experiences of Grade 5 learners of an enriched Natural Sciences curriculum

by

MARIANA DE VOS

Submitted in partial fulfilment in accordance with the requirements for the degree of

MAGISTER EDUCATIONIS

(Educational Psychology)

In the
Department of Educational Psychology
Faculty of Education
University of Pretoria

SUPERVISOR
Prof Ronél Ferreira

CO-SUPERVISORS
Prof William Fraser
Mrs Karien Botha

MARCH 2017

Declaration

I, Mariana de Vos, student number 26345243 hereby declare that this dissertation, "***The experiences of Grade 5 learners of an enriched Natural Sciences curriculum***" is submitted in accordance with the requirements for the Magister Educationis degree at the University of Pretoria and is my own original work and has not previously been submitted to any other institution of higher learning. All sources cited or quoted in this research paper are indicated and acknowledged with a comprehensive list of references.

....

Mariana de Vos

31 March 2017

Financial Assistance

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Faculty of Education

RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	CLEARANCE NUMBER: UP 12/09/02 Botha 16-003
DEGREE AND PROJECT	MEd
	The experiences of Grade 5 learners of an enriched Natural Sciences curriculum
INVESTIGATORS	Ms M de Vos
DEPARTMENT	Educational Psychology
APPROVAL TO COMMENCE STUDY	28 August 2015
DATE OF CLEARANCE CERTIFICATE	16 March 2017

Please note:
For Master's application, Ethics Clearance is valid for 2 years.
For PhD application, Ethics Clearance is valid for 3 years.

CHAIRPERSON OF ETHICS COMMITTEE: Prof Liesel Ebersöhn

CC

Ms Bronwynne Swarts
Prof Ronel Ferreira
Prof William Fraser
Ms Karien Botha

This Ethics Clearance Certificate should be read in conjunction with the Integrated Declaration Form (D08) which specifies details regarding:
- Compliance with approved research protocol,
- No significant changes,
- Informed consent/assent,
- Adverse experience or undue risk,
- Registered title, and
- Data storage requirements.

Acknowledgements

To have achieved this milestone in my life, I would like to express my sincere gratitude to the people mentioned below.

- My Heavenly Father, Who provided me the strength, knowledge and perseverance to complete this study.
- Prof Ronél Ferreira, research supervisor, for her invaluable advice, guidance and inspiring motivation during difficult times throughout the research.
- Prof Billy Fraser, as co-supervisor, for his insight into the Natural Sciences and Technology curriculum.
- Mrs Karien Botha, as co-supervisor, for her guidance, support and countless hours of discussing the research.
- Mrs Kaitlyn McGoeghen, my co-researcher, for her unwavering support throughout the research process.
- Editor, Marina van der Merwe, thank you for all the technical and language editing.
- My husband, Eon de Vos, for his love and support that gave me the courage to move forward and achieve my goals. "Thank you" is simply not enough.
- My mother, Heleen van der Walt, thank you for all your love and support. Thank you for sharing in my excitement about this study.
- My father, Willie de Beer, thank you for all your love and support during all my years of studying.
- My friends and family, thank you for all your support during this journey.

Abstract

The purpose of this study was to explore and describe the experiences of Grade 5 learners after being taught Natural Sciences by means of an enriched curriculum in the Win-LIFE (Wellness in Lifestyle, Intake, Fitness and Environment intervention) project. My focus thus fell on learners' voices and perceptions, and more specifically with regard to the knowledge and skills that they gained in the Natural Sciences subject, as a result of a health-promotion intervention. For this purpose, I relied on Bronfenbrenner's Bio-Ecological model (2005) as theoretical framework, and explored the learners' experiences in a specific sub-system, being the Natural Sciences classroom and curriculum. I furthermore aimed to gain insight into how this can potentially be applied to other systems such as their home environments and personal lives.

I used the interpretivist paradigm as meta-theory and followed a qualitative approach. I selected a case study design, applying Participatory Reflection and Action (PRA) principles, thereby aligning my study's design to the broader research project for data generation and documentation I relied on multiple data generation sources, such as PRA-based workshops/discussions, observation, field notes, visual data documentation techniques and reflective journals to generate and document data.

Following inductive thematic analysis three main themes and related subthemes emerged. Firstly, the experiential learning approach that was followed when implementing the intervention had positive outcomes in terms of learners' attitudes toward learning, their commitment and self-confidence to make contributions in class, and their experiences of the learning process. Secondly, learners gained the necessary knowledge and skills of the Grade 5 Natural Sciences curriculum, and valued the practical experiences they acquired.

In addition to their newly gained knowledge and skills being retained after a year, they finally also transferred the content to their parents, caregivers and family members, and reportedly applied what they had learned at home in their personal

lives. Based on the findings of the study I can conclude that the learners experienced the enriched Natural Sciences curriculum in a positive manner and that their experiences resulted in positive outcomes and benefits for themselves and also those in their immediate environment.

Marina van der Merwe   Cell: 083 376 7367   e-mail. marina.vandermerwe@sita.co.za

27 March 2017

To whom it may concern

I, Marina van der Merwe, ID no. 680420 0110 087, state hereby that I am the editor of Mariana de Vos's dissertation.

I completed a certificate in editing form the University of Pretoria and have more than 25 years' experience in the industry. I currently work as an editor (in a permanent position) at SITA (State Information Technology Agency), where I have been responsible for editing documentation for the last 20 years.

Best regards

Marina van der Merwe

(083 376 7367)

WoutMar – Copy editing specialists

Key Terms

Enriched curricula

Natural Sciences curriculum

Health-promotion Intervention

Resource-constrained community

Participatory Reflection and Action (PRA)

Case study

Bio-Ecological model

Systems

Win-LIFE

ACRWC	African Charter on the Rights and Welfare of the Child 1999
AIDS	Acquired Immunodeficiency Syndrome
CAPS	Curriculum Assessment Policy Statement
CELCIS	Centre for Excellence for Looked After Children in Scotland
DBE	Department of Basic Education
FAO	Food and Agriculture Organization
FTFA	Food & Trees for Africa
HIV	Human Immunodeficiency Virus
MDG	Millennium Development Goals
NGO	Non-governmental organisation
SEED	Schools Environmental Education and Development
UN	United Nations
UNCRC	United Nations Convention on the Rights of the Child 1989
UNICEF	United Nations Children's Fund
WFP	UN's World Food Programme
Win-LIFE	Wellness in Lifestyle, Intake, Fitness & Environment

Table of Contents

List of Figures

List of Photographs

List of Tables

CHAPTER 1

GENERAL ORIENTATION

1.1 INTRODUCTION AND RATIONALE FOR UNDERTAKING THE STUDY

South Africa is a country characterised by discrepancies between household incomes, education levels and access to basic services (Lehohla, 2014). As an individual privileged to have had access to quality education, and as educational psychologist-in-training, I am motivated to invest in learners who are not as privileged as I have been.

I had the opportunity to work at a rural school as part of my master's degree training at the University of Pretoria, and to observe the changes that occurred among learners following an intervention that I co-facilitated. One factor that resulted in positive change relates to the presence of an individual who cares about learners' well-being, their hopes and dreams and how they can work towards achieving these. In this regard, Statistics South Africa (2000, p. 54) emphasises the notion that poverty and deprivation are multidimensional and can be seen as "the denial of opportunities and choices most basic to human development to lead a long, healthy, creative life and to enjoy a decent standard of living, freedom, dignity, self-esteem and respect from others".

The current South African context poses various challenges in the educational sector. These challenges include a lack of sufficiently trained teachers, limited resources, overcrowding of classrooms and poor infrastructure (Abrahams, 2011). Lehohla (2014) highlights the correlation between a lack of proper education and poverty. The International Food Policy Research Institute (IFPRI, 2015) similarly explains that learners will not achieve their full potential if they are malnourished. The institute also emphasises the importance of nutrition education as part of addressing the challenges associated with poverty. In this regard, the IFPRI (2015) emphasises the importance of ongoing research in nutrition education and the potential value thereof.

This study forms part of a broad research project that was undertaken in the University of Pretoria's Institute for Food, Nutrition and Well-being (IFNuW). The broad project has been conducted across disciplines, involving researchers from various departments and faculties. The project investigates how schools may be used as vehicles for change, in support of community health and well-being, more specifically related to food and nutrition. The project has, among other aspects, involved the development and implementation of a health-promotion intervention[1].

Initial implementation of the Win-LIFE intervention was done by the teachers of three schools in a resource-constrained community, as part of an enriched Grades 4 to 6 curriculum in 2014, in the areas of Life Skills and Natural Sciences and Technology[2]. The intervention was, however, implemented for a second time with Grade 5 learners in one of the three schools in 2015, based on the first round of implementation not meeting all the implementation criteria, as determined by the research team. The current study focuses on the experiences of these Grade 5 learners after being taught Natural Sciences by means of the enriched Win-LIFE curriculum, following the second round of implementation of the intervention. Co-researcher and MEd student, Kaitlyn Bentley[3], investigated the experiences of the learners in terms of the enriched Life Skills curriculum.

Broadly speaking, the Win-LIFE health-promotion intervention involved the training of teachers at the three said schools, in the Bronkhorstspruit area, in order to implement the intervention as part of the curriculum in their classrooms. The intervention takes the form of activity-based learning and emphasises the importance of sustainable living in cases where households are able to produce their own crops. The primary aim of the intervention is to enhance learners' knowledge of, skills pertaining to and attitudes about food-related choices and behaviour. The intervention furthermore focuses on the development of social

---

[1] Win-LIFE intervention = Wellness in Lifestyle, Intake, Fitness and Environment intervention, developed and implemented as a PhD study by Karien Botha.

[2] For this study, the focus falls on the Natural Sciences subject according to the Curriculum Assessment Policy Statement (CAPS), as part of the Natural Sciences and Technology learning area, for the Intermediate school phase.

[3] Bentley, K. (2016). The experiences of Grade 5 learners of an enriched Life Skills curriculum. Unpublished MEd dissertation. Pretoria: University of Pretoria

responsibility in terms of food production, food consumption and social change. Development of the intervention was based on the Millennium Development Goals 1, 2, 4, 5 and 7, as well as the potential of addressing these to some extent.

The Win-LIFE intervention was developed while considering the resource-constrained community's needs. The intervention focuses on various aspects related to food such as different soil types, the germination process, creating compost and healthy farming patterns[4]. These aspects can potentially contribute to increased knowledge, attitudes, perceptions, values and nutrition behaviour, also in terms of the possibility of initiating vegetable gardens.

Currently, research into food, nutrition and well-being is prominent worldwide (Bond et al., 2004; Student well-being team, 2006; Dodge et al., 2012). As stated, South Africa is a developing country characterised by increased levels of poverty, and related to this, high incidences of informal settlements and resource-constrained communities (Lehohla, 2014). Ferreira, Gericke and Du Toit (2013) state that in South Africa, increased levels of poverty are particularly prevalent in informal settlements as well as in rural areas and resource-constrained communities, where poor healthcare and maintaining a healthy lifestyle pose distinct challenges. In this country, 45% of the population lives impoverished, not able to meet the basic needs of food and water (Lehohla, 2014).

Oldewage-Theron and Egal (2010) explain that a quadruple burden of associated diseases is evident in South Africa. This includes infectious diseases linked to under-nutrition, chronic diseases of lifestyle (CDL) linked to over-nutrition, HIV/AIDS-related metabolic disorders and a high prevalence of injury-related mortality (Oldewage-Theron & Egal, 2010). In this regard, Ferreira et al. (2013) emphasise an increased focus on the provision of quality education and support for all learners in South Africa. Carlsson and Williams (2008) more specifically note that ongoing research is required to determine the benefits of, for example, school-based school gardens to learners, schools and communities.

---

[4] I only refer to the topics relevant to the Natural Sciences school curriculum. Topics related to Life Skills can be viewed in Appendix E, where I include the complete Win-LIFE manual.

Naidu (n.d.) highlights the importance of an enriched curriculum by viewing education as a vehicle that can shape an individual's destiny. However, in order for learners to fully benefit from education, they need to be able to concentrate effectively. Nutrition plays an integral part in learners' ability to pay attention in class and to concentrate when they are busy with school work (IFNuW, 2015). Arguments such as these formed part of the rationale for enriching the curriculum of the Natural Sciences subject, in the context of the Win-LIFE project. As the Natural Sciences curriculum, Life and Living Topic, for Grades 4 to 6 primarily pertains to germination, the different parts of a plant and the different facets of vegetable gardening (Department of Basic Education, 2011). Enriched knowledge in these areas may potentially assist schools, learners and their parents to grow their own food and to establish a sustainable food source (IFNuW, 2015).

1.2   PURPOSE OF THE STUDY

The purpose of this study was to explore and describe the experiences of Grade 5 learners after being taught Natural Sciences, by means of an enriched curriculum, in the Win-LIFE project. My focus thus fell on learners' voices and perceptions, and more specifically on the knowledge and skills that they gained in the Natural Sciences subject, which was presented to them as part of the Win-LIFE project, as well as on the potential application value of their newly-acquired knowledge and skills.

To this end, I explored the learners' experiences after being taught in an activity-based manner, with the aid of worksheets that included joint activities with their parents as homework activities. These activities formed the basis of the Win-LIFE intervention, which builds on the current school curriculum. The format of the enriched curriculum primarily differs from the existing school curriculum (Curriculum Assessment Policy Statement, CAPS) in terms of the inclusion of more activities and assignments that involve both the learners and their parents. As stated earlier, following the development of the Win-LIFE intervention, it was implemented by Grades 4 to 6 teachers in three participating schools in the Bronkhorstspruit area during 2014. In preparation, teachers were trained in July 2014 to implement the intervention over a period of eight weeks (11 August to 03 October 2014) with children in their classes.

As the planned implementation progressed, the research team became aware of the fact that the Win-LIFE intervention was, however, not being implemented as foreseen. The decision was made to re-implement the intervention during 2015 at only one of the three schools. Based on discussions with the school principal, only Grade 5 learners participated in the second round of implementation. Following the second round of implementation, I gathered data from the learners who attended the Natural Sciences classes.

Due to the Win-LIFE intervention aiming to address the food choices of learners and how they can develop healthy food-related patterns (Botha, 2014), the current study may contribute to supporting learners with regard to health and well-being by means of an enriched curriculum. As the intervention follows an experiential learning approach, new insight may potentially also be gained into suitable teaching approaches when facilitating an intervention with intermediate phase learners in resource-constrained school settings.

1.3 RESEARCH QUESTIONS

The primary research question stated below guided this study.

What are the experiences of Grade 5 learners when taught Natural Sciences by means of an enriched curriculum as part of the WIN-LIFE intervention?

In order to address the primary research question, the following secondary questions guided my investigation:

- *how does the Win-LIFE intervention's content and mode of instruction compare to the existing Grade 5 Natural Sciences CAPS[5],*
- *which knowledge, skills and attitudes are portrayed by Grade 5 learners after being taught Natural Sciences, by means of the Win-LIFE intervention;*

---

[5] In this study the term Grades 5 Natural Sciences CAPS implies reference to the Natural Sciences and Technology Intermediate Phase Grades 4 to 6 Curriculum Assessment Policy Statement (CAPS). Due to the focus of the study being the Natural Sciences curriculum, I do not include Technology when referring to the curriculum that was enriched.

- *how can Grade 5 learners apply their newly gained knowledge and skills to their home environments and personal lives; and*
- *what did the Grade 5 learners experience as valuable and as challenging during the Win-LIFE intervention?*

1.4 WORKING ASSUMPTIONS

I conducted this study against the background of the working assumptions listed below.

- The current CAPS curriculum in Natural Sciences can be enriched with content related to health and well-being.
- Grade 5 learners are able to reflect on their experiences when being taught by means of an enriched curriculum.
- Learners in the intermediate phase are able to express their experiences in English.
- Grade 5 learners are able to identify the knowledge, skills and attitudes that they acquire at school or during an intervention entailing an enriched curriculum.

1.5 CONCEPT CLARIFICATION

In this section I clarify the key concepts that relate to this study.

1.5.1 Win-LIFE school-based health-promotion intervention

Win-LIFE is an acronym for a health-promotion intervention that represents the idea of "Wellness in Lifestyle, Intake, Fitness & Environment". The broad research project aims to explore how a school-based intervention (Win-LIFE) may affect the lifestyles, nutritional behaviour and well-being of vulnerable communities. As such, the project aims to explore how schools can potentially be used as avenues to improve food- and nutrition-related practices in resource-constrained communities.

1.5.2 Curriculum Assessment Policy Statement (CAPS)

CAPS is the Curriculum Assessment Policy Statement that is currently implemented in South African schools. The Department of Basic Education (DBE)

(2011, p. 4) explains that CAPS as curriculum strives to ensure that "children acquire and apply knowledge and skills in ways that are meaningful to their own lives". In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives.

CAPS is regarded as a curriculum that attempts to streamline education outcomes by ensuring that specific content is taught during certain school terms. In this manner, all schools teach the same content at the same time (DBE, 2011). Even though the Grades 4 to 6 curricula were enriched by means of the Win-LIFE intervention, this study only focuses on the Grade 5 curriculum, seeing that the participants are Grade 5 learners.

The Grade 5 Natural Sciences CAPS focuses on two topics with various themes included in each. The first topic's themes include plants, the components of plants, what a plant needs to grow and the different types of soil. The second topic's themes include a plant's life cycle, germination, fertilisation, compost and the growth of a plant. These themes are aimed at encouraging learners to acquire the necessary stipulated knowledge, skills and attitudes that relate to the Grade 5 Natural Sciences curriculum.

1.5.3   Enriched Natural Sciences school curriculum

The Department of Basic Education (2011) explains that Sciences as known today has roots in African, Arabic, Asian, European and American cultures, and that it focuses on the notion of understanding the world. The Intermediate Phase Grade 4 to 6 Natural Sciences and Technology Curriculum Assessment Policy accordingly attempts to teach learners knowledge, skills and attitudes that can enable them to understand the world they live in (DBE, 2011).

Sproule et al. (2005) describe an enriched curriculum as an addition to the existing curriculum that is usually activity- or play-based. Furthermore, such a curriculum is described as one that is ever evolving (Sproule et al., 2001) and that can be adapted to suit the needs of the learners involved.

The Win-LIFE intervention involves enriched curricula for the Grades 4 to 6 subjects Life Skills and Natural Sciences. To this end, additional knowledge, skills and attitudes formed the focus of the enrichment. More specifically, information about vegetable gardens and related topics in general accounted for additional knowledge that the participants could gain. Ways of creating compost and vegetable gardens constituted the enriched skills that the participants could acquire. The importance of vegetable gardens as sustainable food sources answered for the attitudes and values that the participants could develop.

1.5.4   Learners

According to the Department of Basic Education (2011), a learner refers to any person who is learning, usually attending a primary or secondary school. Grade 5 learners who all come from a resource-constrained community participated in this study. The learners therefore come from a low socio-economic background that is characterised by poverty, limited resources and adversity. They are predominantly English additional language speakers and they represent various cultural backgrounds.

1.5.5   Experiences

Boud, Cohen and Walker (1993) describe an experience as an occurrence with meaning. Hornbyan (2005) explains that experiences relate to both knowledge and skills that are obtained by means of active engagement in the environment. Closely related, the APA Dictionary of Psychology (Vandenbos, 2007) highlights three factors that can result in experience. Firstly, an experience is viewed as an event that is lived through. Secondly, experiences represent specific content and, thirdly, lived events are regarded to result in learning.

In this study, experiences refer to the knowledge, skills and attitudes that the learner-participants attained as a result of the enriched Natural Sciences curriculum when participating in the Win-LIFE intervention. During data generation, I attempted to gain insight into the learners' meaning making of the content to which they were exposed, as well as the way in which they were taught.

1.6 THEORETICAL FRAMEWORK OF THE STUDY

I relied on Bronfenbrenner's Bio-Ecological model (2005) as theoretical framework for the study. An important principle of this theory that guided the manner in which I undertook this research and interpreted the results I obtained, relates to the belief that change in one part of a system will result in change in other parts (Bronfenbrenner, 1994). This furthermore implies that change in a school system (for example the curriculum) can result in change in individual and community systems. To this end, I explored the learners' experiences in a specific sub-system, namely the Natural Sciences curriculum and classroom. I aimed to gain insight into how this can potentially be applied to other systems such as their home environments and personal lives.

Bronfenbrenner (1994) structures the Bio-Ecological model according to five sub-systems, highlighting constant reciprocal interaction between the various sub-systems (Bronfenbrenner, 2005). The first sub-system is the micro-system, which is described as the system where developing individuals interact, where patterns of activities take place and where social roles and interpersonal interactions transpire in specific social, physical and symbolic structures (Bronfenbrenner, 1994). In this study, the micro-system formed the main focus pertaining to individuals' (Grade 5 learners) experiences in the school setting.

The second sub-system is the meso-system, referring to the links and interactions of a developing individual between and in different settings, for example interactions that take place between school and home (Bronfenbrenner, 2005). The third sub-system is the exo-system, which comprises the links and processes that take place between two or more settings (Bronfenbrenner & Morris, 2006). This can be explained as processes that do not directly, but indirectly, affect and influence developing individuals (Bronfenbrenner, 2005). In the resource-constrained community where the broad research project was undertaken, the community context is viewed as the exo-system.

The fourth sub-system is the macro-system, which consists of the overarching pattern of micro-, meso- and exo-systems characteristic of a given culture or sub-culture (Bronfenbrenner, 1994). Bronfenbrenner and Morris (2006) explain that the

9

exo-system relates to belief systems, resources, knowledge of the community and customs. The exo-system is thus viewed as the blueprint of a community, culture or sub-culture. Finally, the fifth sub-system is the chrono-system, which relates to the influence of time on developing individuals (Bronfenbrenner, 2005). In this sub-system, change over time in the environment is noted as also relevant to the broader research project. I present and discuss the manner in which I applied Bronfenbrenner's theory to this study in more detail in Chapter 2.

1.7   PARADIGMATIC PERSPECTIVES

According to Nieuwenhuis (2010), a paradigm entails a set of assumptions or beliefs that determines one's worldview. In the following sub-sections, I briefly introduce the epistemological and methodological paradigms I applied. I discuss these choices more comprehensively in Chapter 3.

1.7.1   Epistemological paradigm

I relied on Interpretivism as the meta-theoretical paradigm for this study. An interpretivist epistemology recognises that realities are constructed by means of people's actions and thoughts, and do not stem from an external source (Chesebro & Borisoff, 2007). Adams, Collair, Oswald and Perold (2004) explain that the interpretivist epistemology acknowledges learners' experiences as valid, multifaceted and socially constructed, as well as something that cannot be understood through objective observation. According to Jansen (2004), an individual's language and actions can only be appreciated when understanding the meaning that both the individual and the community assign to experiences, actions and language.

I used the interpretivist paradigm as lens through which to view the experiences of the Grade 5 learners after being taught Natural Sciences by means of an enriched curriculum as part of the Win-LIFE intervention. As such, I interpreted the learners' experiences while keeping in mind that meaning is constructed subjectively (Nieuwenhuis, 2010; Creswell, 2013). In this way, the interpretivist paradigm enabled me to obtain data that are rich in meaning and representative of the participants' experiences and perceptions.

Maree and Van der Westhuizen (2010) explain that an interpretivist researcher is typically empathetic and inter-subjectively immersed in the research. However, in this regard, Flick (2009) cautions that the subjective nature of interpretivist research may inhibit the generalisability of results; the researcher needs to do justice to participants when analysing data by grounding interpretations in the data. To this end, Nieuwenhuis (2010), on the other hand, notes that interpretivist research implies the understanding of a specific phenomenon from within. As such, my aim was not to generalise the results that I obtained, but rather to gain an in-depth understanding of the phenomenon I set out to explore.

1.7.2   Methodological approach

I followed a qualitative approach. Qualitative research originates in the human mind (Mouton, 2001; Nieuwenhuis, 2010) and focuses on different realities that exist. Nieuwenhuis (2010) explains that the social world cannot exist independently from the human mind and context. Nieuwenhuis (2010) furthermore describes qualitative research as a mode of enquiry that attempts to collect data about a selected phenomenon that are rich and descriptive. Similarly, Denzin and Lincoln (2005, p. 3) describe qualitative research as "a set of interpretive, material practices that make the world visible".

A qualitative approach enabled me to obtain data rich in meaning and to gain an understanding of the participating Grade 5 learners' experiences after being taught Natural Sciences by means of the Win-LIFE intervention. The applicability of qualitative research allowed me the freedom to capture learners' views and perceptions based on their specific contexts and life-worlds. As such, their voices and meaning-making ways could be brought to the fore (Nieuwenhuis, 2010).

1.8   RESEARCH METHODOLOGY

In this section, I provide a broad overview of the research design and selection of participants, as well as data generation, documentation and analysis strategies relied on in this study. Detailed discussions follow in Chapter 3.

1.8.1   Research design

Mouton (2001) describes the research design as a blueprint for conducting a study and states that this should align with the research questions. I selected a case study design, applying Participatory Reflection and Action (PRA) principles, thereby aligning my study's design with the broader research project (Ferreira, 2006). A case study design assisted me in understanding the group of Grade 5 learners' experiences after being taught Natural Sciences by means of an enriched curriculum.

Yin (2009) explains that a case study design is suitable when research requires an in-depth view of a specific phenomenon. In terms of the application of PRA principles, Mouton (2001) explains that Participatory Reflection and Action involves research where participants form an integral part of a study and where there is a commitment to involve participants in changing their social conditions. Brighton and Moon (2007) contribute to this notion by stating that such a research design can narrow the gap between theory and practice. In line with the purpose of the broader Win-LIFE project, the work of Nieuwenhuis (2010) and Mouton (2001), as well as Brighton and Moon (2007), suggests that PRA principles are not merely applied to understand a specific phenomenon but to also potentially facilitate social change when participants (learners in this case) apply their newly gained knowledge and skills to their everyday worlds.

According to Ferreira (2006), the implementation of PRA principles holds the potential of resulting in rich contextual data. I attempted to generate rich data by using PRA-based workshops, allowing for the Grade 5 learner participants' open discussions of and reflections on their experiences in the classroom. I used creative techniques (such as posters) with the learners in order to stimulate lively discussions during the data generation workshops. Throughout, I viewed the learners as the experts (Chambers, 1994).

1.8.2   Selection of case and participants

Nieuwenhuis (2010, p. 79) describes sampling as a "process used to select a portion of the population for study". I used convenience sampling to select the

research site/case and purposive sampling to select the learners who participated in this study (Maree & Pietersen, 2007). According to Etikan, Musa and Alkassim (2016), researchers will use convenience sampling when the members of a population are selected non-randomly, in a way that is practically convenient for the researcher. Purposive sampling, on the other hand, will be employed to select participants from a population that meet specified selection criteria in order to be able to address the research questions (Palinkas et al., 2013).

My reason for following this strategy is linked to the fact that the current study forms part of a broader research project that involves three specific primary schools in the Bronkhorstspruit area. In this case, the research site was pre-selected as part of the Win-Life health-promotion intervention. As part of this project, I involved the learners of one of these schools (convenience sampling), as participants. In purposefully selecting the 30 learners who participated, I applied specific selection criteria, which are stipulated in Chapter 3.

1.8.3 Data generation and documentation

I used PRA-based workshops, observation, field notes, reflective journals and audio-visual techniques to generate data and for documentation purposes (Ferreira, 2006). I specifically conducted two PRA-based workshops of 90 minutes each (Chambers, 2002) over two days in October 2015. During these workshops, I facilitated activities that prompted learners to reflect on their experiences of the Natural Sciences classes they attended when taught by means of an enriched curriculum. Learners compiled posters and discussed their experiences in small groups of five/six learners, being encouraged to express their experiences freely. After small group discussions, they reported their experiences to the larger group. This provided me with insight into the learners' experiences of being taught by means of an enriched Natural Sciences Curriculum.

I used specific prompts to guide the PRA-based activities and discussions, focusing on potential knowledge and skills that learners could have gained, as well as the way in which they may potentially apply these in future. Learners were specifically requested to focus on their experiences of the enriched curriculum.

Throughout I also relied on *observation* for data generation purposes (McClure, 2002). During the second round of implementation of the Win-LIFE intervention (August to September 2015), I fulfilled the role of field worker and co-researcher, observing the learners, context and research process. I relied on observation to ascribe meaning to the interactions between the learners, as well as to how they expressed themselves during participatory activities. I took the stance of participant-observer, where I became part of the process and discussions while observing the learners (Nieuwenhuis, 2010). In this manner, observations allowed me to make sense of what I saw and experienced.

Field notes and a reflective journal assisted me in documenting my observations and reflecting on my insights following the research process, as well as the learners' experiences as I perceived them (Flick, 2009). I attempted to capture the essence of interactions and impressions in my field notes (Flick, 2009; Mouton, 2001). In addition, my reflective journal formed part of my personal meaning-making process, allowing me to capture the unique instances I observed.

Verbatim transcripts of the audio-recordings that I made when learners reported back during the PRA-based workshops, assisted me in documenting their contributions and later analysing these. I used a voice recorder to record the sessions, which I then transcribed (Mouton, 2001). The recordings assisted me in systematically working through what was said during the PRA-based workshops. In addition, the posters that the learners compiled and the photographs I took during the sessions, provided *visual data.* Baird (1991) explains the value of using posters as part of research-focused workshops, stating that posters can encourage and promote collaborative learning, creativity and independent learning. By including photographs, I was able to capture unique moments during the PRA-based workshops that provided me with insight into the experiences of the participants (Flick, 2009).

1.8.4   Data analysis and interpretation

I conducted an inductive thematic analysis of the visual documents that were created during PRA-based activities, the transcripts of discussions, my field notes and my reflective journal (Ferreira, 2012). This manner of analysis aligns with the

interpretivist paradigm I selected, because of the paradigm's focus on people's subjective experiences. Mouton (2001, p. 108) explains that data analysis and interpretation is largely concerned with "breaking up" the data into more manageable chunks from which themes, patterns, trends and relationships become evident. Similarly, Braun and Clarke (2006) state that thematic analysis can be seen as a method of identifying and reporting patterns, themes and codes that are indicated by the data.

Inductive data analysis therefore entails the process of identifying themes from generated data (Merriam, 2009). In order to work inductively, I had to thoroughly know the data, seeing that in qualitative research, the researcher is regarded as the most important data generation instrument (Nieuwenhuis, 2010; Creswell, 2013; Denzin & Lincoln, 2000). Braun and Clarke (2006) suggest a six-phase guide to thematic analysis, which I employed.

In accordance with Braun and Clarke's (2006) guidelines, I transcribed the audio-recordings of the PRA-based discussions as the first step preparing the analysis. I then critically read through all my field notes, observations and transcriptions while starting to identify broad themes. Next I reviewed the different themes and codes to identify overlapping ideas or codes that could perhaps be grouped together. I followed a hands-on approach and assigned colours to the different themes in order for me to more easily make sense of the data. This approach furthermore enabled me to see the frequency of specific themes and to identify patterns. Once my supervisors and I were satisfied with the final themes and codes, I started recording my research findings. I discuss the data analysis that I completed in more detail in Chapter 3.

1.9   ETHICAL CONSIDERATIONS

I honoured the ethical principles of permission to conduct research, obtaining informed assent from the learners as well as consent from their parents, confidentiality, anonymity, participants' right to withdraw, trust, protection from harm and transparency of findings (Ferreira, 2012). Throughout this study, I adhered to the University of Pretoria's Code for Ethical Research (http://www.up.ac.za/media/shared/6/ZP_Files/Education/Ethics/code).

To this end, I treated the learners with respect throughout the study, attending to cultural and religious differences that could potentially have existed between the learner-participants and myself (Flick, 2009).

Permission to conduct this research had already been provided by the Gauteng Department of Basic Education when I commenced my field work. Permission had also been obtained from the three identified schools for the broader research project. However, before I conducted the PRA-based workshops, I sent out letters (Appendix B) to obtain the parents' informed consent. I also obtained informed assent from the learners (Appendix B). When introducing the study to the participating learners, I emphasised the fact that they were not obligated to participate and that they had the option to withdraw from the research at any time if they wished to do so (Mouton, 2001).

I dealt with all recorded and written data confidentially, thereby ensuring the participants' anonymity. Participants were protected from harm (emotional and physical), with me being prepared to refer learners to relevant professionals in cases where they required assistance or support. Conversely, no such incidents occurred. In Chapter 3, I explain the manner in which I followed the stated ethical principles in more detail.

1.10   TRUSTWORTHINESS OF THE STUDY

Interpretive research is usually conducted on a small scale, which implies the challenge of the findings' trustworthiness (Nieuwenhuis, 2010). Lincoln and Guba (1985) explain that in order to promote the trustworthiness of an interpretive study, the criteria of dependability, credibility, confirmability, transferability and authenticity apply. Peräkylä (1993) emphasises that trustworthiness forms an integral part of qualitative research, applying to all phases - from the manner in which data are generated to the manner in which it is sorted, classified and interpreted.

Dependability can be described as the consistency or degree of control in a study (Nieuwenhuis, 2010; Patton, 2002). I strived to obtain dependable findings by following specific operational procedures (Yin, 2009), establishing sound

relationships with the participants (Lincoln & Guba, 1985), ensuring honesty among participants (Shenton, 2003) and doing member-checking (Brewer & Hunter, 1989). The credibility of the study, which refers to the results of a study being believable (Doja et al., 2016), was ensured by discussing the significance of the results with my supervisors, co-researcher and the Grade 5 learner-participants during member-checking before finalising the themes and subthemes (Flick, 2009).

Confirmability implies that a researcher will remain objective and cautious of bias and will merely represent the experiences of the participants (Gomm, Hammersley & Foster, 2000). The confirmability of this study was warranted by means of my attempts to remain neutral and to derive my findings from the voices of the participants (Lincoln & Guba, 1985). To this end, I regularly reflected on my own experiences and potential bias, and those experiences that the participants shared with me.

Merriam (1998; 2009) describes transferability as the notion that findings in one study can be applied to another. This study may potentially assist teachers in realising the value of an enriched curriculum (Mouton, 2001) and can, in this manner, inform future related interventions or studies, even though the findings cannot be generalised to the wider population. Finally, authenticity is important in qualitative research as it concerns the relevance of the research to the participants and the community in which the research is conducted (James, 2016). I discuss the way in which I strived to adhere to these criteria in more depth in Chapter 3.

1.11   OUTLINE OF THE CHAPTERS

In this section I provide an outline of the chapters of the study.

Chapter 1: General orientation

Chapter 1 provides the relevant background to the study in terms of my rationale for undertaking this research and the purpose that guided me. I formulated research questions, stated my working assumptions and defined the central concepts. I also introduced the theoretical framework of the study, the selected

paradigms I used and the methodological choices I made. More detailed explanations of these aspects are included in Chapters 2 and 3.

Chapter 2: Exploration of existing literature

In Chapter 2 I review existing literature that relates to the focus of this study. I discuss the context of resource-constrained communities in South Africa, the importance of well-being for optimal development and middle childhood as the developmental stage of the participants. I contemplate schools' role in supporting vulnerable learners and families, the Natural Sciences CAPS for Grades 4 to 6 and the potential value of enriched curricula and school-based vegetable gardens in supporting health and well-being in vulnerable contexts. I also explain the Bio-Ecological model as the selected theoretical framework of the study.

Chapter 3: Research design methodology

Chapter 3 provides a detailed explanation of the research design and methodological strategies I used in undertaking this study. I discuss my paradigmatic choices, elaborate on the research design and selection of participants, and explain the data generation, documentation and analysis procedures I used. I also explain how I respected ethical guidelines, as well as the way in which I attempted to enhance the trustworthiness of the study.

Chapter 4: Results and findings of the study

In Chapter 4 I present the themes and subthemes that emerged following inductive thematic data analysis. I then interpret these results against the background of existing studies, thereby presenting the findings I obtained. In my discussion, I highlight correlations and contradictions and indicate where the findings of this study add to existing literature.

Chapter 5: Conclusions and recommendations

In Chapter 5 I summarise the findings of the study and come to final conclusions in terms of the guiding research questions. I identify limitations and some challenges that I experienced and foreground the potential contributions of the study. I conclude the chapter by making recommendations for training, practice and future research.

1.12   CONCLUSION

In this chapter I provided a broad overview of the study that I undertook. I introduced my focus as the experiences of Grade 5 learners after being taught Natural Sciences by means of an enriched curriculum. I motivated my interest in this specific topic, highlighted the relevance of the study against the background of existing studies, positioned my research in the broader Win-LIFE project and then formulated research questions. I explained the key concepts of the study and provided an outline of the selected paradigms, research design as well as methodological strategies I employed. I also briefly referred to trustworthiness and the ethical guidelines that I followed.

In the next chapter I explore existing literature in this field of study. These discussions form the backdrop against which I interpret the results in Chapter 4. To this end, I explore the importance of health and well-being in South African resource-constrained communities and how related challenges can be addressed. The afore-mentioned is discussed in conjunction with possible interventions with regard to children and how school curricula can be used as a possible means of addressing such challenges. Finally, I explain the theoretical framework of the study.

CHAPTER 2

EXPLORATION OF EXISTING LITERATURE

2.1   INTRODUCTION

In the previous chapter I provided a brief overview of the study. I explained the rationale and purpose of the study, stated my working assumptions, clarified key concepts and introduced the theoretical framework that guided my research. I also briefly introduced my selected paradigmatic perspectives, research methodology, quality criteria and ethical considerations.

In this chapter I explore literature that relates to the current field of study. I focus my discussion on the importance of well-being for optimal development, schools' role in supporting learners and families in resource-constrained communities, school gardens as one avenue of supporting vulnerable individuals, interventions with regard to learners by using experiential learning, and how school curricula may potentially support learners' functioning, health and well-being. I conclude the chapter with a discussion of the study's theoretical framework.

2.2   HEALTH AND WELL-BEING IN SOUTH AFRICAN RESOURCE-CONSTRAINED COMMUNITIES

South Africa is a country with high unemployment rates, poverty and related circumstances such as HIV/AIDS, malnutrition and poor education (Lehohla, 2014). South Africa is a developing country that is characterised by diversity in terms of language, culture, ethnicity and geography as well as socio-economic resource distribution. In this regard, Ebersöhn (2015) regards South Africa as the most unequal country in the world. Lehohla (2014) similarly explains that the socio-economic inequality in South Africa is among the highest in the world, resulting in large numbers of informal settlements and resource-constrained communities across the country.

Byrne et al. (2009) note that cultural differences imply a range of aspects that relate to societal structures, values and socialisation practices. These aspects

20

contribute to differences found in the meanings that individuals assign to constructs and the perceptions attached to related item content (Byrne et al., 2009). In South Africa, diversity and inequality have resulted in an array of challenges experienced in the Education sector, very specifically in terms of learners's home languages not being the national language of teaching and instruction (Ebersöhn, 2015). Both Dana (2007) and Espinosa (2005) emphasise the risk of academic underachievement when learners come from a different home language than the one used at school.

In this section I explore trends that are related to the health and well-being of learners residing in resource-constrained communities. After unpacking well-being, I describe some risks and adversity that many South African learners face, against the background of poverty as underlying factor. I also focus on specific health-related challenges before contemplating ways of addressing these in section 2.3.

2.2.1 Importance of well-being for optimal development in South Africa

In order to understand what well-being entails, it is important to note the two main trends in research in terms of well-being and what these imply. The hedonic[6] tradition's view on well-being include constructs such as happiness, positive affect and satisfaction with life (Bradburn, 1969; Diener, 1984; Kahneman, Diener, & Schwarz, 1999; Lyubomirsky & Lepper, 1999 in Igumbor et al., 2012). On the other hand, yet related, the eudaimonic[7] tradition's view on well-being is associated with optimal physical and emotional development and positive psychological functioning (Rogers, 1961; Ryff, 1989a; 1989b; Waterman, 1993 in Igumbor et al., 2012). For the purpose of this study, I integrated these perspectives, conceptualising a holistic view on well-being.

Gorman (2010) explains that well-being can be attributed to both internal and external factors. External factors include aspects such as socio-economic disadvantage and cultural disconnectedness that may negatively impact on the

---

[6] Hedonic tradition roughly translates to a specific mindset of an individual and the current needs related to well-being.

[7] Eudaimonic tradition refers to a holistic view on well-being that relate to values, morals and ethics.

social and emotional functioning of learners (Gorman, 2010). Internal factors are more difficult to define and include aspects within learners such as emotions (Dodge, Daly, Huyton & Sanders, 2012). According to Gorman (2010), the use of the concept "social and emotional well-being" since the 1980s, has resulted in a more holistic view of mental health. In this regard, Garvey (in Gorman, 2010) explains that mental health may enable learners to cope with stressors and to achieve their potential. This can, in turn, support learners to more effectively contribute to the community in terms of positive societal change and growth (Gorman, 2010).

Gorman (2010) emphasises that culture thus plays a role in the social and emotional well-being of learners, considering that culture provides the context in which one defines oneself. In order to effectively address challenges in a community, one, as a result, needs to consider the culture of the community (Gorman, 2010). Dodge, Daly, Huyton and Sanders (2012) support Gorman's (2010) stance that both internal and external factors need to be considered when addressing challenges that may hamper well-being.

Putting this into perspective, the South African culture has changed over the last few decades in terms of food provision, as food is no longer produced by households, but generally bought from convenient stores (Oldewage-Theron & Egal, 2010). Maize is no longer cultivated at home, as many unemployed people have migrated to urban areas or suburbs, moving closer to where there is work, and also closer to western influence. As a result, maize is often not regarded as the staple-food of households anymore in such areas, seeing that bread (refined sugars) has replaced maize and little, if any, fresh produce is consumed (Abrahams, 2011). This change in eating habits emphasises the importance of nutrition education in the South African context in order to support the health and well-being of individuals and families, which will ultimately effect development and performance.

A well-being approach emphasises primary prevention and early intervention in terms of all choices that effect general health and functioning. Primary prevention entails the building of structures that can facilitate belonging and promote well-

being, while early intervention involves the programming and planning of interventions that target people who have been identified as "at risk" (Student well-being team, 2006; Stratham & Chase, 2010). The schools that have been participating in the broader research project are part of the "at risk" demographic component of South Africa. To this end, the WIN-Life project involves a multi-level intervention that aims to promote learner well-being by educating teachers to present an enriched curriculum (Botha, 2014). The Student well-being team (2006, p. 4) describes well-being as follows:

> "Well-being refers to learners' physical, social and emotional development. Evidence suggests that these elements are integral rather than incidental to learning. A learner will find it difficult to engage with learning programmes if they are distracted by significant physical, social and emotional issues".

The Student well-being team (2006) furthermore explains that learners' schooling can provide a foundation for their intellectual, physical, social, moral, spiritual and aesthetic development. By providing a supportive and nurturing environment, schools can contribute to the development of learners' sense of self-worth, enthusiasm for learning and optimism for the future (WHO Expert Committee on School Health, 1997; Student well-being team, 2006). This idea emphasises the critical role that schools may play in the well-being of learners, as well as the potential value of the broader research project on food, nutrition and well-being. More specifically, food, nutrition and well-being form an integral part of the Natural Sciences Curriculum as set out by the Curriculum and Assessment Policy Statement (CAPS) (DBE, 2011). When using the curriculum to convey messages, the curriculum becomes the vehicle by means of which well-being may be promoted.

2.2.2   Risks and adversity in resource-constrained communities

People in resource-constrained communities face various risks and adversities (Lander, 2013). These include, but are not limited to, poverty, limited resources, malnourishment, HIV/AIDS, the effect of child-headed households, drugs, violence and crime (Cortina et al., 2016). A study conducted by Oldewage-Theron and Egal (2010) shows that nutrient intake in South Africa has undergone changes over the

past 50 years, with modern trends indicating an increased total saturated fat intake, decreased total carbohydrate intake and an increase in refined carbohydrate-rich foods with added sugar. Other potential changes observed by Oldewage-Theron and Egal (2010) include a decreased fibre intake and an increased intake of total protein and animal protein foods. Such dietary intake changes are typical of a westernised diet, which furthermore exacerbates the globally accepted triple burden of disease, specifically over- and under-nutrition, as well as HIV/AIDS-related disorders (Oldewage-Theron & Egal, 2010; WHO, 2015). This has in turn increased the number of child-headed households, highlighting a decline in parental care, as well as challenges with regard to food security, nutrition and well-being (SOS, 2015; WHO, 2015; Ebersöhn, 2015).

Learners in resource-constrained communities are constantly faced with the uncertainty of where their next meal is going to come from, how they are going to get to school and where to fetch water for their basic needs (MDG, 2013). According to the Child Vulnerability Index (CVI), 55.3% of South African learners are at risk (SOS, 2015). Poverty can be seen as an underlying risk-factor in resource-constrained communities and should be considered when addressing the well-being of such communities.

2.2.3 Poverty as underlying determining factor of health-related challenges

The World Bank (2016) emphasises the growing challenge of addressing poverty in Africa. Closer to home, Green, Botha and Schönfeldt (2004) emphasise that most South African households live in poverty, with a limited variety of foods available in the home and a great number of learners being malnourished and underweight. In this regard, Lehohla (2014) states that in 2011, 45,5% of the South African population could be described as poor. In 2016, a study suggested that 63% of South African learners live in poverty (Pretorius, 2016; Hall et al., 2016), which may have an adverse effect on an individual's health and well-being (SOS, 2015).

Ferreira, Gericke and du Toit (2013) explain that in South Africa, high levels of poverty are prevalent in informal settlements as well as in rural areas and

resource-constrained communities, where poor healthcare and the maintaining of a healthy lifestyle poses additional challenges. In addition, the diversity of the South African population poses various challenges in the educational context, such as poor teacher training, a lack of resources, overcrowding of classrooms and poor infrastructure. Lehohla (2014) draws a correlation between the lack of education and poverty. In support, findings indicated in the South African Early Childhood Review of 2016 (Hall et al., 2016), also highlight the notion that education is the key to addressing poverty. To this end, the World Bank (2016) is committed to invest in education in Eastern and Southern Africa in order to equip learners with the necessary knowledge and skills in support of the labour market.

Hall et al. (2016) suggest that to address the challenges that learners in resource-constrained communities face, it is important to improve education and to support health and nutrition as well as access to health services (Pretorius, 2016; Ferreira et al., 2013; Lehohla, 2014). The World Bank (2016) is furthermore dedicated to support resource-constrained communities by investing in agriculture, which may in turn address unemployment and, by implication, aspects of poverty, food security and nutrition.

2.2.4 Importance of addressing health-related challenges in resource-constrained communities

Castillo and Williams (2010) suggest that health-promotion interventions are central to addressing disease, injury and health problems, thereby enhancing the overall quality of life in resource-constrained communities. One of the primary aims of health-promotion interventions is to bring about positive change with regard to behaviour that is related to health and well-being in resource-constrained communities (Alexander, 2010; Faber et al.,2012; Botha, 2014). Challenges that may hamper well-being relate to any aspect that could have a negative impact on an individual, such as not being able to fulfil the basic needs for food and water (Rogers, 1961; Ryff, 1989a; 1989b; Waterman, 1993 in Igumbor et al., 2012). To this end, the World Bank (2016) as well as Hall et al. (2016), emphasises the importance of health and well-being to facilitate change in a resource-constrained community.

As indicated, food and nutrition-related challenges in resource-constrained communities relate to the lack of diverse nutrients in people's diets due to limited resources (Fanzo, 2012). Household food and nutrition security depends on a variety of social, economic and institutional factors that can influence the quality, quantity and affordability of food (Burchi et al., 2011; Fanzo, 2012; May, Sulla, & Zikhali, 2016). Burchi et al. (2011) emphasise the importance of ongoing research into the long-term causes and influences of nutrition insecurity and hidden hunger, with a specific focus on interventions that could potentially enhance nutrition security and sustainable living in resource-constrained communities (Hall et al., 2016). Navarro et al. (2007) highlight the importance of participatory community-based health-promotion interventions by stating that it supports overall health and well-being in resource-constrained communities.

It is suggested that such interventions should involve broad multi-sector strategies in order to effectively adapt to diverse circumstances that is specific to the context in which it is implemented (Burchi et al., 2011; SEEDS, 2014). The Win-LIFE health-promotion intervention is an example of such an initiative that has been introduced to a diverse context and sample of the South African population (Botha, 2014; Bentley, 2016).

2.3 ADDRESSING HEALTH-RELATED CHALLENGES IN RESOURCE-CONSTRAINED COMMUNITIES

Various avenues can be followed in an attempt to address health-related challenges in resource-constrained communities in South Africa. In this section I explore and describe examples of responses at international level, as well as national, community and school levels.

2.3.1 International responses to the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs)

The Millennium Development Goals (MDGs) were formulated in 2000 after the Millennium Summit of the United Nations, with the ultimate aim of addressing health and well-being in the most resource-constrained areas in the world (Noble et al., 2010). Eight MDGs were set with 21 targets as well as health and economic

indicators that were to be achieved by 2015 (United Nations, 2006). The overarching purpose was to recognise at-risk areas and to decrease the prevalence of poverty and related challenges in the identified areas.

In 2015, the United Nations evaluated the extent to which the MDGs were achieved and then formulated Sustainable Development Goals (SDGs) to build on the MDGs with the focus on economic, social and environmental factors (United Nations, 2015). The SDGs have since become the force that drives action towards reaching these goals by 2030 (United Nations, 2015).

This study forms part of a project that was intended to address health and well-being by means of a health-promotion intervention where learners acquired the necessary knowledge and skills by means of an enriched curriculum, in order to promote sustainable living by counteracting poverty (United Nations, 2015). The aims of the Win-LIFE project link to addressing MDGs numbers 1 (eradicate extreme hunger and poverty), 2 (achieve universal primary education), 4 (reduce child mortality), 5 (improve maternal health) and 7 (ensure environmental sustainability) (United Nations, 2015). In the same manner, the intervention links with SDGs numbers 1 (no poverty), 2 (zero hunger), 3 (good health), 4 (quality education) and 11 (sustainable cities and communities) (United Nations, 2015). The Win-LIFE intervention, in accordance with the MDGs and SDGs, therefore attempted to alleviate poverty by using quality education to equip learners with knowledge about, skills pertaining to and attitudes on how to address basic food needs in order to promote well-being and sustainable living in a resource-constrained community.

2.3.2 Importance and examples of community-based responses to health-related challenges in South Africa

The Department of Social Development (2016) is committed to support resource-constrained communities by means of various programmes, initiatives and collaborations with non-governmental organisations (NGOs). The United Nation's World Food Programme (WFP), Food and Agriculture Organization (FAO) (Lander, 2013), The World Bank and Schools Environmental Education and

Development (SEED, 2014), are examples of organisations that support the Department of Social Development's (2016) goals.

Examples of community projects that have been undertaken include the Early Childhood Development Programme (ECD) to promote access to early education (Department of Social Development, 2016). The ECD programme includes building Day-care and Pre-Schools, as well as training teachers in the Northern Cape, as part of the Custoda ECD Trust, where Foundation Phase teachers are trained to promote the quality of early education in the province (Kraai, 2012). The National Development Agency (NDA), as part of the Department of Social Development, also funds projects that are related to farming and sustainable living such as Women and Youth in Agriculture Cooperative (WAYCO). WAYCO is an initiative by means of which women and youth create vegetable gardens and sell the produce to local vendors (Kraai, 2013). According to FoodBank South Africa (now FoodForward SA), an estimated 14 million South Africans go hungry every day (Department of Social Development, 2016). In an attempt to respond to this challenge, the Food for All Programme, in collaboration with FoodForward SA, is committed to collect surplus foods from manufacturers and to distribute it to over 600 organisations that manage the distribution of food to individuals (Stephan, 2016).

Another example is the WeCanChangeOurWorld non-profit organisation (NPO) that was initiated by the Woolworths trust and focuses on the following four areas: Food Security in Schools; Improving Education; Orphaned and Vulnerable Learners; and Community Giving (WeCanChangeOurWorld, 2011). Each of these focus areas have different community projects to address challenges at ground level. EduPlant, supported by Food & Trees for Africa (FTFA), is yet another example of a support initiative in South Africa. It involves a 90-day workshop that focuses on supporting schools to grow their own vegetable gardens (WeCanChangeOurWorld, 2011). An FTFA Food Garden manager, Robyn Hills (www.trees.co.za, 2016), commented on this programme by saying the following:

> "... "56% of participants or community members replicate the techniques learnt
> in EduPlant food gardens at their homes or other projects. The total number of

replicated activities, as a result of the 2015/16 cycle, therefor sits on 269, as 482 schools partook in the Cluster Programme. The gardens that are created and supported through this programme produce healthy nutritious food and educate learners and adults alike about the environment, health and food production. This is at the foremost of everything we do and why we are together in this project, and indeed on this planet (www.trees.co.za, 2016, p. 1)".

The afore-mentioned projects can be seen as the outcome of government, NGO and NPO initiatives that aim to address the needs of resource-constrained communities by means of health-promotion interventions. Another example of small-scale school-based interventions that proved to be successful is kitchen gardens, which can create opportunities for real-life and authentic tasks (Sparrow, 2008). These authentic tasks can be related to various subjects such as Mathematics, Natural Sciences and Life Skills. Such interventions can in turn increase learners' levels of engagement in and motivation for everyday learning (Sparrow, 2008). The potential of kitchen gardens relates to sensory stimulation, as well as extraordinary exploration and investigation of the world (Lyon & Bragg, 2011; Alexander, 2010). Skelly and Bradley (2007) similarly conclude that school gardens can improve learners' sense of responsibility, their environmental attitudes and their attitudes towards Natural Sciences and the usefulness thereof.

2.3.3 School-based interventions in response to health-related challenges

Schools stand central to communities. Various authors emphasise the important role that education can play in promoting nutrition and well-being in South African communities (Faber et al., 2001; FAO, 2014; Lander, 2013; SEED, 2014). According to Sulkowski and Joyce-Bealieu (2014) and SEED (2014), efforts to connect learners and the community to schools should be at the forefront of current initiatives that may improve education. At a broader level, the Departments of Education and Social Development (2016) declare the importance of education being at the forefront when working towards reaching the SDGs.

Ozer (2007), Faber et al. (2001) and SEED (2014), explain how ecological theory can be used to conceptualise school gardens as examples of systemic interventions with the potential of promoting the health and well-being of individual

learners in multiple interdependent domains, and of strengthening the school environment as a setting for positive youth development. EduPlant (www.trees.co.za/programmes/eduplant.html), FTFA (www.trees.co.za/evolving-eduplant-model-has-a-finger-on-the-pulse-of sustainable-adaption.html) and SEED (2014) are NGOs that have been collaborating with the Departments of Education and Social Development (2016) in order to develop and implement sustainable systemic health-promotion interventions.

According to Ozer (2007), school-based vegetable gardens can promote the physical, psychosocial and intellectual development of school-aged learners while potentially strengthening the school setting. Thorp and Townsend (2001) support Ozer's (2007) view by emphasising the importance of gardening in changing the status of food by promoting the availability of food resources. School gardens can thus be seen as one avenue of support (Faber et al., 2001; FAO, 2014; SEED, 2014). To this end, a study conducted by Waliczek, Bradley and Zajicek (2001) indicates that school gardens imply the possibility of increasing learners' attention levels, promoting positive attitudes towards school and supporting interpersonal relationships among learners. In addition, another study by Klemmer, Waliczek and Zajicek (2005) indicates that learners who are exposed to gardening activities as part of teaching will demonstrate significantly higher science achievement scores after being exposed to activity-based/experiential teaching methods. These studies emphasise the importance of activity-based/experiential learning where young learners are actively involved in the learning process (Loucks-Horsley et al., 1990; SEED, 2014).

Garden learning is often facilitated by placing learners in groups (Beebe & Masterson, 2003), where they can work together and cooperate, in order to achieve tasks such as planting, weeding or constructing (Slavin, 1995). Garden projects involve skills and interests that are not usually associated with achievement in the traditional classroom setting, but that have real-life application. Working in groups during garden learning projects will also allow learners to cooperate with learners who normally would not interact when in a traditional classroom setting (Slavin, 1995; Alexander, 2010).

This notion contributes to the idea that an enriched Natural Science curriculum may potentially contribute to the well-being of learners. Numerous theoretical orientations such as the belongingness hypothesis (Baumeister & Leary, 2000) and Maslow's hierarchy of needs (Maslow, 1970) imply that feelings of belonging and social connectedness are fundamental human needs. Therefore, in addition to efforts to educate and nurture learners' healthy academic and intellectual development, the onus rests on schools and members of school communities to reach out and connect with learners at a social-emotional level (Sulkowski, 2014; Alexander, 2010).

A study conducted by Canaris (1995) also emphasises the value of school gardens. Canaris (1995) namely explains how various subject areas can be incorporated in a vegetable garden when following a whole school approach, implementing inquiry-based learning (Alexander, 2010). Canaris (1995) highlights the positive effects that a vegetable garden may have on learners, their parents and the community. In this regard, interaction between the learner, parents and community is crucial (SEED, 2014), as is also attempted to establish with the Win-LIFE project in support of the outcome of the intervention.

2.4   INTERVENTIONS WITH LEARNERS

It is evident that the need exists for health-promotion interventions in the South African context, especially in the school setting, which are experiential in nature and use hands-on learning (authentic learning). In his State of the Nation Address, 2010, the South African President emphasised the commitment of the South African Government to reinstating health-promoting programmes in the school curriculum. The "Schooling 2025 and Action Plan to 2014" of South Africa (DoE, 2009) has thus strived to reduce poverty and enhance health and well-being by means of the Care and Support for Teaching and Learning (CSTL) (Department of Education, 2008) programme. This programme emphasises the rights of all learners by transforming schools into inclusive centres for learning, care and support. Some of the aims of the Integrated School Health Programme are to enhance health and educational outcomes and to actively engage learners in their own development (Department of Health and Basic Education, 2012).

The possible inclusion of school-based vegetable gardens, as a form of health-promotion interventions that can be undertaken in public schools, can create an avenue to enhance health and reduce poverty in the country. This strategy, as stated previously, has been successfully applied at a global level as well as in certain South African communities. Examples of South African communities where health-promotion interventions have successfully been implemented, include Mitchell's Plain (SEED, 2014) and Ndunakazi home garden project (Faber & Laubscher, 2008). However, interventions that relate to vegetable gardens are often focused on the school and/or parents of a school, and do not necessarily involve the learners.

2.4.1 Following an experiential learning approach when teaching primary school learners

Experiential learning may lead to a positive outlook on learning (Zimmerman et al., 1998; Leveritt et al., 2013), as this approach to teaching allows learners an opportunity to apply Natural Sciences content to real-life situations (Adams & Hamm, 1998). Such real-life situations can include the germination of their own seeds, creating vegetable gardens and compiling compost heaps. Kolb's (1999) model for an experiential learning cycle thus stands central to this study due to its cyclical nature. Kolb (1999; 2014) suggests that the best way to learn is through practical and concrete experiences, thereby providing the "missing link between theory and practice" (Kolb, 2014: preface). The phases captured in Figure 2.1 provides an overview of Kolb's (2014) cycle of experiential learning.
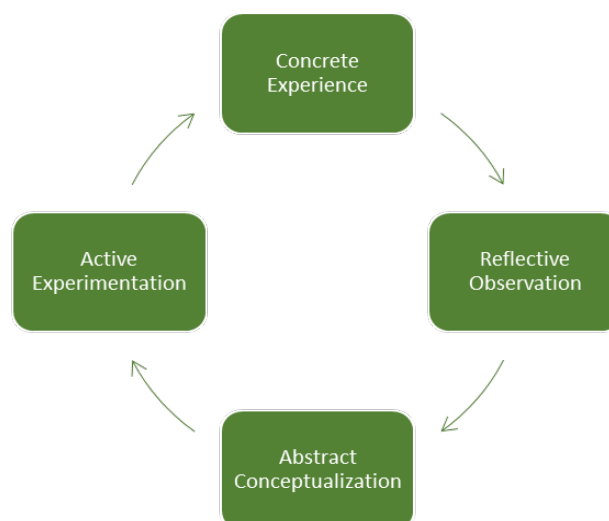
Figure 2.1: Kolb's basic model for experiential learning

The experiential learning phases were included as part of the enriched Natural Sciences curriculum, where learners were taught content, actively experimented by using concrete experiences and then afterwards reflected on the session.

2.4.2 Benefits of following an experiential learning approach

Experiential learning implies student-centred learning and is associated with increased motivation for learning, and active student engagement (Baker, Terry, Bridger & Winsor, 1997; Rowe et al., 2007; Wilson, 2000). Additionally, small group work, class discussions, peer tutoring and cooperative learning activities can enhance the social relationships and the school connectedness of learners (Schaps & Soloman, 1990; Baker et al., 1997; Korinek, Walther-Thomas, McLaughlin & Williams, 1999).

Cooperative learning activities and activities in small groups that consist of heterogeneous learners can furthermore support the educational and psychosocial needs of learners in resource-constrained settings. In addition, learners' attitudes towards other learners and teachers, race relations, learners with disabilities and learners who display emotional disorders can improve (Korinek et al., 1999; Slaven & Oickle, 1981; Sulkowski, 2014).

The benefits of experiential learning, as suggested by Beard and Wilson (2006), relate to learners gaining more real-world experience in the classroom that could more adequately prepare them for the "real world". Experiential learning also requires active engagement and creative problem solving, which may result in learners' better understanding of the content being taught (Kolb, 1999; Beard & Wilson, 2006).

Reflective practices, as part of the experiential learning process, form an integral link between theory and practice (Beard & Wilson, 2006). When reflecting, learners are namely able to analyse what they have learned and what the outcomes are (Kolb & Kolb, 2005). This process allows learners to make meaning

of the content that they learn (Beard & Wilson, 2006; Kolb, 2014). The reflective process furthermore allows learners to evaluate their mistakes, and as a result valuing such mistakes instead of fearing them (Sproule et al., 2005; Beard & Wilson, 2006).

Potter et al. (2015) suggest that experiential learning will result in accelerated learning due to neural links in the brain being strengthened by the activities that are involved, such as problem solving and authentic learning experiences. In addition, Potter et al. (2015) as well as Beard and Wilson (2006) suggest that experiential learning can contribute to positive attitudes about learning, amongst learners.

2.4.3   Role of the facilitator when utilising experiential learning

Deltuva (2010) explains that the position in which facilitators positions themselves when learners are actively working on an activity, is essential in experiential learning. Four facilitator positions are suggested for an experiential learning activity (Deltuva, 2010), which include occupying one of the following positions:

- observer, where the facilitator keeps a distance and observes how the group progresses with the activity,
- confronting, where the facilitator mirrors his or her feelings and concerns about the group,
- coordinator, where the facilitator forms part of the group and coordinates the activities, and
- participant, where the facilitator immerges him- or herself in the group and is at the "same level" as the learners.

Throughout the Win-LIFE intervention, the facilitator migrated between the various positions in order to observe, relate, coordinate and participate in the enriched Natural Sciences curriculum that was presented. Chapman (2013) suggests that the facilitator's role is not merely to teach content, but to develop learners as individuals. This suggests that the facilitator is not solely focused on the content

that he or she needs to teach the learners, but also on their emotional well-being (Chapman, 2013; Kolb, 2014; Deltuva, 2010).

2.5 INTERVENTIONS BY MEANS OF ENRICHED SCHOOL CURRICULA

Existing school curricula can be used as potential channels for interventions that focus on health and well-being (Botha, 2014). In this section, I provide examples of such interventions and background information on the current South African curriculum for Natural Sciences. I also explain how the Win-LIFE intervention aimed to enrich this curriculum.

2.5.1 Examples of curriculum-based interventions

Existing studies (Fuchs, Fuchs, Hamlett, Phillips & Bentz, 1994; Bagnato, Neisworth & Munson, 1997; CDC, 2016; Knai et al*.,* 2005) indicate the possibility of teaching learners healthy habits (such as eating vegetables) by means of structured interventions or by enhancing learners' awareness of how vegetables are planted and grown in order to increase their existing food sources. Schools can thus support learners in improving their health by providing an environment in which learners can learn where food comes from and are taught how to start their own vegetable gardens at home (Story et al., 2009).

Holler et al. (2010) conducted a multi-level, multi-sector, school-based study in collaboration with the Healthier Options for Public Schoolchildren (HOPS) and Organ Wise Guys® (OWG). The study included four intervention schools and one control school. According to Holler et al*.* (2010), this study indicates that learners in the intervention schools' health and well-being programme drastically improved when compared to the control group's members. Another example of one of these multi-sector, school-based collaborations is HealthKick (Abrahams, 2011). Abrahams (2011) suggests that school-based interventions have the ability to improve health and well-being.

Sproule et al. (2005) provide another example. They implemented an enriched curriculum the Early Years Enriched Curriculum Evaluation Project (EYECEP), which focused on enriching the curriculum for the first four years of schooling by

35

following a play- and activity-based approach. Findings of their study indicate that learners' reading and literacy skills can improve when exposed to an enriched curriculum where   experiences related to failure are removed (Sproule et al., 2005). It can therefore be concluded that curriculum-based interventions tend to have a positive effect on learners' scholastic progress.

2.5.2   The South African National Curriculum Policy Statement Natural Sciences and Technology in the intermediate phase

The CAPS for Natural Sciences and Technology specifies three aims that underpin all content taught in this learning area. The three aims, as explained by the Department of Basic Education (2011), are namely that learners should be taught to how to do Natural Sciences and Technology, to understand and be able to connect ideas and to understand the practical uses of Natural Sciences and Technology in society and the environment, thereby acquiring values that may result in them being caring and creative citizens. Furthermore, the Department of Basic Education (2011,p.11) explains the applicability of Sciences and Technology as follows:

> "Natural Sciences and Technology learnt at school should produce learners who understand that school sciences can be relevant to their lives outside of school. Issues such as improving water quality, growing food without damaging the land, and building energy-efficient houses are examples of everyday applications. Similarly, Natural Sciences and Technology can lead learners to a range of career and job possibilities".

CAPS can thus seemingly be used to enhance learners' understanding of food, nutrition and well-being. This curriculum can be seen as one of the two foundations on which the Win-LIFE intervention is based; the school is viewed as an arena in which knowledge and skill transfer can be acted out, which can in turn be transferred to communities.

The Curriculum and Assessment Policy Statement (CAPS) stipulates that the Natural Sciences and Technology learning area for Intermediate Phase Grades 4 to 6 consists of eight themes each year (Appendix A) across two strands (DBE, 2011).This research primarily focuses on the Life and Living theme in the Natural

Sciences curriculum (DBE, 2011), which encapsulates ideas pertaining to plants, animals and food production. For Grade 5 (the focus of my study), the content specifically deals with animals and plants, skeletons of animals, food chains and life cycles (DBE, 2011). Even though not directly related to this study, the content for Grade 6 Natural Sciences that relates to the WIN-Life intervention is photosynthesis, nutrients in food, nutrition, ecosystems and food webs (DBE, 2011). In addition, Grades 4 to 6 Technology that relates to this study involves food processing (DBE, 2011).

According to the Natural Sciences CAPS (DBE, 2011), Natural Sciences' core aim is to prepare learners for economic activity and active participation in a democratic society (DBE, 2011). As such, the Natural Sciences CAPS involves three main outcomes that relate to knowledge, skills and authentic application of newly acquired knowledge and skills (DBE, 2011). In this study, the knowledge, skills and authentic application of new knowledge and skills of Grade 5 learners were explored. The focus fell on the content that is dealt with in the third term, which relates to Life and Living, with a specific focus on plants and the plant life cycle.

The first topic in the Life and Living theme of the Natural Sciences CAPS involves plants and the components thereof, what a plant needs to grow and the different types of soil (DBE, 2011). The second topic for this theme entails the plant life cycle, pollination, fertilisation, the making of compost, germination and the growth of a plant (DBE, 2011). Here, learners are encouraged to take responsibility for their own learning and are required to interact with not only their peers but also with their family and community members, all of which may ultimately lead to the authentic application of their knowledge and skills.

2.5.3 Enriching the Natural Sciences curriculum by means of the Win-LIFE intervention

The Win-LIFE health-promotion intervention enriches the CAPS by employing an activity-based mode of instruction and relying on experiential learning in order to assist with the authentic application of content. In addition, parents are involved in homework activities, thereby enhancing the possibility of knowledge transfer (Botha, 2014). As mentioned, the intervention was designed to specifically cover

the knowledge, skills and application of content included in the Life and Living theme of the Natural Sciences CAPS, in addition to enriching certain themes that are covered in the Life Skills subject (Bentley, 2016).

The manner in which the Grade 5 Natural Sciences CAPS was enriched as part of the Win-LIFE intervention is summarised in Table 2.1.

Table 2.1: Enriching the Grade 5 Natural Sciences curriculum

Study areas in the Natural Sciences curriculum for Life and living	Themes of study areas	Themes included in the Win-LIFE intervention
Topic 1	Plants	Learners had to identify and draw different plants in their surroundings (Win-LIFE Educator's Guide, Lesson 14, pp.79-82)
	Components of a plant	Learners had to label the parts of a plant after drawing different plants in their surroundings (Win-LIFE Educator's Guide, Lesson 15, pp.90-100)
	What a plant needs to grow	Images of what a plant needs to grow. Singing a song to remember what a plant needs to grow (Win-LIFE Educator's Guide, Lesson 12a, pp.43-51)
	Different types of soil	Learners had to go outside and collect different samples of soil. Thereafter the different characteristics of the soil were discussed by observing the soil samples (Win-LIFE Educator's Guide, Lesson 10, pp.27-39)
Topic 2	Plant life cycle	Grade 6 work, but learners watched a video to obtain a basic idea of a plant's life cycle (Win-LIFE Educator's Guide, Lesson 16, pp.103-108)
	Pollination	Grade 6 curriculum, not covered for the purpose of this study (Win-LIFE Educator's Guide, Lesson 16, pp.103-108)
	Fertilisation	Was completed in conjunction with the different types of soil (Win-LIFE Educator's Guide, Lesson 12a, pp. 43-54)
	Compost	Learners watched a video on how to make compost, after which they had to complete an activity where they planned their own compost heap (Win-LIFE Educator's Guide, Lesson 12b, pp.56-59)
	Germination	Learners germinated their own seeds and kept a germination journal to monitor the process and growth of a plant (Win-LIFE Educator's Guide, Lesson 16, pp.62-76)
	Growth of a plant	This theme was integrated throughout all

Study areas in the Natural Sciences curriculum for Life and living	Themes of study areas	Themes included in the Win-LIFE intervention
		the activities and learning opportunities (Win-LIFE Educator's Guide, Lessons 10-17,pp.23-115)

In order to understand Grade 5 learners' experiences after being taught an enriched Natural Sciences curriculum, I next discuss the theoretical framework that guided me. I relied on this framework in planning and undertaking my field work, yet also when interpreting the results in terms of existing theory.

2.6 THEORETICAL FRAMEWORK OF THE STUDY

I relied on Bronfenbrenner's Bio-Ecological model (Bronfenbrenner, 1994, Bronfenbrenner, 2005; Bronfenbrenner & Morris, 2006) as theoretical framework for this study. One of the key principles of this framework that guided me in my research relates to the assumption that change in one part of a system will result in change in other parts of the system (Bronfenbrenner & Crouter, 1983; Bronfenbrenner, 1994). In order to understand human development, one needs to understand the ecological system in which growth occurs (Bronfenbrenner, 1994). This implies that, according to this theory, change in the school system will result in change in the individual and community systems, based on the experiences of individuals. The model presented in Figure 2.2 is based on Bronfenbrenner's Bio-Ecological model (Bronfenbrenner, 1979)[8], but has been adapted to my study.

---

[8] I acknowledge the fact that this is a dated source, yet consulted it as original source on Bio-Ecological model (Bronfenbrenner, 1979).

Figure 2.2: Theoretical framework of the study (adapted from Bronfenbrenner, 1994)

Bronfenbrenner (1994;2005) divides the ecological system into five sub-systems and states that constant reciprocal interaction takes place between the various sub-systems. The first sub-system is the micro-system, which is the system where the developing individual interacts, where patterns of activities take place, social roles are determined and interpersonal interactions occur in specific social, physical and symbolic structures. The micro-system includes all proximal processes that take place in the family, at school and among the peer group of the individual (Bronfenbrenner, 1994; Bronfenbrenner & Crouter, 1983; Bronfenbrenner, 2005; Bronfenbrenner & Morris, 2006). In this study, the micro-system refers to the developing participants' experiences in the school setting that relate to health and well-being, healthy food choices and sustainable living.

The second sub-system is the meso-system, which entails the links between the interactions of a developing individual taking place between different settings, for example the interactions that take place between school and home as well as between the learners during group work (Bronfenbrenner, 1994; Bronfenbrenner & Crouter, 1983; Bronfenbrenner, 2005; Bronfenbrenner & Morris, 2006). The aim of the Win-LIFE intervention was to educate learners, with the possibility of them communicating newly gained knowledge and skills to their home environment, thereby functioning in the meso-system. In this study, the meso-system refers to the interaction between learners and parents when completing homework.

The third sub-system is the exo-system, which comprises the links and processes taking place between two or more settings (Bronfenbrenner, 1994). This involves processes that do not directly, but indirectly, affect developing individuals. As such the exo-system can be seen as the blueprint of a community, culture or sub-culture. All these aspects will impact on a developing individual's micro-system (Bronfenbrenner, 1994). In the resource-constrained community where the broader Win-LIFE project is carried out, the community context can be viewed as the exo-system. In such a resource-constrained community (exo-system), learners can potentially have a ripple effect on upliftment and collaboration by means of innovative thinking as a result of interventions such as the Win-LIFE intervention.

The fourth sub-system is the macro-system, which consists of the overarching pattern of the micro-, meso- and exo-systems characteristic of a given culture or sub-culture (Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2006). Bronfenbrenner (1994) explains that the macro-system relates to belief systems, resources, knowledge of a community and customs. In this study, the macro-system refers to the social values that form part of the Natural Sciences curriculum.

Finally, the fifth sub-system is the chrono-system, which relates to the influence of time on a developing individual (Bronfenbrenner, 1994; Bronfenbrenner & Crouter, 1983; Bronfenbrenner, 2005; Bronfenbrenner & Morris; 2006). In this sub-system, change over time in the environment is noted. The Win-LIFE intervention

attempted to promote change in the Grade 5 learners' environment in order to encourage change over time.

2.7   CONCLUSION

In this chapter I discussed existing literature on the challenges that are generally faced by South African resource-constrained communities as factors that may hamper health and well-being. I explored responses to health-related challenges, and focused on community-based interventions and school-based efforts as examples. Next, I contemplated how enriched school curricula may support learners. I also described how the Win-LIFE health-promotion intervention aimed at enriching the Grade 5 Natural Sciences curriculum, as one example of an intervention-enriching school curricula.

The literature that I consulted steered me in the direction of selecting Bronfenbrenner's Bio-Ecological Model (Bronfenbrenner, 1979) as theoretical framework. The framework informed the manner in which I conducted my research and interpreted the data. As background to Chapters 3 and 4, I explained this framework towards the end of the current chapter.

In the following chapter I describe the empirical study that I undertook. I discuss my epistemological stance, methodological approach and research design. I also explain the procedures I implemented to select the research site and participants, to generate, document and analyse data and to ensure rigour.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

In Chapter 2, I reviewed existing literature on the importance of nutrition and well-being and how the CAPS, schools and teachers can potentially be used to support these aspects in resource-constrained communities. Change can occur when learners are equipped with knowledge, skills and values that can potentially be transferred to their communities. I specifically focused my discussion on how an enriched Natural Sciences CAPS can be used to enhance knowledge and skills that can potentially be applied to the learners' lives. Furthermore, I explained the theoretical framework that guided this investigation, namely Bronfenbrenner's Systems Theory.

In this chapter I discuss the manner in which I undertook the empirical part of my study. I explain the selected paradigmatic perspectives that formed the basis of my research, as well as the research design and methodological strategies for data collection, documentation and analysis. I conclude the chapter by reflecting on my role as researcher and explaining how I followed ethical guidelines and adhered to quality criteria in an attempt to ensure integrity rigour.

3.2 PARADIGMATIC PERSPECTIVES

A paradigmatic perspective represents the manner in which a researcher views a study. It forms an integral part of the meaning-making process during data collection and analysis (Nieuwenhuis, 2010). According to Nieuwenhuis (2010, p. 74), a *paradigm* entails the "set of assumptions or beliefs that determines one's worldview". Maree and Van der Westhuizen (2010) similarly explain that a *paradigmatic perspective* can be described as the manner in which a researcher views the world. This view of the world is usually associated with a set of assumptions that assists the researcher in inferring meaning (Maree & Van der Westhuizen, 2010).

3.2.1   Epistemological paradigm: interpretivism

Morgan and Sklar (2012) regard Interpretivism as a central philosophical tradition that underpins qualitative research. I selected Interpretivism as epistemological paradigm for this study, considering that this paradigm is often effective when involving a smaller number of participants who explain their views and experiences (Cohen et al., 2007). According to Neuman (2006), Interpretivism can assist a researcher in understanding and grasping participants' worldviews in a specific context. Therefore, Interpretivism provided me with a lens through which I viewed the data, the participants and the research (Boas, 1943; Blumer, 1969; Lincoln & Guba, 1985; Woods, 1992; LeCompte & Preissle in Cohen et al. 2007). In line with the Interpretivist paradigm, it was thus important for me to infer meaning by understanding the participants' experiences in their specific context by means of interaction (Terre Blanche, Durrheim & Painter, 2006). As interpretivist researcher, I, as a result, valued the opinions, experiences and inputs of each of the participants (Terre Blanche & Kelly in Durrheim & Wassenaar, 2002). As such, I viewed the participants as individuals functioning in their social worlds with various constructs of reality (Durrheim & Wassenaar, 2002).

This necessitated continued reflexivity. Through reflexivity I remained conscious of my own experiences during this study. Reflexivity thus enabled me to evaluate and reflect on the outcome of the Win-LIFE health-promotion intervention while remaining aware of the potential effect of my own background and interpretations (Creswell, 2013; Hammersley & Atkinson, 1995).

3.2.1.1   Advantages of interpretivism

Radnor (2002) and Neuman (2006) emphasise the advantages of using interpretivism as epistemological paradigm in supporting the notion that this philosophy will allow the researcher to generate data in the participants' natural environment. In viewing and interpreting the participants' experiences and perceptions in their natural setting, rich data can be generated (Denzin & Lincoln, 2005; Patton, 2002; Nieuwenhuis, 2010). In this regard, Merriam (2009) suggests that interpretivist research is unique in the manner in which it allows the

researcher to gain insight into participants' experiences by understanding the process and the knowledge that can be gained from it.

Interpretivist research is usually conducted on a small scale, which implies the challenge of the findings' trustworthiness (Nieuwenhuis, 2010). Lincoln and Guba (1985) explain that in order to increase trustworthiness, criteria such as the dependability and credibility of the data need to be adhered to by means of thick descriptions (Geertz, 1973 in Cohen et al., 2007) and interpretations of the phenomenon. In addition, Creswell (2013) states that qualitative researchers' writing cannot be separated from themselves nor the participants of a study.

Interpretivism furthermore allowed me as researcher to fulfil an active role during the data generation (Chesebro & Borisoff, 2007) and interpretation processes (Radnor, 2002). This active participation and collaboration with the participants allowed for rich data to be generated (Nieuwenhuis, 2010).

3.2.1.2   Challenges associated with interpretivism

Challenges associated with interpretivism include a possible lack of generalisability, the researcher's subjective involvement, questions about rigour and trustworthiness and possible blurred lines with regard to applying ethical guidelines (Mack, 2010, Koch, 1995; Lowenberg, 1993). Keeping these challenges in mind, I remained mindful of the possible pitfalls I could experience during the research process and attempted to address these.

I do not view interpretivist research not allowing for generalisability (Mouton, 2001) as a limitation of the study, based on the purpose of this study, which is to focus on the in-depth exploration and understanding of a specific phenomenon in a specific context. In following a case study design, I set out to gain insight into a specific case, not aiming to obtain generalisable findings. However, the findings of the study may perhaps be transferable to similar settings (Shenton, 2004; Mouton, 2001; Merriam, 1998).

In an attempt to address the other stated challenges I relied on reflexivity, which is regarded as a process that can counteract these challenges (Jackson, Drummond

& Camara, 2007). I reflected with the research team following each intervention session, the PRA-based workshops as well as the member-checking session that I facilitated. I also used a reflective journal for the duration of the research process, documenting my thoughts on my own involvement in the study, possible bias and my position in the research.

After interpreting the generated data, I discussed my findings with the research team in order to ensure that my interpretations represented the generated data (Creswell, 2013). This allowed me to once again reflect on my subjective involvement in the research with peers. In addition, I conducted member-checking in order for the participants to confirm my interpretations.

3.2.2   Methodological approach: qualitative

Both Nieuwenhuis (2007a) and Patton (2002) regard qualitative research as research where a researcher attempts to understand a phenomenon or context by obtaining thick descriptions of people's views and experiences. For this study, I explored Grade 5 learners' experiences after being taught an enriched Natural Sciences curriculum in the context of a primary school in a resourced-constrained community in the Bronkhorstspruit area.

Qualitative research differs from quantitative research in the sense that it does not seek causal relationships, but rather a way to contribute to human understanding of a specific phenomenon or event (Creswell, 2009; Patton, 2002; Nieuwenhuis, 2010). A qualitative approach allowed me to make sense of the experiences of the Grade 5 learners, allowing their voices to be heard with regard to the manner in which they attached meaning to what they experienced.

3.2.2.1   Advantages of qualitative research

According to Houser (2009), qualitative research implies the possibility to understand the phenomenon that is being studied, especially in social interaction settings where a researcher needs to be culturally sensitive (McMillan & Schumacher, 2010; Houser, 2009). By focusing on the participants' views and the

meanings that they attached, a phenomenon can be presented as the participants experienced it.

In following a qualitative approach, I was able to gain different insights into the participants' perceptions, insights and reservations. This approach furthermore enabled me to form a view of the learners' experiences (Houser, 2009; Patton, 2002). By following a qualitative approach I could convey the message that there is no one objective reality and that meaning is created in a specific context in interaction with human beings.

3.2.2.2   Challenges associated with qualitative research

Houser (2009) suggests that the most common challenges associated with qualitative research include researcher bias, a lack of generalisability, credibility as well as the possible lack of consistency in data generation.

Researcher bias was addressed by having collaborative reflection sessions with my supervisor, co-supervisors and co-researcher[9] (Guba & Lincoln, 1989; Houser, 2009). My co-researcher and I also critically reviewed each other's perceptions, experiences and findings (Merriam, 1998; Shenton, 2004).

Considering that generalisability was never the aim of the study, the challenge that relates to a lack of generalisability did not apply. However, the data generation and documentation were conducted in such a manner that it may allow for transferability to similar contexts (Merriam, 1998; Merriam, 2009; Creswell, 2009).

Merriam (1998) and Shenton (2004) suggest that questions related to the credibility of qualitative research can be addressed by ensuring that the findings are consistent with the phenomenon being studied. This congruency was established in this study by using member-checking to ensure that the findings aligned with the participants' experiences (Guba & Lincoln, 1989).

---

[9] In this study the term co-researcher refers to K. Bentley that also conducted a study on the same project, but within the Life Skills subject

The data was generated by using structured instructions, questions, field notes, PRA-workshops and member-checking. The afore-mentioned measures were employed to ensure that the generated data are consistent (Merriam, 1998; Creswell, 2009; Houser, 2009).

3.3 RESEARCH DESIGN

I used a case study design (Stake, 1995; 2000), applying Participatory Reflection and Action (PRA) principles (Whyte, 1991) in attempting to understand the experiences of Grade 5 learners after being taught by means of an enriched curriculum in the Win-LIFE intervention. Stake (1995; 2000) identifies three types of case study designs, namely the intrinsic, instrumental and collective designs. For this study, I implemented an instrumental case study design, aiming to examine a specific case (namely the Grade 5 learners in the Bronkhorstspruit area) in order to provide insight into a specific phenomenon (learners' experiences of an enriched Natural Sciences curriculum) (Stake, 2000).

By applying PRA principles, I was able to use a variety of data generation techniques (Yin, 2009) to gain an in-depth understanding of the participants' experiences in a specific system (Creswell, 1998). Yin (2009) indicates that a case study design is suitable when events are studied that are contemporary, or where the researcher has little or no control over the phenomenon being studied. Stake (1995) elaborates by explaining that a case study design is used when the focus is on learning more about a specific case or situation.

Yin (2009) explains the relevance of a case study design applying PRA principles by stating that such a design can explain causal links in a real-life intervention that may be complex by means of relevant strategies such as surveys or experimental strategies. In applying PRA principles, I assumed that the participants possessed the necessary knowledge and that they could engage with me in order to gain insight into the identified problem (Meriam, 1998). In my research, I thus listened, observed, examined and questioned the participants in order to gain insight into their experiences.

Baxter and Jack (2008) regard case study designs as valuable ways to evaluate programmes and develop interventions. Yin (2003) explains that the advantages of employing a case study design by applying PRA principles relate to the researcher being able to explore individuals or organisations and to gain insight into a specific subject area (Stake, 2000; Silverman, 2013). This design allows the researcher to follow a flexible approach (Yin, 2003, Patton, 2002). Baxter (2006) furthermore notes that a case study design applying PRA principles will not only allow the researcher to gain insight into the participants' experiences, but also into the research context and what this implies.

Despite the benefits of a case study design applying PRA principles, this choice also implied certain potential challenges, including a potentially low degree of control and limited generalisability (Mouton, 2001; Babbie & Mouton, 2010; Silverman, 2013). However, since I selected Interpretivism as epistemological paradigm, my aim was not to obtain generalisable findings. I rather attempted to describe a particular case in depth in order to gain an understanding of the phenomenon. To me, the application of PRA principles may, as a secondary outcome, subsequently facilitate social change on a small scale (in one particular community) that could be meaningful to the people involved.

Nieuwenhuis (2010) notes that another challenge of participatory action research (or applying PRA principles in this case) and a case study design (Yin, 2009; Babbie & Mouton, 2010) relates to the possible over-involvement of the researcher, which can negatively impact on the research process as well as on the findings of a study. Reflection with my supervisors and co-researchers formed an integral part of my study in an attempt to ensure that I do not become overly involved with the participants or in the research process (Cohen, Manion & Morrison, 2000). In addition, I included member-checking in an attempt to ensure that my analysis was not driven by my own perceptions, in support of the rigour of the study (Yin, 2009).

3.4 METHODOLOGICAL PROCEDURES

In this section I discuss the research process. I explain selection of the case and participants, as well as the data generation, documentation and analysis strategies I implemented. Figure 3.1 depicts a synopsis of the methodological process.
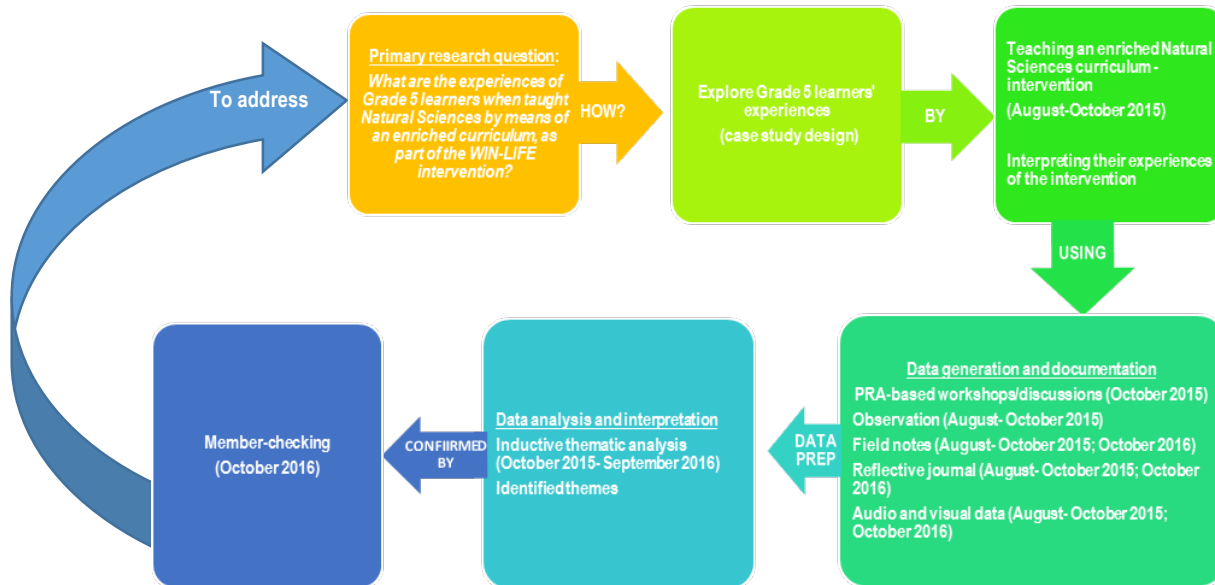
Figure 3.1: Synopsis of methodological process

3.4.1 Selection of case and research participants

Thirty learners participated in this study, selected from one of the three schools that formed part of the Win-LIFE project. Convenience sampling as participant selection strategy is employed when participants, who are easily accessible and convenient to include, are selected (Patton, 2002). Even though I relied on convenience sampling in selecting the participants from the specific school where the intervention was implemented. I also relied on purposeful sampling to select the participants. Purposeful sampling is most suitable for exploratory research, where the researcher implements certain criteria, in order to address the research objectives of the study (Neuman, 2006; De Vos et al., 2005; Palys, 2008; Nieuwenhuis, 2010).

The selection criteria that applied, are that:

- participants had to be Grade 5 learners in the participating school in the Bronkhorstspruit area;

- participants must have been taught Natural Science by means of the Win-LIFE enriched curriculum during the initial implementation in 2014;

- participants had to be able to communicate in English;

- participants had to provide informed assent and their parents/caregivers informed consent for their participation; and

- participants had to be available after school hours.

3.4.2 Data generation and documentation

A hallmark quality of a case study design applying PRA principles is the use of multiple data generation and documentation strategies that can enhance the credibility of the study (Patton, 1990; Yin, 2003). I used PRA-based workshops/discussions, observation, field notes, visual data documentation techniques and a research journal to generate and document data. The participants also each had a reflective journal in which they noted what they had learned following each session of implementation of the enriched Natural Sciences curriculum.

3.4.2.1 PRA-based workshops

Following the implementation of the enriched Natural Sciences curriculum with the Grade 5 learners, I co-facilitated two PRA-based workshops to explore the participants' experiences. PRA-based workshops were thus used to gain insight into the participants' views and acquired knowledge, skills and attitudes after being taught an enriched curriculum. Jernigan and Jacob (2015) highlight the value of using PRA-based workshops in resource-constrained communities by emphasising the opportunities that it may create in a community between participants and others. A few terms often used in relation to PRA include action learning, team learning, reflective learning and action research (Whyte, 1989; Pedler, 1991; McNamara, 1996; Jarvis, 2000).

The PRA-based workshops were conducted in such a manner that it promoted participation by using interactive activities, which, in turn, motivated the participants to partake in these activities. These interactive activities were structured in such a manner that I could gain insight into what the participants had enjoyed, what they would have liked to change and what they had learned. The workshops furthermore assisted me in gaining insight into the experiences of multiple participants after being taught an enriched Natural Sciences curriculum.

The PRA-based workshops with the learners each lasted two hours and were conducted in October 2015. As indicated, the workshops were activity-based and involved learners working together in groups of four to six for a few activities and then reporting back to the bigger group after each small-group discussion. I audio-recorded all reports for data documentation and analysis purposes.

The first PRA-based workshop focused on the themes of gardening equipment, where to start a vegetable garden, different types of soil and how to make compost. Learners had to identify the gardening equipment that they would require when wanting to start a vegetable garden (Photograph 3.1). Next they had to evaluate various options in order to determine where the most appropriate place will be to start a vegetable garden (Photograph 3.2). They also had to decide on the best type of soil for their vegetable garden and what they would use to make their own compost. During this workshop, I thus attempted to explore what learners had retained following the intervention, by guiding them to reflect on their learning and report back on this.

| **Photograph 3.1: PRA-poster by Group 3 on** | **Photograph 3.2: PRA-poster by Group 3 on selecting the most suitable spot for a vegetable** |
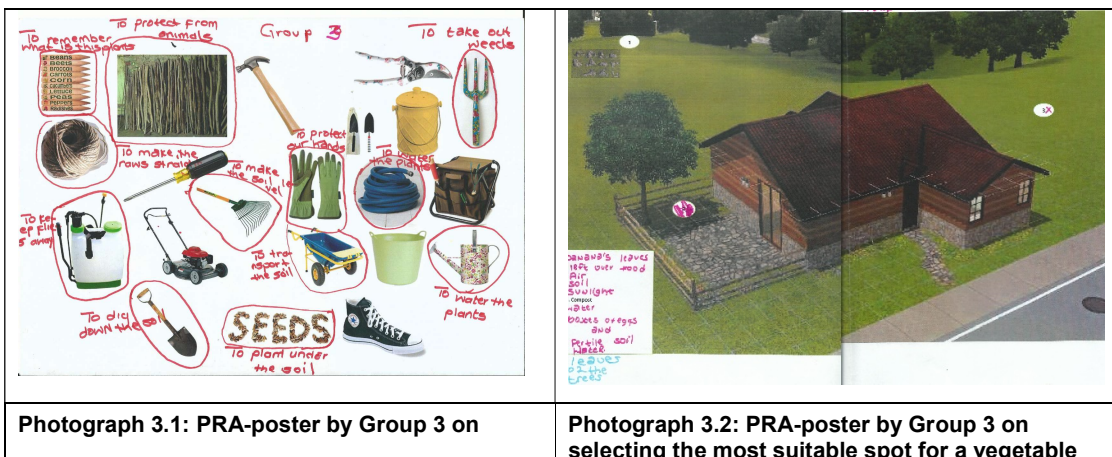
selecting gardening equipment	garden

Learners furthermore had to answer specific questions on an answersheet to motivate their choices. Photograph 3.3 captures the manner in which the learners of Group 1 answered some of these the questions. All posters made and activities in which learners participated were captured by means of photographs, which are included as Appendix I.
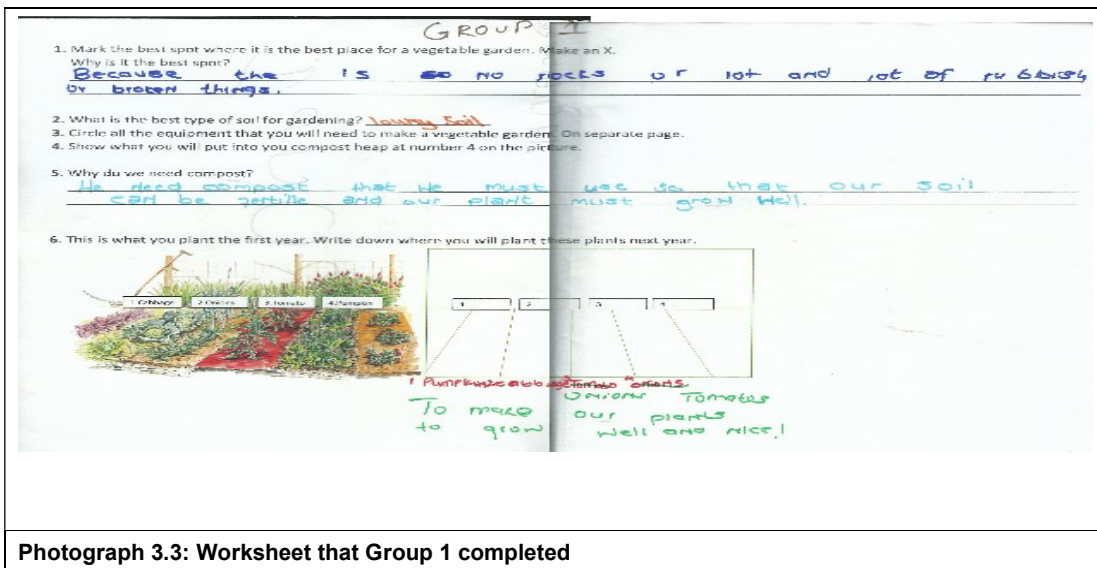
Photograph 3.3: Worksheet that Group 1 completed

During the second PRA-based workshop (three days later), learners again worked in their groups; yet, in this workshop, a little more focus was placed on individual learners' experiences. Learners identified the different parts of a plant (Photograph 3.4), demonstrated how to plant a seed (Photograph 3.5) and explained this process to the larger group.

Photograph 3.4: Labelling the different parts of a plant (Group 2)	Photograph 3.5: Demonstrating how to plant a seed (Group 1)
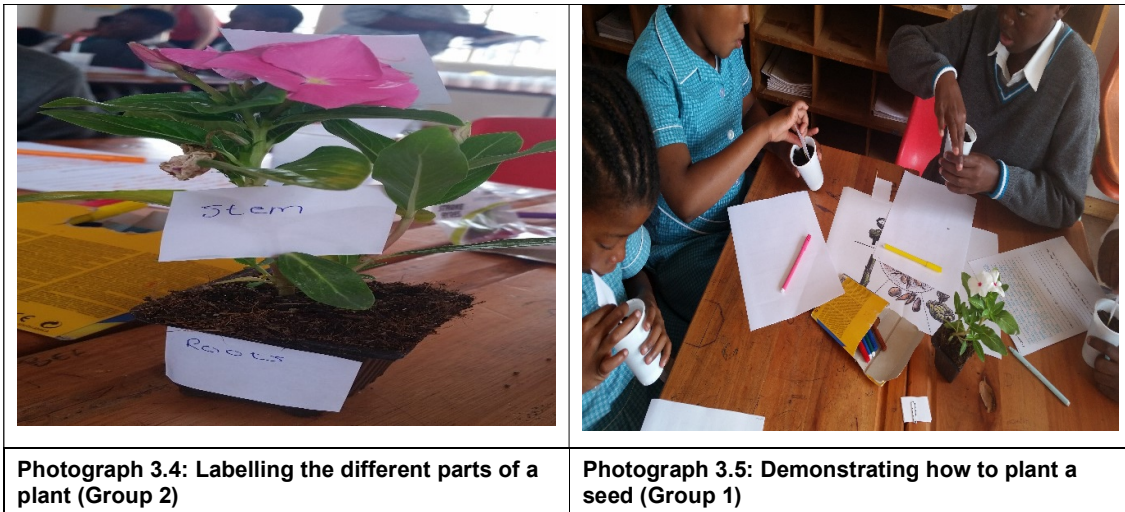
The workshop was concluded with a reflection activity during which each of the learners had to reflect by answering the following questions in writing (within their small groups):

- what did you learn;
- what did you enjoy;
- who has a vegetable garden at home;
- did you tell your parents about vegetable gardens; and
- what did you tell your parents?

These questions guided the learners in reflecting on their learning and assisted me in generating data about their experiences during and following the implementation of the Win-LIFE project. By selecting PRA-based workshops, I however also experienced some challenges, namely planning and structuring the activities in such a way that it was clear and address all the relevant topics (Newman, 2001). I addressed this issue by planning the sessions with my supervisor and co-supervisors, which also address the challenge of involving the various role players (Whyte, 1999; Newman, 2001). Hickey and Mohan (2004) suggest that the conceptualisation of a community is often based on a unitary concept that does not consider differences such as gender or age. I considered the complexity of this research community throughout the study relying on existing research on resource-constrained communities and maintaining a holistic view (Thompson, 2004).

3.4.2.2 Observation

During observation, a researcher can generate data by looking and listening to participants in the field (Patton, 2002; Flick, 2009). Observation is regarded as a unique data generation method, as it allows the researcher to observe and interact with participants in their natural setting while generating data (DeWalt & DeWalt, 2002). Welman, Kruger and Mitchell (2005) similarly explain that when a researcher observes participants in their natural settings, their behaviour can be viewed directly, thereby providing first-hand data that is generated.

Patton (2002) elaborates on this explanation by stating that observations focus on participants' behaviour, the activities they are busy with, interpersonal interactions and organisational processes. As this study aimed to explore the learners' experiences of an enriched curriculum, forming part of an intervention, I observed their behaviour during the implementation and data generation phases, as well as how they interacted with their peers. I also noted their participation and engagement in the learning process.

Throughout, I documented my observations in the form of field notes and captured them by means of photographs. Mulhall (2003), similar to Patton (2002), in this regard explains that observations often include the recording of participants' responses and their behaviour, and are typically captured and documented by means of field notes.

In terms of potential challenges associated with observation as data generation technique, Yin (2003) notes that observation may be experienced as intrusive and can result in reactions that may not be authentic. In this study, the learners seemed comfortable with my presence during the intervention as well as during the PRA-based workshops and member-checking sessions. My presence did not seem to have an intrusive effect on the learners, possibly due to the sound rapport that I established with the learners. At the time of the PRA-based data generation workshops, the learners were also used to the research team observing them and taking pictures of their contributions and participation.

3.4.2.3   Field notes

Field notes are informal documents that capture what a researcher hears, sees and feels (Mouton, 2001). Field notes are a valuable data source in qualitative and participatory studies and can be used at any stage of the research process (Bell, 2005). Throughout the implementation of the enriched curriculum (August to September 2015), the PRA-based workshops (October 2015) and during member-checking (October 2016), my co-researchers and I made field notes. This process allowed for multiple people documenting the process and field experiences, thereby allowing for crystallisation (Silverman, 2013) and generating data rich in meaning and representative of the case being studied (Terre Blanche & Durrheim, 2002).

According to Rossman and Rallis (2003), field notes will consist of a researcher's observations and comments on observations. Merriam (1998), as well as Rosman and Rallis (2003), explain that field notes usually include descriptions of the context, the participants, activities, observer comments and remarks made by participants.

Silverman (2013) highlights two prominent challenges that are associated with field notes, namely the subjective nature thereof and the challenge of effectively documenting what happens in the field (Merriam, 1998). Merriam (1998) suggests the joint collection and analysis of data as a possible way of addressing these challenges. In this regard, the fact that my co-supervisor and co-researcher compiled the field notes enabled me to guard against the said challenges. In addition, I relied on continuous reflection, focusing on my own background and the potential effect of bias, and guarding against subjective views and interpretations. I also compiled my notes during and directly after the data generation sessions.

3.4.2.4   Reflective journal

A reflective journal can be regarded as a subjective document by means of which the researcher can do introspection and make sense of the research being conducted (Flick, 2009). According to Morley-Warner (2000), a reflective journal

maps out the researcher's journey of engaging and learning during the research process.

Reflection formed an integral part of my research journey, as I was able to think about what I had experienced when reflecting. Reflection furthermore formed part of the research team's conversation to and from the participating school during each school visit. My co-researcher and I would discuss each session in this way and reflect on what had been successful, what could be improved on and what the value of the specific session would potentially be.

In terms of the format of reflections, James, Milenkiewicz and Bucknam (2008) suggest that a reflective journal captures subjective descriptions of the researcher's experience, albeit in written or spoken form. A reflective journal thus provided me with a platform to critically reflect on the process, my own biases, areas of growth, possible trends and insights. I relied on both spoken (with the research team) and written modes (throughout the study on my own).

In addition to my reflective journal, the participants each reflected on their experiences in a journal, which I also included as data source. By allowing the participants to reflect after each session I was able to gain insight into the participants' experiences (Flick, 2009) after being taught an enriched Natural Sciences curriculum. The participants' reflections thus supplemented and supported my own reflective process.

3.4.2.5   Audio and visual data collection and documentation strategies

I collected visual data in the form of photographs and PRA-posters. I also used a voice recorder to record the participants' responses during the PRA-based workshops, with the intention to later transcribe these verbatim for data analysis purposes (Bell, 2010).

Schwartz (1989) explains that photographs as data source imply the advantage of generating a myriad of meanings in a research process. Banks (2000) similarly highlights the fact that photographs can capture a research process and evoke connections with and between participants that are then captured in the image.

The use of photographs allowed me to critically reflect on the research process and to get a glimpse of the participants' experiences during the research process.

The participants created PRA-posters during the PRA-based workshops, which also provided visual data. The PRA-posters allowed the participants to visually communicate their knowledge, skills and experiences. These posters therefore provide useful visual representations (Banks, 2000) of what the participants discussed and how this relates to the research process and phases.

As already indicated, I made audio-recordings of the participants' feedback during PRA-based workshops and intended to transcribe these in order to gain insight into the participants' verbatim accounts of their experiences (Jewitt, 2012). However, the recordings were corrupted, resulting in me not being able to use the transcriptions. Because of this, I had to focus on visual data, field notes and reflective journals.

Bell (2010) and Jewitt (2012) both agree that even though audio-recordings can provide the researcher with additional insight, this strategy also has its challenges, such as that it is time-consuming to transcribe, that technical difficulties may hamper the effectiveness of recordings and that the use of a recording device can be intrusive. Bell (2010) explains that a voice recorder may even prevent participants from effectively engaging, seeing that they may feel exposed or shy when being recorded. Jewitt (2012) furthermore suggests that the transcriptions of audio recordings can potentially lead to a vast amount of data that needs to be analysed.

3.4.3   Data analysis and interpretation

In qualitative research, data generation, documentation and analysis occur concurrently (Baxter & Jack, 2008). Activity-based workshops allowed me to generate data and immediately start analysing the data when participants reported back; I could also observe trends and repetitive ideas across the groups. I relied on thematic inductive content analysis for this study.

Braun and Clarke (2006), as well as Nieuwenhuis (2010), emphasise that in order for inductive thematic analysis to be trustworthy, researchers need to be rigorous and submerge themselves in the analysis process (Creswell, 2013). I dedicated myself to ensuring that the data I documented are trustworthy and representative of the learners' experiences. I relied on various data sources for this purpose.

Braun and Clarke (2006) are of the opinion that thematic analysis cannot be approached in a fixed way, but that it is open for interpretation when following some general steps or guidelines. This freedom allowed me to move in the direction that the data took me instead of following a specific fixed set of rules. However, I relied on Braun and Clarke's (2006) six-phase guide to thematic analysis, against the background of Miles and Huberman's (1994) phases of qualitative analysis.

As such, I started by ensuring that all data were documented in a format that could be analysed. Next, I critically read through all the field notes, observations and transcripts of posters and viewed all visual data while starting to identify broad themes. Once the data were preliminary sorted into broad themes, I critically read through the data again and started identifying more specific themes and codes (Guest & McLellan, 2003). As soon as I was satisfied with the grouping of the themes and codes, I reflected with my co-researcher in order for her to confirm my initial analysis. Thereafter, I discussed my analysis with my supervisors and revised some of the themes and subthemes based on these discussions.

Vaismoradi, Turunen and Bonda (2013) suggest that the use of more than one coder and inclusion of a reflective journal can increase the rigour of a study and the completed analysis. I employed these strategies during this study, thereby potentially enhancing the rigour and trustworthiness of the results I obtained. Appendices, F, G, H, I and J include examples of the data analysis I completed, representing my analysis of the various sources of transcriptions, visual data, reflective journals, field notes and PRA-based documents. In working inductively, I allowed the themes to emerge from the collected data, reading through the various data sources various times and attempting to identify recurring themes and sub-

themes. I used mind maps to illustrate the themes and sub-themes and opted not to rely on electronic software for this purpose.

3.4.3.1 Advantages of using inductive thematic analysis for this study

As qualitative researcher, it was important for me to analyse the data in a way that I could deduce what the participants were trying to convey. Alhojailan (2012) explains that participants are the experts in terms of their own behaviour, opinions and attitudes, which may be brought to the fore by means of thematic analysis (Hatch, 2002; Creswell, 2003; Braun & Clarke, 2006). This data analysis technique thus enabled me to understand and report on the Grade 5 learners' experiences after being taught an enriched Natural Science curriculum, by allowing the themes to emerge from the collected data (Creswell, 2013).

Alhojailan (2012) notes that thematic analysis is especially appropriate when a researcher wishes to determine the experiences or current behaviour of participants. As such, I regard thematic analysis as suitable for this study, considering that it allowed me as researcher to gain insight into the participants' experiences, analysing their own accounts of their perceptions.

3.4.3.2 Addressing potential challenges of inductive thematic analysis in this study

Hosmer (2008) notes that one of the associated challenges of inductive analysis relates to criticism in terms of validity and reliability, or for the sake of qualitative research, the trustworthiness of the findings. I attempted to address this potential challenge by involving additional people to check my analysis, namely my co-researcher and supervisors. I also employed member-checking (Nieuwenhuis, 2010) in order for the participants to confirm or elaborate on the initial analysis I completed and the themes I identified. Even though the perception is often held that "anything goes" with inductive thematic analysis (Antaki, Billig, Edwards & Potter, 2002), during this study I relied on Braun and Clarke's (2006) guidelines to guard against this challenge.

Another potential challenge of thematic analysis relates to the possibility of researcher bias (Nieuwenhuis, 2010). To this end, I constantly reviewed the

identified codes and themes with my co-researcher and supervisors, striving towards trustworthiness. Furthermore, I found inductive thematic analysis to be rather time-consuming based on the extent of the raw data involved (Jewitt, 2012). Even though the process was time-consuming, this process of data analysis allowed me to gain insight into the learners' experiences rather than assigning my own preconceived themes or ideas to what they had indicated.

3.5   REFLECTING ON MY ROLE AS QUALITATIVE RESEARCHER

Throughout this study, I fulfilled various roles. As a researcher I took on the role of participant-observer (Maree, 2010). I was actively engaged in the research process and compiled field notes throughout the intervention and data generation sessions (Denzin & Lincoln, 2000). As observer, I observed the interaction among learners, learner participation and engagement during group work. I also fulfilled the role of co-facilitator of the Win-LIFE intervention by being supportive during the intervention sessions and PR-based workshops of my co-researcher, where I took field notes and assisted where needed. During these sessions I focused on creating a warm inviting environment that would be conducive to positive learning experiences (Deltuva, 2010).

As a facilitator I had to find the balance between teaching and facilitating, by maintaining boundaries and allowing learners to express themselves within these boundaries (Chapman, 2013; Kolb, 2014). This was a role that came naturally to me, where I could facilitate and maintain a conducive learning environment where learners actively participate. However, the role of interpreter and writer was very challenging to adopt (Braun & Clarke, 2006).

After the intervention, I took on the role of interpreter by interpreting and analysing the generated data by means of inductive analysis, where I allowed the themes to emerge from the generated data. As part of being an interpreter, I my role became instrumental in understanding and interpreting the multiple voices of the learners captured within the generated data (Staunæs & Søndergaard, 2008). I also had to draw preliminary conclusions and findings. These initial conclusions and findings had to be confirmed by the learners during the member-checking session (Merriam, 1998; Merriam, 2009).

Thereafter I took on the role of writer, by writing up the existing literature that relates to my study; unpacking the methodology and research design; writing about the findings of the study and making recommendations for future research, training and practice (Creswell, 2002; Merriam, 2009). Throughout the research process, I fulfilled the role of student in educational psychology (yet as researcher), since I constantly had to learn and familiarise myself with the literature and content relevant to this study. In enjoyed taking on the role of student, because I was constantly learning throughout the intervention.

Lastly I reflected on my role as participant-observer, co-facilitator, co-researcher, facilitator, interpreter, writer and student. Fulfilling this role, I reflected by means of a reflective journal and peer debriefing (Staunæs & Søndergaard, 2008; Merriam, 2009; Creswell, 2013).

3.6   ETHICAL GUIDELINES

This study formed part of the Win-LIFE project that obtained ethical clearance from the Gauteng Department of Basic Education (Appendix A) and the relevant school (Appendix A). The learners' Informed assent and their parents/caregivers' consent were also obtained prior to any data generation activities (Appendix B). Throughout I was guided by the ethical guidelines of the University of Pretoria's Faculty of Education (Ethics Committee, 2015). I treated participants with respect at all times, especially with regard to cultural and religious differences between the participants and myself (Suzuki et al.,2005; Flick, 2009), and attended to the principles of confidentiality, anonymity, trust and protection from harm.

The Gauteng Department of Basic Education's ethical guidelines stipulate that research may not be conducted during the first or fourth school terms. Due to this guideline, member-checking could only be conducted in the year following data generation, in the third term when it suited the participating school. However, the member-checking yielded valuable insight into the Grade 5 learners' experiences after being taught an enriched Natural Sciences curriculum and the knowledge and skills they were able to retain.

3.6.1 Voluntary participation and informed consent/assent

Creswell (2003) emphasises the importance of obtaining the required permission and clearance before conducting research in respect of the ethical standards for research. Permission to conduct this study was provided by the University of Pretoria's Ethics Committee (Ethics Committee, 2015), the Gauteng Department of Basic Education and the participating schools. Before I commenced data generation activities, letters of informed consent were sent to parents and informed assent was obtained also from the child participants. Informed consent and assent letters explained the research process and activities to the participants and emphasised that they would be allowed to discontinue their participation whenever they wished to do so (Maree, 2010; Creswell, 2002; Nieuwenhuis, 2010).

3.6.2 Confidentiality, anonymity and respect for privacy

Confidentiality and anonymity, were also discussed with the participants and ensured by using participant numbers (Creswell, 2002) in order to protect their identities. All recorded and written data have been dealt with confidentially, thereby ensuring the participants' anonymity.

3.6.3 Trust and respect

Trust formed an integral part of my study in that I ensured that the participants were informed about the research process and what to expect (Denzin & Lincoln, 2000; Neuman, 2006). Throughout the research process, the participants were informed about the aim of the study and what was expected of them. As such, participants and their parents were informed about what the research project involved by providing them with information as part of the informed consent/assent process. Participants were also aware of their voluntary participation and that they could withdraw from the research at any time (Ethics Committee, 2015). Throughout the study I aimed to communicate my intentions, that in turn could have resulted in mutual respect (Mouton, 2001).

3.6.4 Protection from harm

Protection from harm can be seen as the notion to protect participants from any physical or emotional harm (Glesne, 1999; Patton, 2002). Throughout the research process I evaluated possible risks that might harm the participants (Creswell, 2000), but could not identify any significant risks. Participants were protected from harm (emotional or physical). This research was situated in the broader Win-LIFE project, and its ethical guidelines formed the parameters in which I functioned at all times.

3.7 QUALITY CRITERIA

For this study, it was important to obtain rich descriptions that would portray a "slice of life" (Merriam, 2009; Nieuwenhuis, 2010) in order to adhere to the qualitative research criteria for rigour. These criteria are credibility, transferability, dependability, confirmability and authenticity (Mertens, 1998; Patton, 2002).

3.7.1 Credibility

Credibility in qualitative research can be viewed as the relationship between the manner in which a researcher portrays the viewpoints of participants and the actual viewpoints of the participants (Patton, 2002; Silverman, 2013; Fick, 2009). In an attempt to do credible research, I applied intellectual rigour (Creswell, 2002), worked with integrity and implemented specified methodological strategies (Mertens, 1998). Multiple data sources were used to enhance the credibility of the study (Creswell, 2013). The sources include reflective journals, homework activities, field notes, posters, photographs and member-checking activity (Merriam, 1998; Merriam, 2009).

Participants' responses are, for example, included in the form of verbatim excerpts from the data in Chapter 4 in order to support credibility (Flick, 2009). I furthermore remained cautious of my own bias and the potential effect of subjective interpretations, and continually reflected on this in order to avoid such influences. I furthermore relied on peer debriefing where I reflected with the research team, to debrief after every intervention session and to check my initial data analysis

(Merriam, 2009, Creswell, 2013). I also included member-checking as strategy where learners could affirm my findings (Merriam, 1998; Patton, 2002).

3.7.2   Transferability

Transferability aims to make connections between aspects of a study that could possibly be transferred to similar situations (Barnes et al., 2012). This is usually possible when a study provides "rich thick descriptions" (Seale, 1999; Nieuwenhuis, 2010; Barnes et al., 2012) and the findings of the study could possibly be applied to other contexts beyond the current study. Transferability is not intended to make broad claims (Seale, 1999; Barnes et al., 2012) such as generalisability.

In order to allow for transferability, I include extensive descriptions and interpretations of the data in Chapter 4 as well as in the field notes, reflective journals, visual data and transcripts of PRA-documents included in the appendices. This may provide the reader with ample information in order for the researcher to apply the findings of this study to other contexts, resulting in transferability (Seale, 1999; Creswell, 2000; Patton, 2002).

3.7.3   Dependability

Dependability is regarded as research that can be viewed as logical, observable and well documented (Guba & Lincoln, 1981; Lincoln & Guba, 1985; Erlandson, 1993; Nelson, 1998; Stringer, 2004). In other words, dependability represents the extent to which research can be retraced to participants and their experiences and be reproduced in a similar setting (Stringer, 2004).

Throughout this dissertation of limited scope, I attempted to provide a detailed account of the research process, activities and findings I obtained. For this purpose, I used a reflective journal as well as photographs (Banks, 2001) and field notes (Nieuwenhuis, 2010). I included a trail of evidence in the appendices, as well as the chapters in which I highlight the participants' contributions and reports. These strategies supported my attempts to ensure the dependability of the study.

3.7.4   Confirmability

Confirmability is regarded as the extent to which a study's findings can be verified (Marshall & Rossman, 1999) and are not seen as fabricated to serve a specific purpose (Mouton, 2001). It is also regarded as the extent to which the findings of a study can be confirmed by participants as their views and contributtions (Patton, 2002; Shenton, 2004).

Shenton (2004) suggests various strategies that may be utilised to ensure the confirmability. These strategies include that the researcher remain mindful of possible biases (Silverman, 2001; Shenton, 2004), provide clear explanations of and rationale for the methodological choices (Patton, 2002) and double-checking of findings with the research team and participants (Merriam, 2009). To this end, I relied on strategies such as field notes, discussing my study and the results with my co-researcher and supervisors, including member-checking, providing clear explanations for my methodological choices, and employing reflexive strategies (Mouton, 2001; Nieuwenhuis, 2010; Creswell, 2013).

3.7.5   Authenticity

Authenticity is concerned with hearing the participants' voices (James & Busher, 2006; Denzin & Lincoln, 2000). Mertens (2005) explains that authenticity can be grouped into three types, namely fairness, ontological authenticity and catalytic authenticity. Fairness relates to the extent to which a researcher values the contributions, perceptions, conflicts and differences indicated by a study (Mertens, 2005; Patton, 2002). Ontological authenticity is regarded as the conscious experiences of participants and how these progress throughout the study, whereas catalytic authenticity is regarded as stimulating action by means of the research process (Mertens, 2005).

In this research, I attempted to recount the experiences of the Grade 5 learner-participants by allowing them to reflect on their experiences throughout the intervention. Field notes and reflective journaling were applied to position myself in the research. Once the generated data were analysed, I conducted a member-

checking session in order to verify my interpretations and preliminary findings (Merriam, 2009).

3.8 CONCLUSION

In this chapter, I described the research process of the study. Following a qualitative research approach and relying on interpretivism, allowed me to gain an understanding of the participants' experiences. Inductive content analysis supported me in gaining insight into this case. I also explained the data generation and documentation strategies and stipulated my attempts to ensure rigour by conducting ethical research.

In Chapter 4 I present the results of the study. I structure my discussion in terms of the identified themes and sub-themes, and then interpret these in the second part of the chapter against the background literature I discussed in Chapter 2.

CHAPTER 4

RESULTS AND FINDINGS OF THE STUDY

4.1   INTRODUCTION

In Chapter 3 I discussed the research process and methodology of the study. I explained the manner in which I used the interpretivist paradigm and followed a qualitative approach. I explicated that I implemented a case study research design by applying PRA principles. I also discussed the data generation, documentation and analysis strategies on which I relied and reflected on my role as researcher and my effort to ensure an ethical research and the trustworthiness of the study.

In this chapter I present the results of the study in terms of the three main themes and associated subthemes that I identified by performing inductive thematic analysis. Throughout my discussion I include extracts from the data as supportive evidence. I then present the findings of the study by linking the results I obtained to relevant existing literature, as included in Chapter 2. In Chapter 5, I rely on the findings of the study to come to conclusions when I address the research questions.

4.2   RESULTS OF THE STUDY

In this section, I discuss the three main themes and associated subthemes that I identified. Figure 4.1 provides an overview.
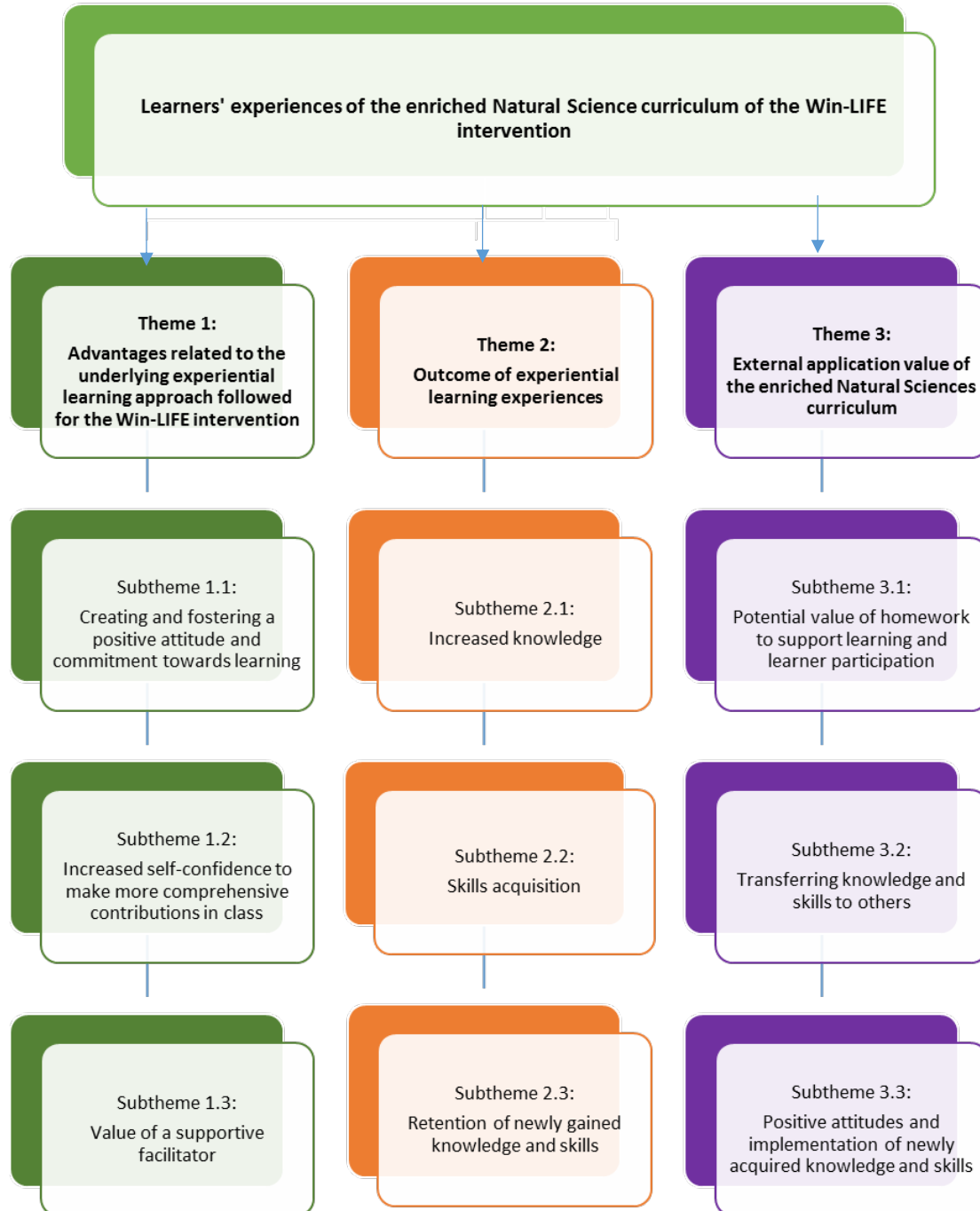
Figure 4.1: Themes and subthemes

4.2.1 Theme 1: Advantages related to the experiential learning approach followed for the Win-LIFE intervention

This theme captures the learners' experiences of the underlying approach followed when implementing the Win-LIFE intervention in the enriched Natural Sciences curriculum. Three subthemes were identified that relate to the creation and fostering of a positive attitude and commitment towards learning, increased self-confidence to contribute more comprehensively, and the value of a supportive facilitator.Table 4.1 provides an overview of the criteria I used to identify the relevant subthemes.

Table 4.1: Inclusion and exclusion criteria for Theme 1

Theme/subtheme	Inclusion criteria	Exclusion criteria
Theme 1: Advantages related to the experiential learning approach followed for the Win-LIFE intervention	Data that relate to learners' positive experiences of the experiential learning approach followed when implementing the Win-LIFE intervention	Data that relate to positive experiences that cannot be attributed to the experiential learning approach followed during the Win-LIFE intervention
Subtheme 1.1: Creating and fostering a positive attitude and commitment towards learning	All data that relate to the fostering of a positive attitude and learner commitment towards learning	Any data that relate to learners' self-confidence, the extent of contributions in class or their reactions to a supportive facilitation approach
Subtheme 1.2: Increased self-confidence to contribute more comprehensively in class	Data that relate to learners' confidence to contribute, to write down their ideas and to actively participate in class	Data that relate to learners' positive attitude and commitment to learn or to their experiences of supportive facilitators
Subtheme 1.3: Value of a supportive facilitator	All data that relate to the effect of supportive facilitators during intervention with learners	Any data that relate to learners' positive attitudes towards learning or their levels of contribution in class

4.2.1.1 Subtheme 1.1: Creating and fostering a positive attitude and commitment towards learning

As part of the underlying principles of the Win-LIFE intervention, learners were actively involved in the learning process. Learners seemingly enjoyed this approach and subsequently displayed a positive attitude towards the learning process, more specifically in relation to activities that involved practical experiences and skills. Their positive experiences are captured in responses such as: *"I enjoyed when we went out and picked soils loamy soil, clay and sand soil"* (PRA2[10], RA, p. 1, G2); *"I enjoyed when they tell us to plant a seed. Ke ratile ge va re botsa ka ga seemywa (I loved when they asked us about planting seeds)"* (PRA2, RA, p16, G1); and *"I enjoy to learn how to plant"* (PRA2, RA, p. 15, G6).

In reflecting on my observations of the learners' active involvement and practical exposure to the learning content, I similarly noted the following after the lesson on different soil types: *"Learners truly enjoyed the practical experience. I could see their faces light up when they experienced touching the soil and seeing the difference in texture"* (RA, 16 September 2015, lines 23-25). The learners confirmed the joy they experienced from being taught while actively participating in activities. They said: *"I enjoy about doing activities"* (PRA2, reflective activity p. 21, G4); and *"I enjoy learning about planning a vegetable garden"* (PRA2, reflective activity p. 23, G4). During learning activities, the learners' active engagement in itself provided evidence of their positive experiences and motivation to be involved in their own learning. Photographs 4.1 and 4.2 provide supportive evidence, indicating the learners' active participation in class and sharing with their peers.

---

[10] The following abbreviations apply to this chapter: PRA1 = First PRA-workshop; PRA2 = Second PRA- workshop;

RA = Reflective activity; P = Participant, G = Group; FN = Field notes; CR = Co-researcher;

CS = Co-supervisor; RJ = Reflective journal; MC = Member-checking

| Photograph 4.1: Learners actively working together to label the parts of a plant (PRA2) | Photograph 4.2: Learners working together in their groups, to identify the parts of a plant that can be eaten (PRA2) |

In support of the visual data, the learners' active involvement was also captured by my co-researcher in her field notes. She wrote: *"All learners actively participate. They label their plants and cover their seeds"* (FN12CR, 22 October 2015, line 383). Responses such as these seemingly point to the value of learner involvement in the learning process, creating positive experiences on their side. This idea was confirmed during member-checking, when one of the learners said: *"This was more fun than school"* (FNCS, 31 October 2016).

Group work formed an integral part of the intervention, as illustrated in Photographs 4.1 and 4.2. I captured the apparent value of learners working together in small groups, which seemingly provided a supportive unit in which they could learn, in the following way:

> *"Throughout this process learners became more and more invested in the learning process. I feel that by making use of an experiential learning process, it has made the content more 'real' and less confrontational. Learners enjoyed working in their groups, where they complimented each other's strengths. This in turn seems to have contributed to an overall positive experience of being taught an enriched Natural Sciences curriculum"* (RJ, 31 October 2016, lines 139-143).

Throughout the PRA-workshops learners indicated that they enjoyed the way in which they were learning as part of the project. They made numerous remarks containing words such as "enjoy", "nice" and "wonderful" when expressing their views after being taught the enriched Natural Sciences Curriculum. Photograph 4.3 provides supportive evidence of the

learners' positive experiences, as indicated by a learner showing a thumbs-up after completing an activity during PRA2.

Photograph 4.3: Learner showing a thumbs-up, possibly indicating a positive experience after an activity (PRA2)

These positive experiences are supported in the data that I captured in my research diary and field notes. In this regard, the learners' commitment to their involvement could be observed throughout the intervention and the data generation process. The number of learners who attended the sessions varied between 30 (28 August 2015), 29 (22 October 2015), 28 (31 October 2015) and 30 during the member-checking session held on 31 October 2016 (one year later). Their attendance and participation thus confirm the learners' commitment, despite the sessions being after hours, often on a Friday afternoon. I captured this idea as follows in my reflective journal:

"The learners attended the various sessions, even though it was after school ended, it was extremely hot during the sessions in the computer room and various sessions were conducted on Friday afternoons. I was amazed at the level of commitment that the learners portrayed throughout this study. This commitment, dedication and participation are in contrast with my perception, where I thought that students in rural areas are not committed to education" (RJ, 31 October 2016, lines 192-202).

Photograph 4.4 provides further evidence of how committed the learners were to participate in the intervention and their own learning. In this example, one of the learners felt ill, yet did not want to go home. She said that she did not want to *"miss out on the learning"* (RJ, 22 October 2015, lines 84-85).

Photograph 4.4: The learner who felt ill, yet attended the session, being committed to learn and complete the intervention (PRA2)

The learners' increased self-confidence was evident in the reflections that they completed on what they had learned during each session. More specifically, the learners' initial reflections were short and condense, but as the intervention progressed, the learners seemingly became more confident in their own abilities, resulting in progressively more comprehensive reflections as the intervention progressed. This can be seen in the reflections of the participants captured as an example in Photographs 4.6 and 4.7.

The learners' commitment to participate and learn was furthermore depicted in the homework activities they completed. Even though the Win-LIFE intervention did not fall in the formal school programme, participants seemed dedicated to complete the tasks that were requested of them. My co-researcher noted the following during the sixth intervention session: *"Almost all the learners completed their homework"* (FNCR, 30 September 2015).

4.2.1.2 Subtheme 1.2: Increased self-confidence to contribute more comprehensively in class

At the start of the intervention, some learners seemed hesitant to actively engage in the activities. One of the groups in particular did not actively participate at the start of the project; however, they started to engage in an active way during the fifth intervention session, as depicted in Photograph 4.5.

Photograph 4.5: The group that was initially passive, actively participating during PRA2

The learners' increased self-confidence was evident in the reflections that they completed on what they had learned during each session. More specifically, the learners' initial reflections were short and condense, but as the intervention progressed, the learners seemingly became more confident in their own abilities, resulting in progressively more comprehensive reflections as the intervention progressed. This can be seen in the reflections of the participants with an example captured in Photographs 4.6 and 4.7.
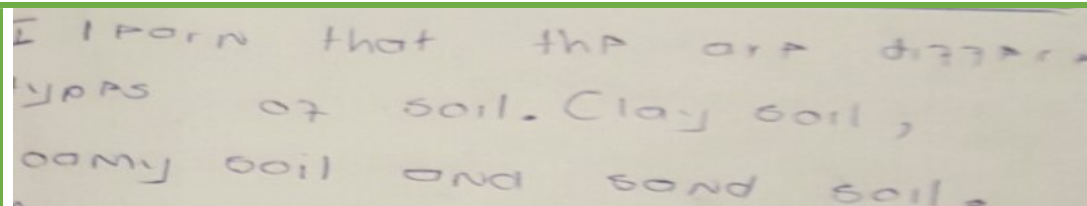
Photograph 4.6: First reflection of Participant 25 (intervention session 1)
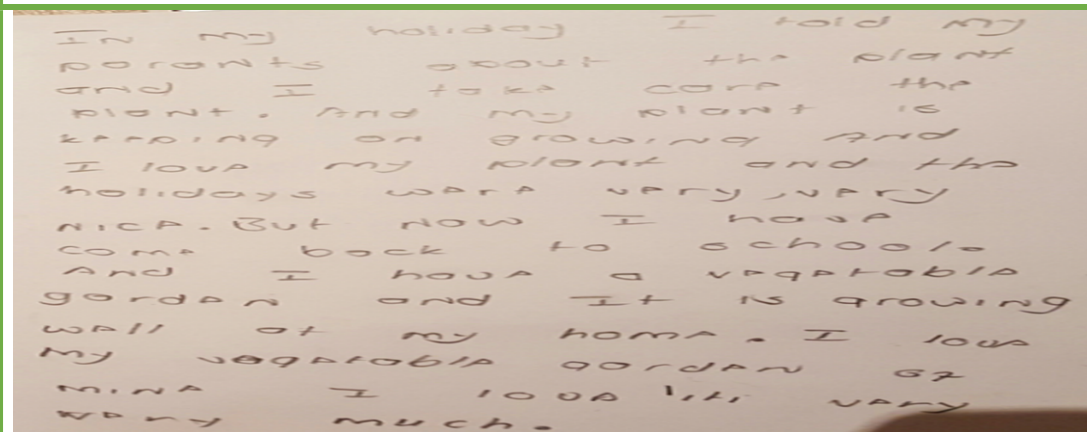
Photograph 4.7: Fourth reflection of Participant 25 (intervention session 7)

These reflections seemingly display the participants' confidence to more comprehensively contribute as the study progressed. In further support, Photographs 4.8 and 4.9 capture the learners' rather lengthy reflections towards the end of the intervention in comparison to their reflections during the second PRA-workshop.
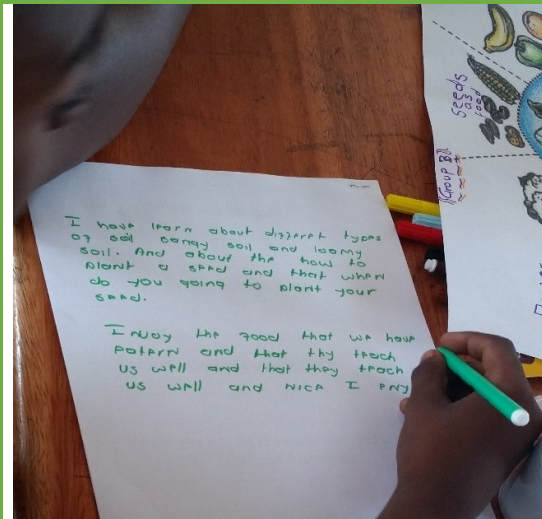
Photograph 4.8: Learners reflecting during PRA2 | Photograph 4.9: Learners reflecting during PRA2
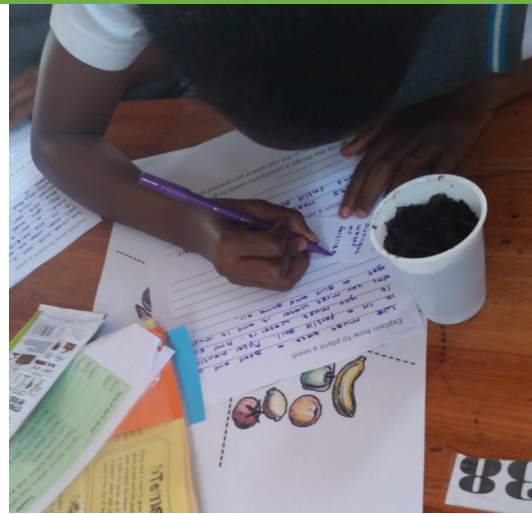
The learners' self-confidence to reflect consequently increased as the intervention progressed. I observed that they gained confidence in both their academic and writing abilities, which resulted in more extensive contributions. In this regard, I noted the following: *"Learners seemed more at ease with writing in their reflective journals. I had to motivate them a lot, to make them understand that participation is more important than spelling and grammar"* (RJ, 18 September 2015, lines 33-35). At a later stage, I noted: *"After today's session, I feel that the learners are starting to gain more confidence in their academic writing. They are writing more than during the first sessions. They are also more eager to participate during the sessions"* (RJ, 22 September 2015, lines 37-39). My co-researcher similarly noted that: *"Learners are eager to participate, and answer questions in unison"* (FNCR, 22 October 2015).

My reflections during and after the Win-LIFE intervention attest to this. Following the second intervention, I noted: *"Practical learning by sampling the different types of soil. Learners truly enjoyed the practical experience. They were also more eager to participate in class and to write in their workbooks"* (RJ, 16 September, lines 17-19).

Throughout, we encouraged all learners to participate and not be hindered by the possibility of spelling and grammatical errors. This may have put learners at ease and allowed them to focus on the content, encouraging them to participate. During the member-checking session, the learners confirmed this notion by indicating their preference to actively participate. In this regard, my co-supervisor commented: *"Learners indicated that they prefer: doing, thinking and writing, drawing"* (FNCR, member-checking, 31 October 2016).

4.2.1.3   Subtheme 1.3: Value of a supportive facilitator

The Win-LIFE facilitators' positive feedback and support evidently cultivated a learning environment characterised by warmth and support, which in turn actually contributed to a positive learning experience and outcome. During the second PRA-workshop, a learner commented: *"I told my parents how they were so kind, and teaches us and explain the difficult words for us"* (PRA2, RA, 22 October 2015, p. 9, G4).

In addition to uncovering knowledge by following a welcoming approach, the applied approach allowed the research team to encourage participation by, for example, involving learners who initially did not seem eager to participate in the learning process. This was done, by, for example, giving them special tasks. After reflecting on my initial experiences, I noted the following: *"Most of the learners were eager to participate, but there is one group that shows very little interest in participating. I will need to focus on involving all the learners in the learning process"* (RJ, 16 September 2015, line 14). My notes a week later captured that: *"... and the group that initially seemed passive is starting to warm up. I empowered the one learner in the passive group by making him my assistant. That seemed to have a positive effect on the group"* (RJ, 23 September 2015, lines 47-50). The possible effect of supportive facilitators is likewise captured in Photographs 4.10 and 4.11, pointing to the learners' involvement, displayed happiness and facilitator support.

| Photograph 4.10: Learners and working and seemingly positive about learning (PRA2) | Photograph 4.11: Facilitator walking around to ensure that the learners understand the task at hand (PRA2) |

Later, when reflecting on the fifth intervention session, I indicated the possible value of supportive facilitation when a learner related this approach to acquiring knowledge and experiencing care. I captured my experience in my reflective journal in the following way:

"Today was amazing. I was taken aback by one of the learners that gave me a necklace that she made. She said thank you for teaching me, and thank you for caring. This moment made me realise that how big impact a little attention and positive feedback can have on learners" (RJ, 30 September 2015, lines 55-58).

As confirmation of the research team's observations throughout the intervention and data generation process, learners again emphasised that they enjoyed our teaching approach in the course of member-checking. During this session, they made the following comments:

- *"We still love you guys"* (MC, 31 October 2016, p. 24, G4).
- *"I really loved doing this ... Love you!"* (MC, 31 October 2016, p. 21, G4).
- *"I liked that you were very kind and very understandable when we didn't understand"* (MC, 31 October 2016, p. 27, G5).

In support of comments such as these, my co-supervisor noted the following: *They indicated that they would rather participate when the teacher is friendly* (FN, MCCS, 31 October 2016).

4.2.2   Theme 2: Outcome of experiential learning experiences

Theme 2 entails the outcome of the learners' experiential learning experiences. This theme comprises three subthemes, namely increased knowledge, skills acquisition and retention of newly gained knowledge and skills. Table 4.2 captures the inclusion and exclusion criteria that apply to Theme 2.

Table 4.2: Inclusion and exclusion criteria for Theme 2

Theme/subtheme	Inclusion criteria	Exclusion criteria
Theme 2: Outcome of experiential learning experiences	All data that relate to the value of experiential learning and the outcome of the Win-LIFE intervention	All data that relate to the value and outcome of the teaching of the learners that cannot be related to the Win-LIFE intervention or experiential approach that was implemented
Theme 2.1: Increased knowledge	All data that indicate increased knowledge in the topics covered in the Natural Sciences Grade 5 CAPS curriculum	All data that indicate skills acquisition or retention of knowledge and skills following the Win-LIFE intervention or that point to increased knowledge in the Life Skills subject area
Theme 2.2: Skills acquisition	All data related to the acquisition of the skills that relate to the subject content of the Grade 5 Natural Sciences Curriculum	Data that relate to increased knowledge or retention of newly gained knowledge and skills following the Win-LIFE intervention in both the Natural Sciences and Life Skills subject areas
Theme 2.3: Retention of newly gained knowledge and skills	Data that indicate retention of knowledge following the Win-LIFE intervention in terms of content covered in the intervention as part of the Natural Sciences curriculum	Data indicating which knowledge and skills were required without highlighting the retention thereof, or data relating to the retention of knowledge and skills not included in the Natural Sciences curriculum

4.2.2.1   Subtheme 2.1: Increased knowledge

The Win-LIFE intervention was structured in such a way that it supports the CAPS curriculum, covering content that is applicable to the Natural Sciences and Life Skills

subject areas for Grades 4 to 6. The enriched curriculum was furthermore structured in such a way that it applied to the specific context in which it was implemented. The aim was for all lessons to enrich the learners' existing knowledge and to enable them to acquire skills that they could apply to their personal lives.

The inductive thematic analysis that I completed indicated just how the learners gained knowledge about plants, components of a plant, what a plant needs to grow, different types of soil, fertilisation, compost, crop rotation, germination and vegetable gardens during the Win-LIFE intervention. In my efforts to identify the knowledge that the learners gained, I asked them questions prior to teaching new content and then requested them to reflect on the knowledge they gained following the intervention session. The depth of the progression of prior knowledge and newly gained is illustrated in Photographs 4.12 and 4.13. These photographs indicate how a learner was initially only able to describe what soil is, whereas she could later distinguish between the different types of soil.

| **Photograph 4.12: Learner's indication of prior knowledge (second intervention session, participant 2)** | **Photograph 4.13: Learners' acquired knowledge following a lesson on soil (second intervention session, participant 2)** |
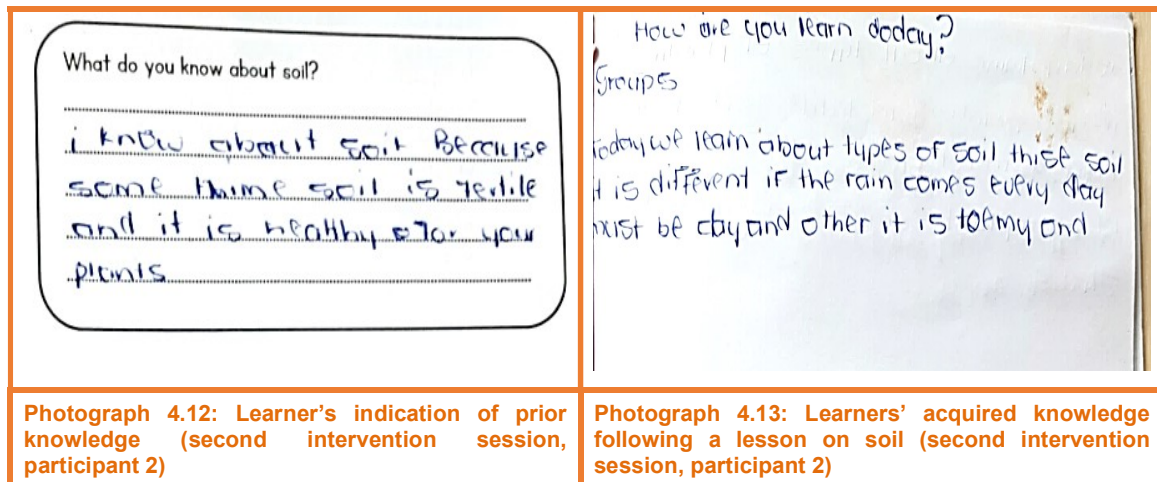
In support of this claim that learners acquired new knowledge, learners were also able to recall the different types of soil during both the PRA-workshops (four weeks later) and member-checking (one year later). I noted the following when capturing this idea: *"They were able to report back that loamy soil will be the best, because it is fertile, and name the different types of soil"* (RJ, 31 October, lines 107-109). At a later stage I noted: *"During the member-checking the learners were able to recall the knowledge they acquired during the enriched Natural Sciences curriculum"* (RJ, 31 October, lines 172-174). My notes are confirmed by the notes that a learner made during the member-checking session, as captured in Photograph 4.14.
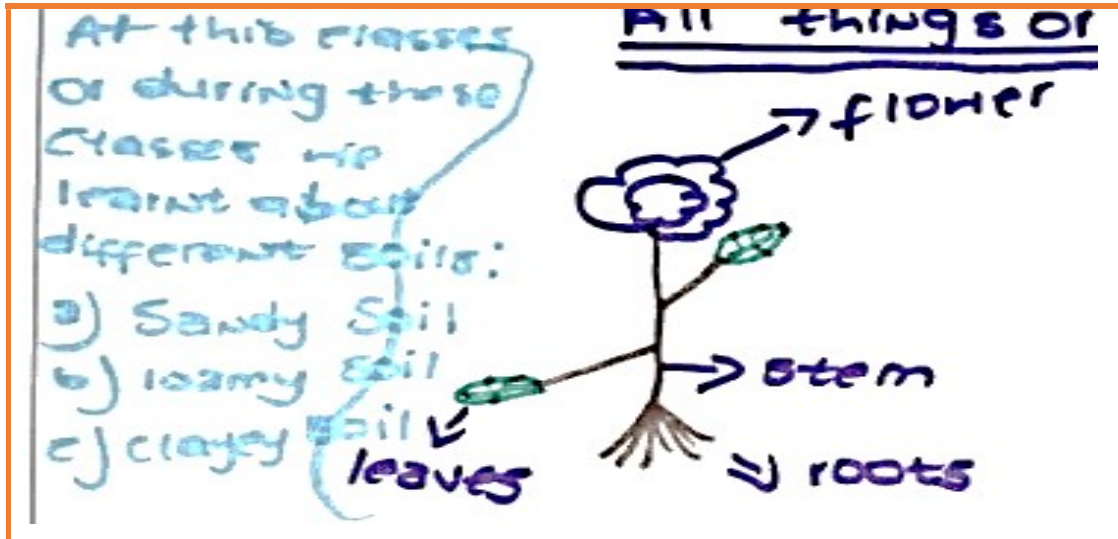
Photograph 4.14: Learner recalling what was learned (member-checking, participant 11)

In the same way, learners also gained new knowledge about the other topics mentioned earlier on, as a result of the Win-LIFE intervention. With regard to the lesson on compost, some learners indicated that they had no knowledge at the start of the lesson, moving to an understanding of the topic by participating in the intervention. Photographs 4.15 and 4.16 provide supportive evidence of this result.
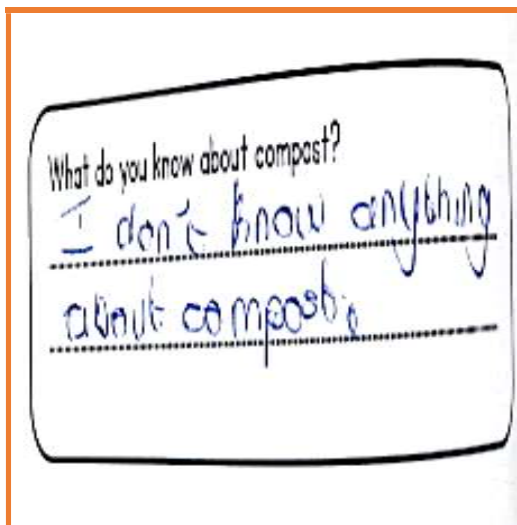
Photograph 4.15: Learner indicating no prior knowledge on compost (participant 23)

Photograph 4.16: Learners recalling new knowledge during PRA1 (Group 4, which participant 23 formed part of)

81

During the data generation session, as well as a year later when I conducted member-checking, learners were still able to indicate the reasons for using compost, capturing their ideas as follows:

- *"To make our plants to grow well"* (PRA1, 19 October 2015, G3).
- *"So, that your plant can grow well and straight. And a compost ... makes your soil to be fertile"* (PRA1, 19 October 2015, G6).
- *"I remember that if we want our plants to grow fast we must do a compost first and then plant"* (MC, 31 October 2016, p. 14, G1).
- *"I learn that compost is the best for the plant"* (MC, 31 October 2016, p. 8, G2).

Even though I could observe the learners' increased knowledge throughout the intervention, I was pleasantly surprised with their ability to indicate the newly acquired knowledge a year later when I conducted member-checking. I reflected on this in the following way:

> *"Throughout the process, I was constantly amazed at the amount of knowledge the learners took in during each session. This was evident in their reflective journals, their homework and their feedback during the revision of the previous lesson at the start of the next lesson. I believe that the knowledge that the learners acquired during this process, was solidified in their long-term memory. The reason for saying this, is because a year after our last PRA session- we had our member-checking. During the member-checking the learners were able to recall the knowledge they acquired during the enriched Natural Sciences curriculum"* (RJ, 31 October 2016, lines 154- 162).

Generated data indicated such increased knowledge for all topics covered as part of the Win-LIFE intervention. This is evident in learners' notes before and after sessions, in the data generated after completion of the intervention as part of the PRA-based workshop sessions, in photographs taken from the homework that learners completed and/or the workbooks they compiled in class, as well as in our observation notes. Examples are captured in Photographs 4.17 to 4.22, demonstrating new knowledge gained in different areas, as indicated in different data sources.

Photograph 4.17: Homework activity on the different equipment required for a vegetable garden (participant 5, first intervention session)

Photograph 4.18: PRA-poster on different equipment required for a vegetable garden, (PRA1, G1)

Photograph 4.19: Learner workbook on the different parts of a plant and what a plant needs to grow (P14, G1)
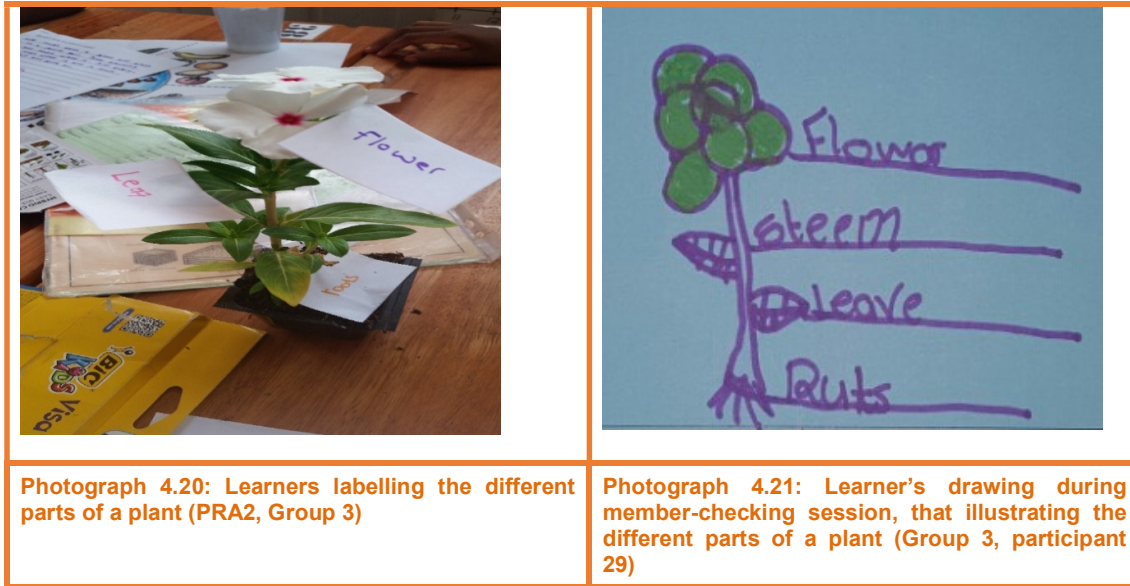
Photograph 4.20: Learners labelling the different parts of a plant (PRA2, Group 3)

Photograph 4.21: Learner's drawing during member-checking session, that illustrating the different parts of a plant (Group 3, participant 29)
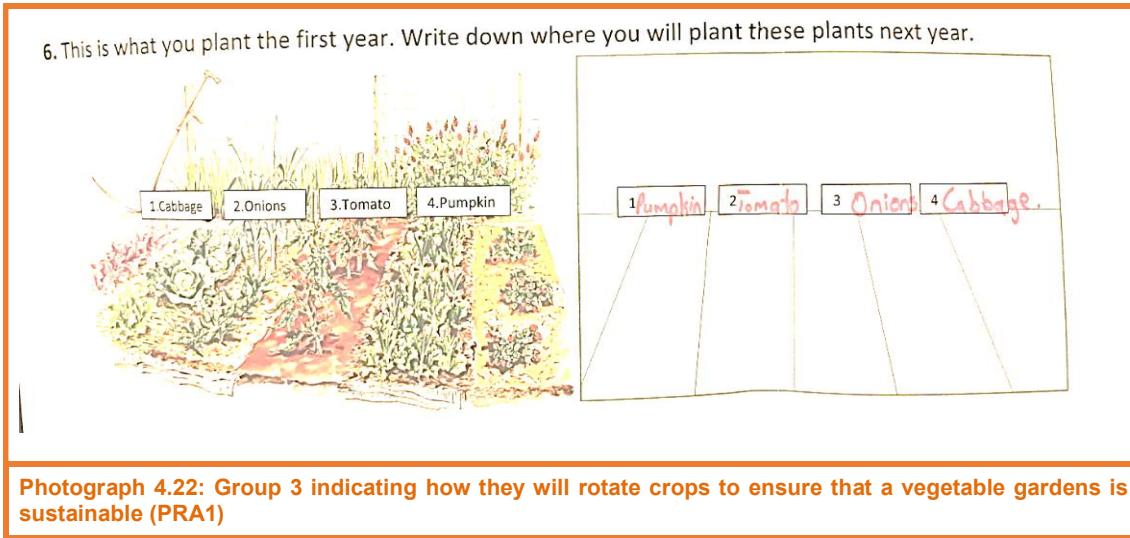
Photograph 4.22: Group 3 indicating how they will rotate crops to ensure that a vegetable gardens is sustainable (PRA1)

In support of the visual data, learners reported that they gained knowledge as a result of their participation in the Win-LIFE project. Examples of their contributions include: *"I learn that in the plant there is different things. It is roots, stem, leaves and flower. And I learn that plant need water, air, soil and sunlight."* (PRA2, RA, 22 October 2015, p. 26, G3). Another learner wrote: *"The vegetable will not grow well when it not being rotate"* (PRA1-poster, 19 October 2015, G4). This is furthermore captured in my co-researcher's field notes: *"What did you learn? We learn about plants and vegetables. What did you enjoy? Learning"* (FNCR12, 22 October 2015, lines 389-390); as well as in my reflective journal, where I wrote: *"Even though they did not know about crop rotation, they were eager to learn"* (RJ, 18 September 2015, line 32). After this specific lesson, learners seemingly understood the

concept of crop rotation. One of the participants wrote in his book: *"I know about it that you should not plant in the same place"* (Workbook, p. 19, G5).

In addition to merely reporting on newly gained knowledge, the learners were encouraged to capture their experiential learning experiences of observing certain topics such as germination and planting seeds. Photographs 4.23 and 4.24 portray some learners' observation of the germination process, as well as their awareness of plants in their environment. Their realisation of acquired knowledge and what they had learned is evident in remarks such as: *"We learn about how to plant a vegetable garden we even learnt about germination and how to do things"* (PRA2, RA, p. 21, G4); and *"I have learned about how to plant a plant and how to a compost and parts of the plants. And how to take care of the plants"* (PRA2, RA, p. 27, G3).
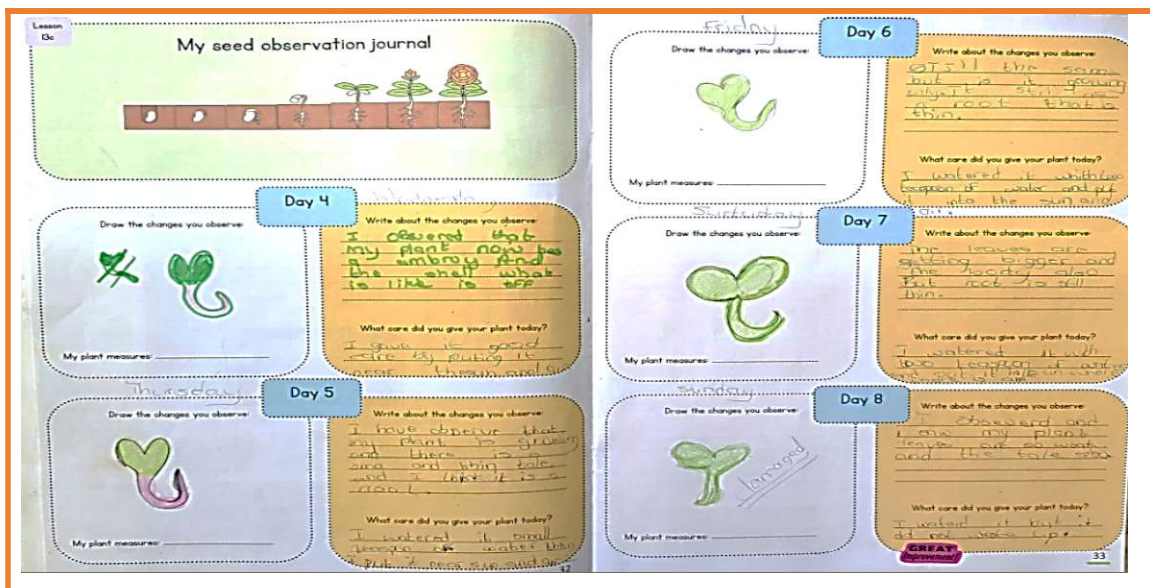
Photograph 4.23: Learner's observational notes in his germination journal (learner journal, participant 9)

Photograph 4.24: Observational drawings on different plants in the environment (participant 9, third intervention session)

4.2.2.3   Subtheme 2.2: Skills acquisition

The Win-LIFE intervention's focus did not fall on rote-learning of information, as the aim was rather to enrich the learning process and to allow the learners to gain insight into how new knowledge can be used practically. Throughout the intervention, the research team attempted to complement the learners' knowledge with practical application, in support of skills development. The learners seemingly acquired skills by means of the experiential teaching approach that was applied. This subtheme represents data that relate to the skills that the learners acquired in relation to the Natural Sciences curriculum. Learners specifically learned how to plant a seed, start a vegetable garden, germinate their own seeds and rotate crops.

In teaching learners how to plant a seed, we showed them a video, after which they completed an activity of drawing the different steps of planting a seed. After this exercise, they had to plant a seed themselves. In her field notes, my co-researcher reported: *"Writing*

how to plant a seed eagerly...Can plant a seed step-by-step. All learners actively participate. They label their plants and cover their seeds" (FNCR12, 22 October 2015). When learners reflected on this activity, they stated: *"We must take a seed and plant it in fertile soil. After planting it you must water it and it must get sun and some air"* (PRA1-activity, 19 October 2015, p. 11, G1); and: *"You need to have fertile soil to plant seed you need enough water and your seed must enough sunlight so that your seed can grow and your seed you must take good care of it ... you must dig a hole so that it can get in the hole and then when you finish and cover it"* (PRA2-activity, 22 October 2015, p. 23, G4), thereby displaying the necessary knowledge on how to plant seeds.

For germination, learners were taught basic information about the germination process in order to apply this knowledge and develop the required skills. They documented the process by means of drawings and writing down the steps. Learners also had to germinate their own seeds and monitor the germination process (as captured in Photograph 4.25). They were furthermore equipped with the skill of evaluating the requirements to plant a seed (Photograph 4.26). As part of the experiential learning process, learners determined that loamy soil is the best soil for gardening, as captured in Photograph 4.27 and indicated on all six groups' PRA-posters that were created during the first PRA-workshop (Photograph 4.30). The planting of a seed process and germination are also illustrated in Photograph 4.29.

| Photograph 4.25 Learners germinating their own seeds, in order to grow plants (fifth intervention session) | Photograph 4.26: Learners reading the instructions to plant seeds (PRA2) |

Photograph 4.27: Learners collecting different types of soil samples, determining that loamy soil is the best for a vegetable garden (second intervention session)

Photograph 4.30: Learners enjoying the practical approach by applying their newly acquired knowledge on planting a seed (PRA2)

Photograph 4.28: All six the groups' responses to what the best type of soil is for gardening

It therefore appears as if the learners acquired the skills that were taught during the Win-LIFE intervention. When one of the activities focused on the skills they were taught and whether or not these had been acquired, for example I noted: *"The learners planted seeds, and they were able to do it correctly. They were also able to name what a seed needs to grow and label the different parts of a plant. They were also able to name the different parts of a plant that we can eat"* (RJ, PRA2, lines 79-82).

4.2.2.4   Subtheme 2.3: Retention of newly gained knowledge and skills

In presenting the enriched Natural Sciences curriculum, we aimed to facilitate learning, not only in terms of knowledge and skills acquisition, but attempting for these to be retained. To this end we included videos, colourful handouts, keyrings containing summarised information on, actual objects such as seeds and plants and experiments such as germinating plants. By applying these methods, we aimed at enriching the learning process

as well as experience. As such we combined visual, auditory and kinaesthetic modes of learning.

The inclusion of different sensory experiences during the intervention seemingly contributed to the learners' acquiring and retaining the newly gained knowledge and skills. To this end, participants reflected as follows during the second PRA-workshop: *"I enjoyed learning about when we go to homes they gave us food and we were watching videos"* (PRA-reflective activity, p. 9, G4); *"... how to plant in to the garden"* (PRA-reflective activity, p. 24, G4); and *"I enjoyed when we went outside and picked soil loamy, clay and sandy soil"* (PRA2-22 October 2015, p. 1, G2). The participants confirmed their knowledge and skill retention during the member-checking session a year later, saying: *"I remember when I planted my own seeds"* (MC, 31 October 2016, p. 8, G2); and also *"I learned about planting our own plants and plant parts"* (MC, 31 October 2016, p. 1, G2).

Following intervention session eight, I noted the learners' retention of newly acquired knowledge and skills in my reflective journal entry: *"Today was a brief recap of all the information that we taught the learners over the past month. I was amazed at how much information was retained. It seems like the learners listened effectively and through actively engaging with the learning material, they made the information their own. I look forward to the PRA-workshops"* (RJ, 30 September 2015, lines 67-70). During the PRA-workshops that followed learners once again demonstrated knowledge and skill retention. They were namely able to indicate where to plan a vegetable garden and why a certain space would be the most suitable. On their PRA-posters, the various groups indicated the following: *"Number 2, because the spot that we have chosen it is good for planting and get lots of sun"* (PRA1, 19 October 2015, G6); *"Number 2, because there is a path of air and sun near the house so that you can take care of it"* (PRA1, 19 October 2015, G4); *"Number 2, because there is no rocks"* (PRA1, 19 October 2015, G1); and *"Number 2, because it has no hard rocks and it is flat. And also, good for planting. And the sun will come up brightly"* (PRA1, 19 October 2015, G3). Learners were furthermore able to demonstrate and motivate their choice of soil, with all groups indicating *"loamy soil"* (PRA1, 19 October 2015, G1-G6).

Learners were also able to identify the different equipment required to start a vegetable garden, as indicated in Photographs 4.18 and 4.31. All the groups were furthermore able to

name the different parts of a plant and which parts they could eat (PRA2-posters, 22 October 2015, G1-G6). An example is included in Photograph 4.32.

| Photograph 4.31 Learners' poster of the equipment required to start a vegetable garden (PRA2, Group 6) | Photograph 4.32: Learners' poster of which parts of a plant can be eaten (PRA2, Group 1) |

In addition to retaining knowledge and skills in the period shortly after the intervention, long-term retention of the knowledge and skills are evident from the data that were generated during the member-checking session one year after the Win-LIFE intervention had been implemented. Appendix J, provide examples of the retained knowledge and skills, as indicated by what the learners confirmed during the member-checking session.

The worksheets that the learners completed during the member-checking session once again confirmed their knowledge and skills retention as an outcome of being taught an enriched Natural Sciences curriculum. During the member-checking session, learners for example stated: *"I remember when talking about types of soil like, loamy, sandy and clay soil. I remember planting a seed. I remember that every vegetable must be moved after a year and planted another one. Things that a garden or vegetable garden needs. Sun, air, water and soil"* (MC, 31 October 2016, p. 9, G4); and *"The vegetable garden you must water it and must be put where the sun is shining and you must cover it with something so that the animals must not eat. And you must find the right soil that your plant to grow so*

well" (MC, 31 October 2016, p. 9, G4). As such, participants seemingly retained knowledge and skills related to the components of a plant, what a plant needs to grow, the different soil types, compost, crop rotation, germination and the planting of seeds. It is evident that the learners furthermore apparently realised the value of their newly acquired knowledge and skills, which possibly resulted in positive attitudes and the implementation thereof.

4.2.3   Theme 3: External application value of the enriched Natural Sciences curriculum

This theme entails the results and application possibilities of the newly gained knowledge and skills as a result of the Win-LIFE intervention and enriched Natural Sciences curriculum. Three subthemes apply, namely potential value of homework to support learning and participation, transferring knowledge and skills to others, and positive attitudes and the implementation of their newly acquired knowledge and skills.

Table 4.3: Inclusion and exclusion criteria for Theme 3

Theme/subtheme	Inclusion criteria	Exclusion criteria
Theme 3: External application value of the enriched Natural Sciences curriculum	All data related to the external application value of the Win-LIFE intervention that is outside the classroom and school context	All data that relate to the external application value of knowledge and skills that do not link to the Win-LIFE intervention or to the content covered in the intervention
Theme 3.1: Potential value of homework to support learning and learner participation	All data that relate to the potential value of homework included in the Win-LIFE intervention in support of learners' learning and participation	All data that relate to the transfer of knowledge and skills to others or to positive attitudes and the learners' implementation of newly acquired knowledge and skills in everyday life
Theme 3.2: Transferring knowledge and skills to others	All data that relate to the transfer of knowledge and skills to others, stemming from the Win-LIFE intervention, such as to parents, family members or the broader community	All data related to the potential value of homework in support of learning and participation of learners, or to learners being positive about the implementation of newly acquired knowledge and skills

Theme/subtheme	Inclusion criteria	Exclusion criteria
Theme 3.3 Positive attitudes and the implementation of newly acquired knowledge and skills	All data that relate to the participants' positive attitudes about the implementation of newly acquired knowledge and skills, such as starting a vegetable garden	All data that relate to the potential value of homework in support of learning or to the transfer of knowledge and skills to others, for example parents and community members

4.2.3.1 Subtheme 3.1: Potential value of homework to support learning and learner participation

Each homework activity was aimed at revising new knowledge and putting it into practice, Even though learners did not initially seem to be committed to having their parents sign their homework, they started completing their homework with their parents/caregivers/guardians after the research team had emphasised the importance of this. To this end, my co-researcher noted the learners' dedication to comply with this request as follows: *"Almost all of the learners completed their homework"* (FNCR, 30 September 2015).

One of the activities that was seemingly very successful was the germination journal. For this activity, learners were requested to observe the germination process by drawing and documenting it in their germination journals. They evidently enjoyed this as well as being actively engaged at home. In this regard, my co-researcher stated: *"The germination diary was completed by 75% of the participants"* (FNCR, 28 September 2015). I similarly reflected on the value of the germination journal being an effective homework activity. I noted: *"Today we started with the germination process.... I feel that the germination journal fully engaged the learners in the learning process, because they were actively applying their new knowledge and skills at home. The learners also put a lot of effort into it"* (Reflective journal, 31.10.2016, lines 125-133).
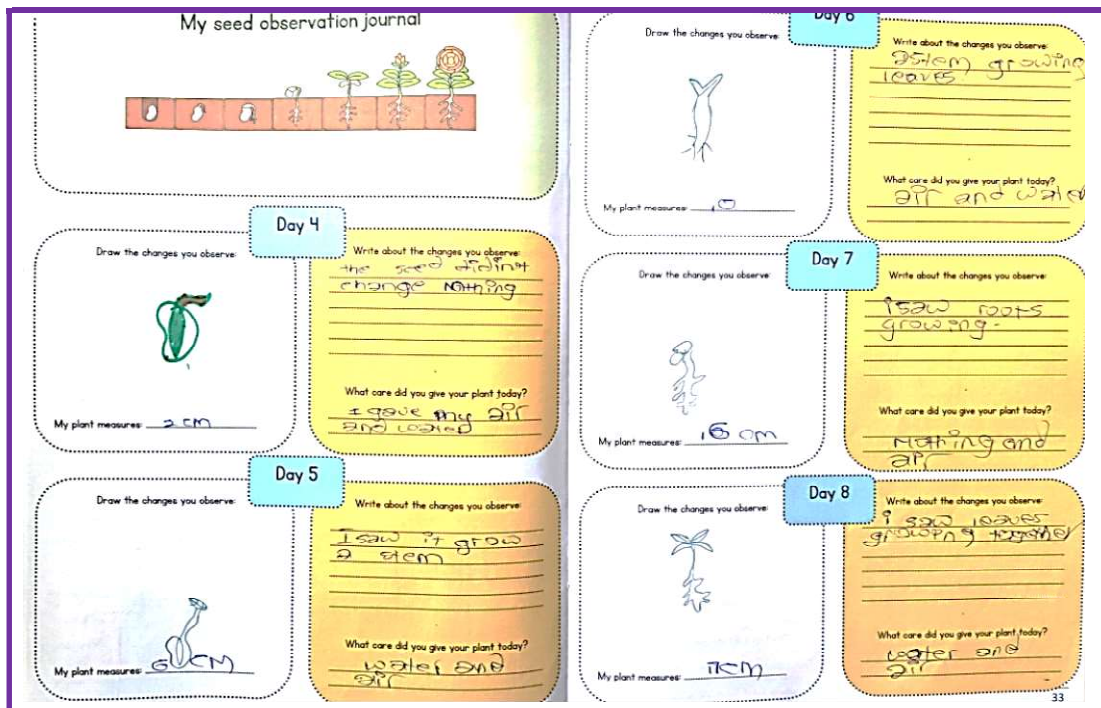
In support of our observations, learners apparently also valued this specific homework activity. Photograph 4.33 provides supportive evidence, capturing a learner's reflections on this activity, which was completed during their school holiday.

Photograph 4.33: Learner's homework activity, where he reflected on the germination process (p25)

Learners seemingly put a lot of effort into recording the growth of their plants in their germination journals. This view is depicted in Photograph 4.34, illustrating how homework supported learning and learner participation.

Photograph 4.34: Learner recording the growth of her plant (p23, G4)

These examples and photographs provide evidence of the value of homework, considering that it presumably assisted learners in engaging in new knowledge at home.

4.2.3.2   Subtheme 3.2: Transferring knowledge and skills to others

This subtheme concerns the result that learners seemingly transferred their newly gained knowledge and skills to their parents and other family members, with the possibility of

knowledge and skill transfer being implied. Most learners seemingly completed their homework with other family members. I noted in this regard: *"Twenty-seven of the thirty participants' parents or family members signed their homework"* (RJ, 18 August 2015, line 38).

When investigating the possibility of knowledge and skills transfer, learners indicated that they had told their parents and family members about the knowledge they gained during the intervention. During the second PRA-workshop, the participants were, for example, asked to answer the following question: *"Did you tell your parents about vegetable gardens? What did you tell your parents?"* Twenty-eight of the 30 learners who attended that PRA-workshop indicated that they had told their parents/caretakers/guardians about vegetable gardens. They said: *"Yes - I told them and they said it was very good that I have learned something interesting. I told them that at the project it is very interesting and I learned many things"* (PRA2-RA, 22 October 2015, p. 27, G3); *"Yes - I tell them about what plant need and what a plant have. I tell my parents that there is a compost. And what a plant need and what the plant have. And different types of food. You can say flower, fruits, leafs, roots and stem. THANK YOU VERY MUCH!"* (PRA2-RA, 22 October 2015, p. 27, G3); *"Yes- I say you have many types of soil and plants need soil, sun, air, water"* (PRA2-RA, 22 October 2015, p. 18, G5); and *"I told my parent about nutrients, how to start a vegetable garden and how to keep yourself healthy"* (PRA-RA, p. 21, G4).

This result is furthermore indicated in the learners' reflective journals and confirmed by the fact that they completed their homework. My co-researcher, in further support, noted this during the second PRA-workshop. When compiling field notes, she stated: *Did you tell your parents? Shout in unison-YES!* (FNCR, PRA2, 22 October 2015). During the member-checking session, I asked the learners once again whether or not they had told their parents about the enriched Natural Sciences curriculum. My co-supervisor noted their response in her field notes as follows: *Did you tell your parents? Shout in unison-YES!* (FNCS, MC, 31 October 2016).

4.2.3.3 Subtheme 3.3: Positive attitudes and implementation of newly acquired knowledge and skills

In line with the CAPS, the Win-LIFE health-promotion intervention aimed to support learners in applying the knowledge and skills they gained in everyday life. In an attempt to determine whether or not the learners were able to apply their knowledge and skills, I posed the following question to the participants during the second PRA-workshop, and then again during the member-checking session: *"Who has a vegetable garden at home?"* In response, 23 of the 30 participants indicated that they had vegetable gardens at home (PRA2, RA, 22 October 2015). This result points to the majority of the learners being able to apply their newly gained knowledge and skills at home. During the member-checking session, learners indicated their answers on answer sheets once again with 22 of the participants responding positively (MC, 31 October 2016).

As such it seemed apparent that the learners practiced their newly acquired knowledge and skills at home. Learners' positive attitudes towards the Win-LIFE intervention could also be confirmed by them emphasising the value the intervention implied. I noted their responses and stated: *"At first, they did not see the value of being taught about vegetable gardens, but in the end, they could see the value thereof"* (Reflective Journal, 31 October 2016, line 45). In support, learners' positive attitudes about what they gained are illustrated by the following statements:

- *"We need a vegetable garden to eat healthy food"* (PRA-RA, p. 20, G5).
- *"And sometimes it is important to have a vegetable garden in your home because sometimes your mother need some vegetables and she don't have money to buy some. She can take one in her vegetable garden"* (PRA2-reflective activity, p. 26, G3).
- *"Some vegetables are most important to us and in our body. Because some of them have vitamins that our body needs"* (p. 18, G5, member-checking).
- "*I felt very happy when they taught me to make vegetable garden because I knew that growing vegetable is very important and you must take care of your garden for example you must always have sun"* (MC, 31 October 2016, p. 7, G2).

The abovementioned statements emphasise the learners' insight into the value of vegetable gardens. They were evidently able to make the link between starting a vegetable garden and practicing healthy eating habits. This emphasises the possibility that learners developed positive attitudes towards their newly gained knowledge and skills. Some of these positive attitudes that could be identified include the value of having a vegetable garden (PRA1-workshop reflective activity); the importance of a vegetable garden in order to promote healthy living and nutrition (member-checking session); vegetable gardens as part of sustainable living (PRA1-workshop reflective activity); and that learning can be fun (reflective journals, observations, field notes and member-checking).

4.3   FINDINGS OF THE STUDY

In this section I relate the identified themes and subthemes to the existing body of knowledge. I highlight correlations and contradictions, and indicate new insight that stem from this study. I also identify silences in the data that may be explored further in follow-up studies, where applicable. The aforementioned is summarised in Table 4.4 which is followed by the relevant discussions.

Table 4.4: Summary of findings of the study

Theme	Main finding	Existing Literature	Relation with existing literature
Theme 1: Advantages related to the underlying experiential learning approach followed for the Win-LIFE intervention	1.1 An experiential learning approach can create and foster a positive attitude and commitment towards learning	• Sparrow (2008) • Skelly & Bradley (2007) • Ozer (2007) • Waliczek, Bradley & Zajicek (2001) • Kolb (1999; 2014) • Baker, Terry, Bridger, & Winsor, (1997) • Korinek et al. (1999) • Beard & Wilson (2006) • Sproule et al. (2005) • DoE (2011) • Canaris (1995)	Support existing literature
		• Waliczek, Bradley and Zajicek (2001) • Klemmer, Waliczek & Zajicek (2005) • Sparrow (2008)	Silences in data when compared to existing literature

Theme	Main finding	Existing Literature	Relation with existing literature
		• Skelly & Bradley (2007) • Hall et al. (2016)	New insights
	1.2 An experiential learning approach can result in increased self-confidence and more comprehensive contributions in class by the learners	• Loucks-Horsley et al. (1990) • Kolb (1999) • Beard & Wilson (2006) • Sparrow (2008) • Sproule et al. (2005)	Support existing literature
		• Waliczek, Bradley & Zajicek (2001)	New insights
	1.3 A supportive facilitator is key to the success of an experiential learning approach	• Deltuva (2010) • Chapman (2013) • Bentley (2016) • Wilson (2000) • Rowe et al. (2007)	Support existing literature
		• Sulkowski & Joyce-Beaulieu (2014)	New insights
Theme 2: Outcome of experiential learning experiences	2.1 Experiential learning will lead to increased knowledge as an outcome of experiential learning	• Kolb (1999; 2014) • Sulkowski & Joyce-Beaulieu (2014) • Kolb (1999) • Beard & Wilson (2006) • Ozer (2007)	Support existing literature
	2.2 Skills acquisition as an outcome of experiential learning	• Ozer (2007) • Thorp & Townsend (2001) • Adams & Hamm (1998) • Sulkowski & Joyce-Beaulieu (2014) • Kolb (1999) • Beard & Wilson (2006) • Bentley (2016)	Support existing literature
	2.3 Retention of newly gained knowledge and skills as an outcome of experiential learning	• Ozer (2007) • Kolb (1999; 2014) • Sproule et al. (2005) • Leveritt et al. (2013)	Support existing literature

Theme	Main finding	Existing Literature	Relation with existing literature
Theme 3: **Potential value of homework to support learning and learner participation**	3.1 The inclusion of joint activities can support learning and learner participation	• Hall et al. (2016) • Navarro et al. (2007) • Ozer (2007) • Thorp & Townsend (2001) • Waliczek, Bradley & Zajicek (2001)	Support existing literature
		• Ozer (2007) • Burchi et al. (2011)	Silences in data when compared to existing literature
	3.2 Transferring knowledge and skills to others e.g. their parents, caregivers, family and friends	• Botha (2014)	Support existing literature
		• Ozer (2007)	New insights
	3.3 The enriched curriculum resulted in positive attitudes and learners applying and implementing newly acquired knowledge and skills	• Hall et al. (2016) • Rogers (1961) • Sparrow (2008) • Canaris (1995) • Beard & Wilson (2006) • Story et al. (2009)	Support existing literature

4.3.1 Suitability of the underlying approach of the Win-LIFE intervention for Grade 5 Natural Sciences learners

The Win-LIFE intervention follows an experiential learning approach. As such, the focus fell on actively engaging Grade 5 learners in the learning process by exposing them to authentic learning experiences, which possibly resulted in fostering a positive attitude and commitment towards learning amongst them (Kolb, 1999; 2014).

4.3.1.1 Positive attitudes and commitment towards learning as a result of the implementation of an experiential learning approach

During the Win-LIFE intervention, we specifically attempted to create opportunities for learners to explore learning content on a concrete practical basis and then reflect on their learning (Kolb, 1999; 2014). For example, when soil types were discussed the learners had to look for various types of soil, experience the textures and observe the colours and reactions when pressed together in their hands after the content has been presented (Sparrow, 2008). As such, learners experienced soil on a concrete level before moving on to application, as suggested by Kolb (1999; 2014) as well as Sparrow (2008).

As a result, the findings of this study indicate that the learners were actively engaged throughout the learning process, which fostered positive attitudes amongst them, and commitment in terms of their own learning. This finding correlates with studies conducted by Beard and Wilson (2006), as well as Ozer (2007), who state that experiential learning can be regarded as fun, resulting in learners learning more effectively than in the case of conventional learning. In confirmation of Beard and Wilson's (2006) work, the learners in this study were able to grasp the authentic application value of the content and could therefore possibly transfer the knowledge to their parents and family members, as also proposed by Ozer (2007).

The Win-LIFE health-promotion intervention involved activity-based learning with the aim of supporting learners to become responsible citizens (DoE, 2011; Skelly & Bradley, 2007; Sproule et al., 2005). In correlation with existing studies (Skelly & Bradley, 2007; Sproule et al., 2005), such increased responsibility was noted in this study, considering that the learners' attitudes and commitment to learning exponentially increased. Baker, Terry, Bridger and Winsor's (1997) research was also confirmed in this study, as the learners could also make sense of the knowledge and skills associated with the content taught (Grade 5 Natural Sciences curriculum). The learners' positive attitudes and commitment towards learning were a result of activity-based group work that fostered a sense of connectedness amongst the learners as proposed by Korinek et al. (1999) and Canaris (1995).

In this regard Leveritt et al. (2013) note that one of the benefits of experiential learning is that learners will have a positive experience of learning. As such, the findings of the current study confirm existing research, as could be seen in learners' excitement to learn about soil, compost, plants, seeds and vegetable gardens. The learners' excitement and positive attitude towards learning are furthermore supported by the work of Bohn and Schmidt (2008), who found that a supportive learning environment could support learners' academic achievement and confidence related to learning.

Studies conducted by Waliczek, Bradley and Zajicek (2001) and Klemmer, Waliczek and Zajicek (2005) that relate to experiential learning indicate that learners who were exposed to experiential learning activities, such as gardening, Natural Sciences' marks improved. This is a silence in my findings that can be further investigated, since this study was not

concerned with learners' achievement but rather with their experiences after being taught an enriched Natural Sciences curriculum. These studies emphasise the importance of experiential learning in which learners are actively engaged in the learning process (Loucks-Horsley et al., 1990).

Another possible silence relates to Sparrow's (2008) study that suggests that experiential learning interventions result in learners' engagement in and motivation for everyday learning. This study solely focused on the Grade 5 learners' experiences after being taught an enriched Natural Sciences curriculum and not on everyday learning and engagement. The data generated in this study also suggest that experiential learning can have a positive influence on learners' attitude towards school and healthy living. This notion is supported by Sparrow (2008). This study merely focused on the immediate effect of experiential learning on Grade 5 learners' experiences after being taught an enriched Natural Sciences curriculum. I cannot assume that these positive effects will be lasting. However, during the member-checking, the learners still seemed positive about their experiences after being taught an enriched Natural Sciences curriculum.

This study provides possible insights in addition to the research done by Skelly and Bradley (2007) that suggests that school gardens may lead to learners' increased commitment. This study contributes to their research by suggesting that an enriched Natural Sciences curriculum, in collaboration with school gardens, could possibly further explore the long-term advantages of combining an enriched Natural Sciences curriculum with school gardens.

In addition, a study conducted by Hall et al. (2016) suggests that education is the key to addressing educational challenges such as food security, poor teacher training, limited resources and overcrowding of classrooms. The approach followed during this study could possibly contribute to implementing and addressing these challenges at ground level.

4.3.1.2 Increased self-confidence and contributions in class as a result of the implementation of an experiential learning approach

The findings of this study indicate that the learners' ability to reflect on the information that they had been taught increased as the study progressed. This correlates with Loucks-Horsley et al.'s (1990) research that highlights an enhanced ability to critically examine learning content as an outcome of experiential learning. Sparrow (2008) and Bentley (2016) explain that these findings align with the positive outcomes of experiential learning.

Beard and Wilson (2006) as well as Bentley (2016), note that two of the benefits of experiential learning are creative inquiry and empirical observation. In this study, I found that learners could creatively inquire and progressively engage in the content as their confidence increased. Throughout the health-promotion intervention, the learners thus became more engaged in and motivated to participate in their own learning, as also indicated by a study conducted by Sproule et al. (2005). In further support Kolb (1999) and Bentley (2016) both indicated that learners' increased participation and engagement with newly gained knowledge can be viewed as a benefit of experiential learning.

A possible new insight stemming from this study relate to increased confidence resulting in learners making more comprehensive contributions in class. A study conducted by Waliczek et al. (2001) suggests that experiential learning will increase learners' attention span and attitude towards learning. However, their study did not indicate that it could also possibly lead to increased confidence in learners as found in the current study.

A warm and supportive learning environment stands at the core of experiential learning, where the facilitator supports learners to experience and gain new knowledge and skills. By cultivating a warm and supportive learning environment in which participation is more important than spelling and grammar, learners could gain access to the curriculum in this study (Bentley, 2016). This supports the findings of Rowe et al. (2007) and Wilson (2000), resulting in learners being positive and commited, acting with increased confidence.

This study's findings could possibly add to Sulkowski and Joyce-Bealieu's (2014) study, in which it is recommended that teachers should connect with learners at a social-emotional

level. This study could possibly serve as an example of how teachers can connect with learners in support of their self-confidence and participation in their own learning.

4.3.2 Retained knowledge and skills acquisition as a result of the Win-LIFE intervention

As a result of this study, a positive change was noted in the learners' participation, academic confidence, knowledge, skills and the transfer and application of their newly acquired knowledge and skills, as also suggested in a study conducted by Beard and Wilson (2006). Similar results have been obtained in studies completed by Bentley (2016), Sulkowski and Joyce-Beaulieu (2014). These studies' results indicate that experiential learning has the potential of a positive effect on learners' application of the new knowledge and skills that they acquired.

The learners' ability to retain knowledge and skills can possibly be attributed to the multimodal approach to learning and teaching that was used as part of the enriched Natural Sciences curriculum, which supports the findings of Sproule et al. (2005). This study implemented an enriched Natural Sciences curriculum by using experiential and creative learning techniques that contributed to learners effectively acquiring knowledge and skills. The findings is closely related to the research findings of Slavin (1995) and Adams and Hamm (1998).

In addition, the manner in which the learners were able to demonstrate their newly gained knowledge and skills, correlates with Kolb's (1999; 2014) view that experiential learning is effective in facilitating the acquisition of knowledge and skills. Group work formed an integral part of this approach, resulting in learners seemingly feeling safe within their small groups, complimenting one another, and distributing tasks amongst group members.. Learners indicated that they preferred working in groups rather than working alone. In this regard, Waliczek et al. (2001) indicate that experiential learning and group work can support interpersonal relations amongst learners. Bentley (2016) similarly found that group work enhances learners' interpersonal relations.

Finally the findings indicate that the learners were able to understand the relevance of healthy living and how it relates to vegetable gardens and growing their own food. This also

correlates with Leveritt et al.(2013) and the work of (Bentley, 2016) according to whom experiential learning can provide learners with insight into how their knowledge and skills can be applied to an authentic learning situation. This was also observed during this study in that learners realised the importance of healthy living and the advantages of having personal vegetable gardens. Learners did also relate how their knowledge and skills related to different soil types, planning a vegetable garden, germinating and planting seeds as well as to rotate their crops in order to have a sustainable vegetable garden.

4.3.3 Broader application following learners' participation in the Win-LIFE intervention

The external application value of this study was considered throughout, seeing that it formed part of the theoretical framework. The transfer of knowledge and skills to parents and the larger community is an aspect that formed part of this study's theoretical framework (Bronfenbrenner, 1994). The participants indicated that they discussed the content of the Win-LIFE health-promotion intervention with their parents and other family members. It is difficult to gauge the extent to which the knowledge was transferred to the participants' parents, family members and the community. This is an aspect that should be investigated further in order to determine the extent and the possibility of change in the participants' system (Ozer, 2007).

This study also focused on the possible transfer of knowledge to the Grade 5 learners' parents and family members. Throughout the study, the learners confirmed that they have transferred the knowledge about vegetable gardens and healthy-living to their parents and other family members, but I have no concrete proof that this is in fact true. According to the generated data, the learners transferred and applied the knowledge and skills taught by means of an enriched Natural Sciences curriculum.

Parental involvement was also gauged by parents signing the learners' homework and completed activities in their workbooks. The PRA-workshop and member-checking also addressed parental involvement and the learners' transfer of knowledge. Canaris (1995) notes that the best method to gauge the positive effect of learners' transfer of knowledge to their parents and other family members is information sheets that should be completed by the parents or family members. This is a limitation that should be considered when

discussing the extent of the transfer of knowledge. This limitation is also noted in my co-researcher's study (Bentley, 2016).

Although the precise extent of the learners' application of their newly gained knowledge and skills cannot be quantified, during the PRA-workshops, as well as during the member-checking, most of the learners indicated that they have started a vegetable garden at home. This notion supports the MDG's (2013) goals to address food security by enabling households to grow their own vegetables in an attempt to support health, nutrition and overall food security. Burchi et al. (2011) also suggest that broad multi-sector approaches should be followed in order to implement health-promotion interventions in different communities. As such, I feel that this indicates a possible silence in the findings of this study.

Botha (2014) developed the Win-LIFE health-promotion intervention for Natural Sciences and Life Skills in order to promote health and well-being by using an enriched curriculum. An integral part of Botha's (2014) aim was to involve the entire school as well as the parents. Therefore, homework formed an integral part of this study; the value of homework was seen throughout the data generated by this study. However, Ozer (2007) did not consider the influence of homework as a strategy to support school- and community-based interventions in his research.

4.4   CONCLUSION

In this chapter I presented the results of the study in terms of the themes and subthemes that were identified. I then interpreted these in terms of existing literature when discussing the findings.

In the next and final chapter I will come to conclusions based on the findings discussed in this chapter. To this end, I address the research questions formulated in Chapter 1. I will highlight the potential contribution of the study and reflect on some limitations. Finally, I will formulate recommendations for future training, practice and research.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In Chapter 4 I discussed the findings of the study. Throughout the chapter I indicated how the findings of this study align with and contradict existing literature. I also identified silences and new insights where relevant.

In this chapter I provide an overview of the preceding chapters. I then come to conclusions based on my initial research questions as formulated in Chapter 1. I discuss the potential contributions of the study. I also discuss the challenges that I experienced during this study and reflect on those challenges. I conclude with recommendations for future training, practice and research.

5.2 OVERVIEW OF PRECEDING CHAPTERS

In **Chapter 1** I introduced the study and explained my rationale for undertaking this research. I presented the purpose of the study, namely to gain insight into Grade 5 learners' experiences of an enriched Natural Sciences curriculum as part of the Win-LIFE health-promotion intervention and broader research project. I formulated research questions, clarified my working assumptions and explained the key concepts that relate to this study. I introduced the selected research paradigms and the methodological strategies that I employed for data generation, documentation and analysis. I concluded the chapter briefly by stating the ethical guidelines and quality criteria to which I strived to adhere in undertaking the research.

In **Chapter 2** I explored existing literature that relates to the field of research. I focused on various literary perspectives and, for example, discussed the importance of well-being for optimal development, schools' role in supporting learners and families in resource-constrained communities, school gardens as one avenue of such support and how school curricula may potentially form part of interventions in support of learners and communities. I concluded by explaining how Bronfenbrenner's Bio-Ecological model (1979), as underlying theoretical framework,

guided this research. Throughout this chapter I considered the South African context as backdrop to the study I conducted, as well as the possible implications this may have had.

In **Chapter 3** I provided an explanation of the manner in which I undertook the empirical part of my study in order to address the research questions. I discussed interpretivism as epistemology and the case study design by applying PRA-principles as qualitative research methodological approach. I discussed the qualitative research design I used as well as strategies for data generation and the documentation and analysis procedures. These strategies included PRA-based activities, reflective journals (researcher and participants), photographs and field notes. I concluded the chapter by reflecting on the role that I fulfilled in this study as well as the way in which I followed ethical guidelines and quality criteria in order to ensure the rigour of the study. I also commented on my role as qualitative researcher.

In **Chapter 4** I discussed the results of the study in terms of the three main themes and associated subthemes that I identified after completing inductive thematic analysis. I then presented the findings of the study by relating the results I obtained to relevant existing literature in the field. I highlighted the results that support existing literature and that contradict what is known, as well as silences in the data and new insights that emerged.

5.3 CONCLUSIONS

In the sub-sections I come to conclusions. I structure my discussions according to the secondary research questions that directed this study. As a final deduction, I reflect on the primary research question I formulated in Chapter 1.

5.3.1 Secondary research question 1: *How does the Win-LIFE intervention's content and method of instruction compare to the existing Grade 5 Natural Sciences CAPS curriculum?*

The enriched Natural Sciences curriculum as part of the Win-LIFE intervention (Appendices D and E) includes the following: information about the equipment

needed to start a vegetable garden, different types of soil, germination, how to plant a seed, how to create a compost heap, crop rotation, parts of a plant, parts of a plant that we can eat and photosynthesis (only for Grade 6). This aligns with the current CAPS, yet enriching the curriculum in terms of the experiential learning approach that is followed and the focus on activity-based sessions. As such, the Win-LIFE intervention is structured to convey knowledge and skills, but also to cultivate positive attitudes towards learning by using a hands-on approach. It furthermore includes a homework component that involves joint activities between learners and their parents or caregivers.

This study predominantly focused on the Life and Living topic (Topic 1), as set out in the Grade 5 Natural Sciences CAPS (Appendix C). The theme on plants was namely explored by discussing content that relates to the different parts of a plant, what a plant needs to grow and the different types of soil. The skills and attitudes that relate to these themes were enriched by using group work, authentic learning experiences, reflection and audio-visual material such as videos and songs. Topic 2 of Life and Living relates to the plant life cycle, pollination, fertilisation, compost, germination and the growth of a plant.

For the current study, Topics 1 and 2 were taught as an integrated whole, based on the reason that all the themes that apply are interrelated. Even though the plant life cycle and pollination forms part of the Grade 6 curriculum, a video was displayed to the learners in order to guide them to form a holistic idea of the content that was being taught. Fertilisation was discussed as part of the lesson on the different types of soil, and then related to how learners can compile their own compost in order to make soil more fertile, after watching a video, completing an activity and reflecting on their learning.

The germination process was taught by giving learners seeds to germinate. They also had to keep a journal of the germination process by drawing the physical changes of their germinating seed and describing what they saw. This activity was completed over a school holiday and formed part of home-based experiential learning. Through this approach, learners had the opportunity to actively engage in the germination process as well as the growth of a plant. As such, the Win-LIFE

approach focused on bringing theory to life, providing examples of what learners were taught theoretically. Learners were actively involved in uncovering new knowledge and skills, as well as in observing the practical application of what was learned.

5.3.2 Secondary research question 2: *Which knowledge, skills and attitudes are portrayed by Grade 5 learners after being taught Natural Sciences by means of an enriched curriculum as part of the Win-LIFE intervention?*

During data generation following the Win-LIFE intervention, and also during the member-checking session, learners were able to position the new knowledge and skills they had acquired due to their participation in the project. In this regard, learners were able to recall the equipment that is required to create a vegetable garden, which includes the use of the various gardening tools. Learners were also able to identify the most suitable place to start a vegetable garden and to motivate why a specific place would be suitable for starting such a garden. In terms of soil types, they were able to indicate which soil is best for planting plants and to explain the reasons for this.

Furthermore, learners gained knowledge and skills on how to plant seeds. They could explain how to prepare a piece of land before planting, how to plant seeds and how to tend to these. They were also able to integrate their newly gained knowledge and skills on creating compost and how to rotate crops. The learners were able to articulate the benefits of a compost heap in terms of the fertility of the soil. They could recall the things they would need to make their own compost heaps and grasped the concepts associated with crop rotation. In terms of plants, the learners were able to name the different parts of a plant, describe what a plant needs to grow and identify the different parts of plants that can be eaten.

In terms of values and attitudes that are included in the CAPS, learners understood the value of having vegetable gardens in support of a healthier lifestyle and to adhere to healthy eating habits. Learners thus showed insight into the notion of

sustainable living by means of creating vegetable gardens, due to understanding the benefits of having one's own vegetable garden.

The knowledge, skills and attitudes that were found to be portrayed to Grade 5 learners by being taught an enriched Natural Sciences curriculum, indicate the value of implementing this enriched curriculum. Learners furthermore gained insight into the value of learning and the power of their newly acquired knowledge and skills. As a result they developed more positive feelings about learning and how they contributed to their own learning processes.

5.3.3   Secondary research question 3: *How can Grade 5 learners apply newly gained knowledge and skills in their home environments and personal lives?*

In this study I found that Grade 5 learners applied the knowledge that they gained on starting vegetable gardens at home. They communicated the information to their parents and caregivers. As learners had to complete homework activities with their parents or caregivers at home, parent involvement seemingly increased as the research process progressed. Learners' commitment in involving their parents and caregivers and completing tasks at home in support of their own learning was evident and seemingly resulted in positive attitudes towards learning.

Throughout the intervention we aimed to provide learners with information that they can apply at home. We, for example gave them handouts on how to start a vegetable garden, as well as a keyring with information on planting seeds.

Twenty-three of the 30 learners subsequently indicated during the second PRA-workshop (22 October 2015) that they have a vegetable garden at home. This is significantly higher than the initial seven learners at the start of the intervention (12 September 2015). During the member-checking, 22 of the learners reported that they still had vegetable gardens at home (31 October 2016), implying that learners possibly applied their newly gained knowledge and skills in their home environments and personal lives. Even though these findings were not confirmed by the learners'

parents, family members or caregivers, learners themselves indicated this on two occasions (22 October 2015 & 31 October 2016).

5.3.4 Conclusions in terms of the primary research question

The study was guided by the following primary research question: *How do Grade 5 learners experience an enriched Natural Sciences curriculum presented as part of the Win-LIFE intervention?*

Findings of the study indicate that the underlying experiential learning approach that was used as part of the Win-LIFE intervention resulted in several possible outcomes. The first outcome relates to the advantages of following an experiential learning approach as part of the enriched Win-LIFE interventions. These advantages are seen in learners making more meaningful contributions as the intervention progressed that possibly indicate that learners experienced the Win-LIFE intervention as positive. This outcome concludes that Grade 5 learners experienced the enriched Natural Sciences curriculum as part of the Win-LIFE intervention as positive and that learning can be enjoyable.

The learners enjoyed the intervention sessions that enriched the Grade 5 Natural Sciences curriculum. This also resulted in them displaying a positive attitude and commitment towards learning, which gradually increased as the sessions progressed. In addition, learners became more confident and committed to participate. This in turn resulted in learners' contributions in class being more comprehensive, which I would argue would have positively impacted on the extent of their learning.

In terms of the experiential learning approach we followed, learners specifically enjoyed the hands-on activity-based approach of the intervention. The assumption can be made that the positive experiences of the learners can be attributed to the underlying experiential approach of the Win-LIFE programme. The Win-LIFE programme encouraged learners to actively participate in their learning, thereby acquiring knowledge and skills that could be retained– even after a year.

The second outcome that supports the notion that learners seemingly experienced the enriched Natural Sciences curriculum as pleasant, is supported by learners' retention of the knowledge and skills that was presented as part of the Win-LIFE intervention. Throughout the intervention sessions, PRA-workshops and the member-checking session the learners could recall the content taught as well as the related skills. This result argues in support of the first outcome that suggests that learners experienced the Win-LIFE intervention as enjoyable and relevant. To this end, activity-based learning, experiential learning, group work, regular reflections, hands-on learning and homework joint homework with parents/caregivers proved to have a positive effect on learning and can therefore be regarded as suitable.

The third outcome argues that the learners' positive attitudes and homework activities could possibly result in remitting the information to their parents/ caregivers. In situating these positive outcomes within the theoretical framework of the study, it is evident that learners' positive experiences can be ascribed to change that was initiated in their micro- and meso-systems. Twenty-eight of the 30 learners indicated that they had communicated the content of the enriched Natural Sciences curriculum to parents, other family members or caregivers. In addition, they reportedly applied their newly gained knowledge and skills in the form of vegetable gardens at home.

5.4 POSSIBLE CONTRIBUTIONS OF THE STUDY

Findings of this study contribute to the existing body of knowledge that relate to healthy and sustainable living, as well as the value of enriched school curricula in supporting resource-constrained communities. More specifically, the study adds insight into the positive effects of implementing an enriched Natural Sciences curriculum to aid health and well-being. Combined with the study of Bentley (2016), this study indicates that knowledge and skills can be taught (and learned) when following an experiential learning approach. As such, it contributes to the use of experiential learning with intermediate phase learners when teaching Natural Sciences. The positive outcomes of the enriched curriculum and experiential learning, could possibly inspire teachers in the profession to more often rely on experiential learning when teaching young learners.

As the current study forms part of the broader Win-LIFE project, it also adds to the body of knowledge generated in the project. As such, it forms part of a knowledge base that can lead to follow-up research in this area. In terms of the broader practical application value of the findings, this study possibly contributed to the Grade 5 learners' knowledge and skills that relate to Natural Sciences and more specifically vegetable gardens. The learners seemingly transferred their newly acquired knowledge and skills to their parents, caregivers and guardians, and supported vegetable gardens at home. As a result of a great number of learners (23 during PRA-based workshops and 22 during the member-checking session) had vegetable gardens at home. These vegetable gardens could contribute to the health and well-being of the learners and their families, in support of food security.

5.5 CHALLENGES AND LIMITATIONS OF THE STUDY

Due to the limited scope of selected methodology, this study lacks generalisability. However, the intention was never to generalise the findings of the study, considering that my selected methods do not seek generalisable findings. The findings of the study pertain to 30 specific learners in Grade 5, in one school in the Bronkhorstspruit area. The study aimed to provide insight into the experiences of these learners after being taught an enriched Natural Sciences curriculum as part of the Win-LIFE intervention based on the detailed and in-depth descriptions I provide, findings may be transferred to similar research settings as decided by the reader.

Another possible limitation relates to the cultural and language differences between the participants and the research team. These differences could have had an influence on how I interpreted the generated data. However, I attempted to avoid the potential negative influence of these differences by regularly reflecting with the research team, and by means of continuous discussions with my supervisors.

A challenge I specifically experienced concerns the time lapse between the data generation workshops and the member-checking I conducted. As stipulations by the Gauteng Department of Basic Education inhibit research during the fourth school term and due to personal circumstances that resulted in me not being able to complete this session before the fourth term. I was only able to complete the

member-checking in the third term of 2016 as negotiated with the school. This delay in fact confirmed the learners' retention of the knowledge and skills to which they were exposed a year earlier. Even though learners took a while to open up at the start of the member-checking session, prompting questions soon put them into the necessary mind set to actively participate and confirm what they had learned as part of the Win-LIFE intervention.

Finally, I experienced technical difficulties, which resulted in all my audio recordings being corrupted. As a result, I faced the challenge of merely relying on field notes compiled by my supervisor and co-researcher, reflective journals, visual data and posters. Fortunately, all of us compiled extensive field notes, and reflected throughout the research study.

5.6   RECOMMENDATIONS

In the following sub-sections I make recommendations for future training, practice and research. These recommendations are based on the findings of this study.

5.6.1   Recommendations for training

Taking into account the positive outcomes of experiential learning indicated by this study, I recommend that student teachers should receive training on this approach, and on implementing a hands-on approach when teaching primary school learners. It is important to emphasise the positive effects of experiential learning such as increased learner participation, possible increased knowledge and skills, as well as the ability to reflect on and creatively solve problems, and to rely on these when teaching learners.

PRA per se should also become part of the subject methodology modules. Student teachers should therefore become acquainted with the method and learn how to implement it in practice.

This approach should be integrated into the training of Educational Psychologists, in order to assist them in understanding how certain barriers to learning could be addressed by means of integrating an experiential learning approach in order to

enrich the curriculum. This pre-service training will enable Educational Psychologists to effectively support teachers (practical application techniques) and learners (access to the curriculum).

In addition to pre-service learning, the Win-LIFE intervention may be used as an example of an enriched Natural Sciences and Life Skills curriculum that is structured in accordance with CAPS and that can be used as part of teachers' in-service training opportunities. This programme is hands-on and can be easily implemented in the classroom, making it potentially suitable for being part of Continuing Professional Teacher Development (CPTD) programmes.

5.6.2   Recommendations for practice

Based on the positive outcomes of the intervention as indicated by the findings, I recommend that the Win-LIFE intervention (Life Skills and Natural Sciences enriched curricula) should be implemented among more teachers at the school where the intervention took place, as well as in schools situated in similar contexts. The school that participated in this study already started a vegetable garden, resulting in the possibility of the teachers implementing experiential learning as a means to expand and develop the vegetable garden and to use it in different subject areas.

The structure and content of the Win-LIFE intervention can potentially also be used in future as a practical example for teaching people to start and maintain vegetable gardens. To this end, the intervention can potentially be adapted for other contexts, such as community volunteers, in order to encourage them in starting vegetable gardens in support of their own health and well-being.

5.6.3   Recommendations for future research

Based on the findings of this study, I recommend that future research be conducted in the areas mentioned below.

- The implementation of the Win-LIFE intervention in other schools from rural, peri-urban and urban communities in order to determine how contextual factors

may potentially influence learners' experiences of being taught an enriched curriculum.

- A descriptive follow-up study on the long-term effects of being taught by means of an enriched curriculum such as the Win-LIFE intervention.

- An exploratory study on the effect of the Win-LIFE intervention on the school's performance and academic achievement of the learners.

- Research to determine the extent to which the knowledge and skills acquired by the learners were transferred to parents, other family members and caregivers.

- Investigating the value of creative, expressive techniques as part of an enriched curriculum and the effect it may/may not have on learners' attitudes towards learning.

- Determining to what extent knowledge and skills were transferred to learners' parents and caregivers.

- Follow-up research about the long-term effects of the Win-LIFE intervention on the learners and their families.

- Investigating the experiences of parents whose children had been taught by means of the Win-LIFE enriched curriculum in order to determine to what extent activities, such as joint homework activities, supported the transfer of knowledge and skills.

5.7 CONCLUDING REFLECTIONS

In this study, I explored the experiences of Grade 5 learners after being taught Natural Sciences by means of an enriched curriculum in the form of the Win-LIFE intervention. Throughout the implementation of the intervention and the data generation process, it became clear that the additional attention and support increased the learners' involvement in the learning process. I relate the positive outcomes I observed to the positive experiences of the learners, based on their participation in experiential and cooperative learning. It seems that learners benefited from the experiential learning process that took the form of authentic learning activities, group work and reflective assignments. In addition, they had the opportunity to transfer what they acquired in class by way of joint homework activities involving their parents or caregivers.

From the findings of this study, it can also be concluded that the positive experiences of learners can be associated with the effort and support received in the learning environment. As a result, learners acquired knowledge and skills, were able to retain these and applied them to their personal lives while possibly transferring new knowledge and skills to their parents, other family members and caregivers.

Abrahams, Z. (2011). *HealthKick: Evaluating the impact of a school-based intervention on the dietary adequacy of learners from low-income settings in the Western Cape Province, South Africa.* (Unpublished Med dissertation). Cape Town: University of Cape Town.

Adams, Q., Collair, L., Oswald, M., & Perold, M. (2004). Research in educational psychology in South Africa. In I. Eloff, & L. Ebersöhn (Eds.). *Keys to educational psychology* (pp. 354-373). Cape Town: UCT Press.

Alexander, S. (2010). *Stephanie Alexander kitchen garden foundation*. Retrieved 4/09/2014 from: http://www.kitchengardenfoundation.org.au/.

Alhojailan, M. I. (2012). Thematic analysis: A critical review of its process and evaluation. *Proceedings of the International European Academic Conference (WEI), Croatia*.

Authenticity. (2016). *The Sage Encyclopaedia of qualitative research methods*. doi: 10.4135/9781412963909.n26.

Bagnato, S. J., Neisworth, J. T., & Munson, S. M. (1997). *LINKing assessment and early intervention: An authentic curriculum-based approach*. Baltimore, MD: Paul H Brookes.

Baird, B. N. (1991). In-class poster sessions. *Teaching of Psychology*, *18*, 27-29.

Baker, J. A., Terry, T., Bridger, R., & Winsor, A. (1997). Schools as caring communities: A relational approach to school reform. *School Psychology Review*, 26, 586–602.

Banks, M. (2001). *Visual methods in social research*. USA: Sage.

Barnes, J., Conrad, K., Demont-Heinrich, C., Graziano, M., Kowalski, D., Neufeld, J., Zamora, J., & Palmquist, M. (2012). *Generalizability and transferability*. *Writing*@CSU. Colorado: Colorado State University. Retrieved from: https://writing.colostate.edu/guides/guide.cfm?guideid=65.

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, *13*(4), 544-559. Retrieved from: http://nsuworks.nova.edu/tqr/vol13/iss4/2.

Beard, C., & Wilson, J. (2006). *Experiential learning* (2nd ed.)*. A best practice handbook for educators and trainers.* USA: Kogan Page Limited.

Bell, J. (2010). *Doing your research project*. Berkshire, England: McGraw Hill Education.

Bell, J. (2005). *Doing your research project.* New York, NY: Open University Press.

Bentley, K. (2016). *The experiences of Grade 5 learners of an enriched Life Skills curriculum*. (Unpublished Med dissertation). Pretoria: University of Pretoria.

Berry, J., & Houston, K. (1995). Students using posters as a means of communication and assessment, *Educational Studies in Mathematics*, *29*(1), 21-27. Retrieved from: http://www.jstor.org/stable/3482829.

Black, S. (1996). Redefining the teacher's role. *Executive Educator, 18* (8), 23-26.

Blair, D. (2010). The child in the garden: An evaluative review of the benefits of school gardening. *The Journal of Environmental Education*, *40*(2), 15-38. doi: 10.3200/JOEE.40.2.15-38.

Bohn, D. M., & Schmidt, S. J. (2008). Implementing experiential learning activities in a large enrolment introductory food science and human nutrition course. *Journal of Food Science Education*, *7*, 5-13.

Bond, L., Patton, G., Glover, S., Carlin, J. B., Butler, H., Thomas, L., & Bowes, G. (2004). The Gatehouse Project: Can a multilevel school intervention affect emotional wellbeing and health risk behaviours? *Journal of Epidemiology and Community Health*, *58*(12), 997-1003.

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77 – 101. doi 10.1191/1478088706qp063oa.

Botha, K. (2014). *Nutrition education - Educator's guide, Win-LIFE*. Pretoria: University of Pretoria.

Brewer, J., & Hunter, A. (1989). *Multimethod research: A synthesis of styles*, Sage Library of Social Research Series (Vol. 175). Newbury Park: Sage.

Brighton, C. R., & Moon, T. M. (2007). Action research step-by-step: A tool for educators to change their world. *Gifted Child Today*, *30*(2), 23-27.

Bronfenbrenner, U. & Crouter, A. C. (1983). The evolution of environmental models in developmental research. In P. H. Mussen (Ed.). *Handbook of child psychology* (4th ed., pp. 357–414). Toronto: John Wiley & Sons.

Bronfenbrenner, U., & Morris, P. A. (2006). *Handbook of child psychology*: *Chapter 4*. Wiley Online Library. Retrieved from: http://onlinelibrary.wiley.com/doi/10.1002/9780470147658.chpsy0114.

Bronfenbrenner, U. (1979). Toward an experimental ecology of human development. *American Psychologist*, *32*(7), 513-531. doi: 10.1037/0003-066X.32.7.513.

Bronfenbrenner, U. (1994). Ecological models of human development. In *International Encyclopaedia of Education* (Vol. 3, 2nd ed.). Oxford: Elsevier.

Bronfenbrenner, U. (2005). *Making human beings human*. *Bioecological perspectives on human development*. London: Sage.

Burchi, F., Fanzo, J., & Frison, E. (2011). The role of food and nutrition system approaches in tackling hidden hunger. *International Journal of Research and Public Health*, *8*, 358-373. doi: 10.3390/ijerph8020358.

Byrne, B. M., Oakland, T., Leong, F. T. L., Van de Vijver, F. J. R., Hambleton, R. K., & Cheung, F. M. (2009). A critical analysis of cross-cultural research and testing practices: Implications for improved education and training in psychology. *Training and Education in Professional Psychology, 3*(2), 94-105.

Canaris, I. (1995). Growing foods for growing minds: Integrating gardening and nutrition education into the total curriculum. *Children's Environments*, *12*(2), 264-270.

Carlsson, L. & Williams, P. L. (2008). New approaches to the health promoting school: Participation in sustainable food systems. *Journal of Hunger and Environmental Nutrition*, *3*(4), 400-417. doi: 10.1080/19320240802529243.

Chalmers L., & DeMartino, M. (Eds.). (1958). *Understanding human motivation*. Cleveland, OH: Howard Allen. doi: 10.1037/11305-004.

Chambers, R. (1994). Participatory Rural Appraisal (PRA): Challenges, potential and paradigm. *World Development*, *22*(10), 1437-1454.

Chambers, R. (2002). *Participatory workshops. A sourcebook of 21 sets of ideas & activities*. London: Earthscan.

Chapman, A. (2013). *Concept and principles of experiential learning activities articles.* Martin Thompson: MTa International. Retrieved from: http://www.businessballs.com/experiential_learning.htm.

Chesebro, J. W., & Borisoff, D. J. (2007). What makes qualitative research qualitative? *Qualitative Research Reports in Communication*, *8*(1), 3-14.

Chiwaula, L., Dobson, R., & Elsley, S. (2014). *Drumming together for change: A child's right to quality care in Sub-Saharan Africa*. Glasgow, UK: CELCIS.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education*. London, New York: Routledge Falmer.

Cortina, M. A., Stein, A., Kahn, K., Hlungwani, T. M., Holmes, E. A., & Fazel, M. (2016). Cognitive styles and psychological functioning in rural South African school students: Understanding influences for risk and resilience in the face of chronic adversity. *J Adolesc, 49*, 38-46. doi: 10.1016/j.adolescence.2016.01.010.

Creswell, J. W. (2013). *Qualitative inquiry & research design. Choosing among five approaches* (3rd ed.). USA: Sage.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Los Angeles: Sage.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed method approaches.* Thousand Oaks, CA: Sage.

Creswell, J. W. (2002). *Educational research: Planning, conducting and evaluating quantitative and qualitative research.* Upper Saddle River, NJ: Merrill/Pearson.

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions.* London: Sage.

Crockett, S. J., & Sims, L. S. (1995). Environmental influences on children's eating. *Journal of Nutrition Education, 27*(5), 235-249.

De Vos, A. S., Strydom, H., Fouché, C. B., & Delport, C. S. L. (2005). *Research at grassroots: For the social sciences and human services professions*. Pretoria: Van Schaik.

Deltuva, A. (2010). *Role of experiential learning trainer/facilitator. International Academy of Experiential Education*. Retrieved from: http://www.viaexperientia.net/uploads/Roles-of-EL-trainer.pdf.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2005). *Handbook of qualitative research* (3rd ed.). Thousand Oaks: Sage.

Denzin, N. K., & Lincoln, Y. S. (2000). *Handbook of qualitative research*. London: Sage.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2000). *Handbook of qualitative research* (2nd ed.). London: Sage.

Department of Education. (2008). *The care and support for teaching learning (CSTL)*. Retrieved from: http://www.education.gov.za/Programmes/HealthPromotion/CSTL/tabid/675/Default.aspx.

Department of Education. (2009). *Schooling 2025 and action plan to 2014: Call to action: Mobilizing citizens to build a South African education and training system for the 21st Century*. Pretoria: Government Printers.

Department of Basic Education. (2011). *CAPS: Natural Science and Technology Grade 4-6.* Pretoria: Government Printers.

DiNubile, N. (1993). Youth fitness - problems and solutions. *Preventive Medicine, 22*, 589-594.

Dodge, R., Daly, A., Huyton, J., & Sanders, L. (2012). The challenge of defining wellbeing. *International Journal of Wellbeing, 2*(3), 222-235. doi:10.5502/ijw.v2i3.4.

Doja, M. A., Bould, D., Clarkin, C., Eady, K., Sutherland, S., & Writer, H. (2016). The hidden and informal curriculum across the continuum of training: A cross-sectional qualitative study. *Medical Teacher, 38*, 4.

Durrheim, K., & Wassenaar, D. (2002). Putting design into practice: Writing and evaluating research. In M. Terre Blanche, & K. Durrheim (Eds.). *Research in practice*

applied methodologies for social science. Cape Town: University of Cape Town Press.

Ethics Committee. (2015). Faculty of Education, University of Pretoria. http://web.up.ac.za.

Etikan, I., Musa, S. I., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 2016, 1-4. doi: 10.11648/j.ajtas.20160501.11.

Erlandson, D. A. (1993). *Doing naturalistic inquiry: a guide to methods*. Newbury Park, California: Sage. Retrieved from: http://www.loc.gov/catdir/enhancements/fy0655/93003651-t.html.

Erlandson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry, a guide to methods.* Newbury Park: Sage.

Faber, M. Witten, C., & Drimie, S. (2011). Community-based agricultural interventions in the context of food and nutrition security in South Africa. *South African Journal of Clinical Nutrition*, *24*(1), 21-30.

Faber, M., Phungula, M., Venter, S., Dhansay, M. & Benadé, A.J.S. (2001). *A home-gardening programme focusing on yellow and dark-green leafy vegetables to improve household food security and undernutrition with special reference to vitamin A status of preschool children*. Parow, South Africa: Medical Research Council.

Fanzo, J. (2012). *The Nutrition Challenge in Sub-Saharan Africa.* United Nations Development Programme (working paper). Regional Bureau for Africa. Retrieved from: http://www.undp.org/content/dam/rba/docs/Working%20Papers/Nutrition%20Challenge.pdf.

Fanzo, J. C., & Pronyk, P. M. (2011). A review of the global progress toward the Millennium Development Goal 1 Hunger Target. *Food and Nutrition Bulletin*, *32*(2), 144-157.

Ferreira, R. (2012). Writing a research proposal. In J. G. Maree (Ed.). *Complete your thesis or dissertation successfully: practical guidelines*. Cape Town, South Africa: Juta & Company Ltd.

Ferreira, R. (2006). *The relationship between coping with HIV & AIDS and the asset-based approach.* (Doctoral thesis). Pretoria: University of Pretoria. Retrieved from: http://upetd.up.ac.za/thesis/available/etd-11092006- 135304/.

Ferreira, R., Gericke, G., & Du Toit, P. (2013). *Institutional research theme (IRT) food, nutrition and well-being application for 2013-2013 project funding*. Pretoria: University of Pretoria.

Flick, U. (2009). *An introduction to qualitative research* (4th ed.). London: Sage.

Fraser, B. J. (1994). Research on classroom and school climate. In D. L. Gabel (Ed.). *Handbook of research in science teaching and learning* (pp. 493-541). New York, NY: McMillan.

Food and Agricultural Organisation of the United Nations (FAO). (2014). *The State of Food Insecurity in the World. Strengthening the enabling environment for food security and nutrition*. Retrieved from: http://www.fao.org/publications/sofi/2014.

Fuchs, L. S., Fuchs, D., Hamlett, C. L., Phillips, N. B., & Bentz, J. (1994). Class wide curriculum-based measurement: Helping general educators meet the challenge of student diversity. *Exceptional Children, 60*, 518-537.

Gamm, L., Castillo, G., & Williams, L. (2004). Education and community-based programs in rural areas: A literature review. In L. Gamm, & L. Hutchison (Eds.). *Rural healthy people 2010: A companion document to healthy people 2010* (Vol 3, pp. 167-186). Retrieved from:

http://www.srph.tamhsc.edu/centers/rhp2010/Volume_3/Vol3Ch4LR.pdf [PDF - 81 KB.

Glesne, V. (1999). *Becoming qualitative researchers. An introduction*. New York: Addison Wesley Longman.

Gomm, R., Hammersley, M., & Foster, P. (2000). Case study and generalization. In R. Gomm, M. Hammersley, & P. Foster (Eds.). *Case study method.* London: Sage.

Gorman, D. (2010), Maslow's hierarchy and social and emotional wellbeing. *Aboriginal and Islander Health Worker Journal, 33*(5), 27.

Green, C., Botha, P., & Schönfeldt, H. C. (2004). Needs assessment in a rural community on a commercial farm in South Africa. *Journal of Family Ecology and Consumer Sciences/Tydskrif vir Gesinsekologie en Verbruikerswetenskappe*, *32*, 46-59. Retrieved from: www.ajol.info/index.php/jfecs/article/download/52848/41449.

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Newbury Park: Sage.

Guba, E. G., & Lincoln, Y. S. (1981). *Effective evaluation.* San Francisco: Jossey-Bass.

Guest, G., & McLellan, E. (2003). Distinguishing the trees from the forest: Applying cluster analysis to thematic qualitative data. *SAGE Research Methods*, *4*(1), 3-339.

Hall, K., Sambu, W., Berry, L., Giese, S., Almeleh, C., & Rosa, S. (2016). *South African early childhood review 2016*. Cape Town: Children's Institute, University of Cape Town and Ilifa Labantwana Stacey.

Hammersley, M., & Atkinson, P. (1995). *Ethnography: Principles in practice* (2nd ed.). New York: Routledge.

Hatch, J. A. (2002). *Doing qualitative research in education settings.* Albany, New York: State University of New York Press.

Hayzlett, L. A. K. (2004). *The learning garden: A case study*. (Unpublished master's thesis). University of Northern Iowa, Cedar Falls, IA.

Hickey, S., & Giles, M. (2004). Towards participation as transformation: Critical themes and challenges. In S. Hickey, & G. Mohan (eds.). *Participation: From tyranny to transformation?* (pp. 3-24). New York: Zed.

Hoelsher, D. M., Evans, A., Parcel, G. S., & Kelder, S. H. (2002). Designing effective nutrition interventions for adolescents. *Journal of the American Dietetic Association*, *3*(102), 52-63.

Holden, M. T., & Lynch, P. (2004). Choosing the appropriate methodology: Understanding research philosophy. *Marketing Review, 4*(4), 397.

Hosmer, L. T. (2008). *The ethics of management* (6th ed.)*.* New York, NY: McGraw-Hill.

Igumbor, E.U., Sanders, D., Puoane, T.R., Tsolekile, L., Schwarz, C., Purdy, C., Swart, R., Durao, S. & Hawkes, C. (2012). "Big food", the consumer food environment, health, and the policy response in South Africa. PLoS Med, 9(7). e1001253; doi10.1371/journal.pmed.1001253.

International Food Policy Research Institute. (2015). *Global Nutrition Report 2015: actions and accountability to advance nutrition and sustainable development*. Washington, DC: Author.

Jacques, T. S., & Sebire, N. J. (2010). The impact of article titles on citation hits: An analysis of general and specialist medical journals. *J R Soc Med Sh Rep*, *1*, 2.

James, N., & Busher, H. (2006). Credibility, authenticity and voice: dilemmas in online interviewing. *Qualitative Research 6*(3), 403-420.

Jansen, J. (2004). An introduction to education theory. In I. Eloff, & L. Ebersöhn (Eds.). *Keys to educational psychology* (pp. 374-386). Cape Town: UCT Press.

Jarvis, M. (2000). *Theoretical perspectives in psychology*. London: Routledge.

Jernigan, V. B. B., & Jacob, T. (2015). The adaptation and implementation of a community-based participatory research curriculum to build tribal research capacity. *American Journal of Public Health*, *105*(3), 424-432. Retrieved from: http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2006.093641

Jewitt, C. (2012). *An introduction to using video for research*. (Unpublished NCRM working paper).

Kellert, S. R. (2002). Experiencing nature: Affective, cognitive, and evaluative development. In P. Kahn, & S. Kellert (Eds.). *Children and nature: Psychological, sociocultural, and evolutionary investigations*. Cambridge: MIT Press.

Kolb, D. A. (2014). *Experiential learning experience as the source of learning and development* (2nd ed.). New Jersey, USA: Pearson Education.

Kolb, D. A. (1999). *Experiential learning experience as the source of learning and development.* New Jersey, USA: Pearson Education.

Kolb, D. A., & Kolb, A. Y. (2005). *The Kolb learning style inventory - version 3.1.* Case Western Reserve University. Retrieved from: http://www.whitewater-rescue.com/support/pagepics/lsitechmanual.pdf.

Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhances experiential learning in higher education. *Academy of Management Learning & Education, 4*(2): 193-212. Retrieved from: http://www.jstor.org/stable/40214287.

Korinek, L., Walther-Thomas, C., McLaughlin, V. L., & Williams, B. T. (1999). Creating classroom communities and networks for student support. *Intervention in School and Clinic, 35*, 3–8.

Kraai, N. (2013). *Women and youth in agriculture cooperative (WAYCO). National Development Agency Project. Case study, September 2013*. SA: Department of Social Development.

Kraai, N. (2012). *Custoda ECD Trust. National Development Agency Project. Case study, September 2012*. SA: Department of Social Development.

Lander, M. (2013). *School garden programs and food security*. Pulitzer Center. Retrieved from: http://pulitzercenter.org/education/school-garden-programs-and-food-security.

LeGreco, M., & Canary, H. E. (2011). Enacting sustainable school-based health initiatives: A communication-cantered approach to policy and practice. *American Journal of Public Health, 101*(3), 431-437. Retrieved from: http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2006.093641.

Lehohla, P. (2014). *Poverty trends in South Africa: An examination of absolute poverty between 2006 and 2011*. Pretoria: Statistics South Africa.

Lekies, K. S., & Sheavly, M. E. (2007). Fostering children's interest in gardening. *Applied Environmental Education and Communication*, *6*(1), 67-75. doi: 10.1080/15330150701319362.

Leveritt, M., Ball, L., & Desbrow, J. (2013). Students' perceptions of an experiential learning activity designed to develop knowledge of food and food preparation methods. *Journal of Food Science, 12*(3), 56-60.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. London: Sage.

Lineberger, S. E., & Zajicek, J. M. (2000). School gardens: Can a hands-on teaching tools affect students' attitudes and behaviors regarding fruit and vegetables? *Hort-Technology*, *10*(3), 593-597.

Loynes, C. (2000). The values of life and living: after all, life is right in any case. In P. Barnes (Ed.). *Values and outdoor learning*. Association for Outdoor Learning: Penrith, Cumbria.

Mabie, R., & Baker, M. (1996). A comparison of experiential instructional strategies upon the science process skills of urban elementary youth. *Journal of Agricultural Education, 37*(2), 1-7.

Mampane, M. R. (2010). *The relationship between resilience and school: A case study of middle-adolescents in township schools*. (Doctoral thesis). Pretoria: University of Pretoria. Retrieved from: http://upetd.up.ac.za/thesis/available/etd-10072010-115253 / >.

Maree, K., & Pietersen, J. (2007). Sampling. In K. Maree (Ed.). *First steps in research* (pp. 171-181). Pretoria: Van Schaik.

Maree, K., & Van der Westhuizen, C. (2010). Qualitative research designs and data gathering techniques. In K. Maree (Ed.). *First steps in research* (pp. 24-45). Pretoria: Van Schaik.

Marshall, C., & Rossman, G. B. (1999). *Designing qualitative research*. Thousand Oaks, CA: Sage.

Markus, H. & Wurf, E. (1987). The dynamic self-concept. A social psychological perspective. *Annual Review of Psychology, 38*, 299-337. Retrived from: http://bern.library.nenu.edu.cn/upload/soft/001/37-02-01.pdf.

May, J., Sulla, V., & Zikhali, P. (2016). *South African poverty and inequality assessment note (for discussion only)*. The World Bank.

McClure, R. D. (2002). *Common data collection strategies effective in qualitative studies using action research in technical/operational training programs*. Retrieved from: http://evokedevelopment.com/uploads/blog/commonData.pdf.

Mchiza, Z. J. (2008). Factors associated with obesity in South African mothers and their pre-adolescent daughters: A cross-cultural validation and comparison study. (PhD thesis). Cape Town: University of Cape Town.

McNamara, C. (1999). *General Guidelines for Conducting Interviews*. (PhD thesis). Minnesota: University of Minnesota.

Merriam, S. B. (2009). *Qualitative research and case study applications in education.* San Francisco, CA: Jossey-Bass.

Merriam, S. B. (1998). *Qualitative research and case study applications in education*, San Francisco: Jossey-Bass.

Mertens, D. M. (2005). *Quality criteria in qualitative research*. Retrieved from: http://addingvalue.wceruw.org/Conferences/Meeting%205/Quality_Criteria_in_Qualitative_Research.pdf.

Mertens, D. M. (1998). *Research methods in education and psychology: integrating diversity with quantitative & qualitative approaches*. Michigan: Sage.

Miller, D. L. (2007). The seeds of learning: Young children develop important skills through their gardening activities at a Midwestern early education program. *Applied Environmental Education and Communication*, 6, 49-66.

Morley-Warner, T. (2000). *Academic writing is … A guide to writing in a university context*. Sydney: Centre for Research and Education in the Arts.

Mouton, J. (2001). *How to succeed in your master's and doctoral studies.* Pretoria: Van Schaik.

Naidu, A. (2016). *Curriculum enrichment, teaching and assessment: A three-legged stool*. Retrieved from: http://www.directions.usp.ac.fj/collect/direct/index/assoc/D770142.dir/doc.pdf.

Navarro, A. M., Voetsch, K. P., Liburd, L. C., Giles, H. W., & Collins, J. L. (2007). Charting the future of community health promotion: recommendations from the National Expert Panel on Community Health Promotion. *Prev Chronic Dis* [serial online] 2007 Jul [*date cited*]. Available from: http://www.cdc.gov/pcd/issues/2007/jul/07_0013.htm.

Nelson, A. M. (1998). Addressing the threat of evidence-based practice to qualitative inquiry through increasing attention to quality: a discussion paper. *International Journal of Nursing Studies 2008*, *45*, 316-322. http://www.ncbi.nlm.nih.gov/pubmed/17362956.

Neuman, W. L. (2006). *Social research methods: Qualitative and quantitative approaches* (6th ed.). Boston: Pearson.

Nieuwenhuis, F. J. (Ed.). (2007). *Growing values and human rights.* Pretoria: Van Schaik.

Newman, J. M. (2001). *A facilitators' guide to participatory workshops with NGOs/CBOs responding to HIV/AIDS*. International HIV/AIDS Alliance. Retrieved from: http://www.lupinworks.com/roche/workshops/1-understanding.php.

Nieuwenhuis, F. J. (2010). Qualitative research designs and data gathering techniques. In K. Maree (Ed.). *First steps in research (*pp. 124-141). Pretoria, South Africa: Van Schaik.

Noble, M., Barnes, H., Wright, G., & Roberts, B. (2010). Small area indices of multiple deprivation in South Africa. *Social Indicators Research*, *95*(2), 281-297. Retrieved from: http://www.jstor.org/stable/40542291.

Oldewage-Theron, W. H., & Egal, A. A. (2010). Nutrition knowledge and nutritional status of primary school children in QwaQwa. *South African Journal of Clinical Nutrition*, *23*(3), 149-154.

Ottawa Charter for Health Promotion. (1986). *Health promotion, 1*(4), iii-v.

Ozer, E. J. (2007). The effects of school gardens on learners and schools: Conceptualization and considerations for maximizing healthy development. *Health Education and Behaviour*, *34*(6), 846-863. doi: 10.1177/1090198106289002.

Palinkas, L. A., Green, C. A., Wisdom, J. P., & Hoagwood, K. E. (2013). *Purposeful sampling for qualitative data collection and analysis in mixed method implementation research.* Research Gate. Retrieved from: https://www.researchgate.net/publication/258315317_Purposeful_Sampling_for_Qualitative_Data_Collection_and_Analysis_in_Mixed_Method_Implementation_R.

Palys, T. (2008). Purposive sampling. In L. M. Given (Ed.). *The Sage Encyclopedia of Qualitative Research Methods* (Vol. 2, pp. 697-698). Los Angeles: Sage.

Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage.

Pedler, M. (1991). *The learning company. A strategy for sustainable development.* London: McGraw-Hill.

Peräkylä, A. (1993). Reliability and validity in research based on tapes and transcripts. In D. Silverman (Ed.). *Qualitative research: Theory, method and practice* (pp. 201-220). London, UK: Sage.

Pérez-Rodrigo, C., & Aranceta, J. (2001). School-based nutrition education: lessons learned and new perspectives. *Public Health Nutrition*, *4*(1A), 131-139.

Potter, A., Whitener, A., & Sikorsky, J. (2015, October 19). *The benefits of experiential learning* [Blog post]. Retrieved from: https://www.envisionexperience.com/blog/the-benefits-of-experiential-learning.

Pretorius, W. (2016). *News24 63% of young SA children live in poverty – study*. Retrieved from: http://www.news24.com/SouthAfrica/News/63-of-young-sa-children-live-in-poverty-study.

Rahm, J. (2002). Emergent learning opportunities in an inner-city youth gardening program. *Journal of Research in Science Teaching, 39*(2), 164-184. doi: 10.1002/tea.10015.

Rosman, G., & Rallis, S. F. (2003). *Learning in the field: An introduction to qualitative research*. Thousand Oaks: Sage.

Rossiter, M., Glanville, T., Taylor, J., & Blum, I. (2007). School food practices of prospective teachers. *Journal of School Health*, *77*(10), 694-700.

Schaps, E., & Solomon, D. (1990). Schools and classrooms as caring communities. *Educational Leadership, 48*, 38–42.

Schwartz, D. (1989). Visual ethnography: Using photography in qualitative research. *Qualitative Sociology, 12*(1). Minnesota, USA: University of Minnesota.

Seale, C. F. (1999). *The quality of qualitative research*. London: Sage.

Shenton, A. K. (2004*). Strategies for ensuring trustworthiness in qualitative research projects.* Newcastle upon Tyne, UK: Northumbria University.

Silverman, D. (2013). *Doing qualitative research* (4th ed.). London: Sage.

Silverman, D. (2001). *Interpreting qualitative data: Methods for analysing talk, text and interaction* (2nd ed.). London: Sage.

Sproule, L., McGuinness, C., Trew, K., Rafferty, H., Walsh, G., Sheehy, N., & O'Neill, B. (2005). *The Early Years Enriched Curriculum Evaluation Project (EYECEP), final report phase 1 (end of fourth year) executive summary*. Belfast: School of Psychology at Queen's University*.

Sproule, L., Trew, K., Rafferty, H., Walsh, G., McGuinness, C., & Sheehy, N. (2001). *The Early Years Enriched Curriculum Evaluation Project: first year report.* Report

produced privately for Northern Ireland Council for curriculum examinations and assessment (CCEA).

Sproule, L., Trew, K., Rafferty, H., Walsh, G., McGuinness, C., Sheehy, N., & O'Neill, B. (2002). *The Early Years Enriched Curriculum Evaluation Project: second year report.* Report produced privately for Northern Ireland Council for curriculum examinations and assessment (CCEA).

Sproule, L., Trew, K., Rafferty, H., Walsh, G., McGuinness, C., Sheehy, N., & O'Neill, B. (2003) *The Early Years Enriched Curriculum Evaluation Project: Rationale for the research design.* Report produced privately for Northern Ireland Council for curriculum examinations and assessment (CCEA).

Stake, R. E. (1995). *The art of case study research*. London: Sage.

Statistics South Africa. (2000). *Measuring poverty in South Africa*. Pretoria: Statistics South Africa.

Staunæs, D., & Søndergaard, D. (2008). Who is ready for the results? Reflections on the multivoicedness of useful research. *International Journal of Qualitative Studies in Education*, *21*(1), 3-18.

Stephan, A. (2016). *Food forward SA*. Retrieved from: http://www.foodbanksa.org/news/new-name-new-look-same-goal/.

Steyn, N. P., Lambert, E. V., Parker, W., Mchiza, Z., & De Villiers, A. (2009). A review of school nutrition interventions, globally as an evidence base for the development of the HealthKick programme in the Western Cape, South Africa. *South African Journal of Clinical Nutrition*, *22*(3), 145-152.

Stringer, E. T. (2004). *Action research in education*. Upper Saddle River, NJ: Pearson.

Student well-being team. (2006). *Catholic Education Office Melbourne*. Australia: Snap Printing.

Sulkowski, M. L., & Joyce-Beaulieu, D. K. (2014). School-based service delivery for homeless students: Relevant laws and overcoming access barriers. *American Journal of Orthopsychiatry*, *84*(6), 711-719. doi: 10.1037/ort0000033.

Suzuki, L. A., Ahluwalia, M. K., Arora, A. K., & Mattis, J. S. (2007). The pond you fish in determines the fish you catch: Exploring strategies for qualitative data generation. *The Counselling Psychologist, 35*, 295. doi: 10.1177/0011000006290983.

Taylor, S. E. (2009). *Health psychology*. Los Angeles, CA: McGraw-Hill Higher Education.

Terre Blanche, M., Durrheim, K., & Painter, D. (2006). *Research in practice: Applied methods for the social sciences.* Cape Town: UCT Press.

Thompson, C. J. (2004). Marketplace mythology and discourses of power. *Journal of Consumer Research, 31*(June), 162–80.

United Nations. (2015). *Transforming our world: the 2030 agenda for sustainable development*.

United Nations. (2006). *The Millennium Development Goals Report: 2006*. United Nations Development Programme. Retrieved from: www.undp.org/publications/MDGReport2006.pdf.

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences*, *15*, 398-405.

Waliczek, T. M., Bradley, R. D., & Zajicek, J. M. (2001). The effect of school gardens on children's interpersonal relationships and attitudes toward school. *HortTechnology, 11*(3), 466-468.

WeCanChangeOurWorld. (2011). *Woolworths and FTFAs evolving EduPlant model has a finger on the pulse of sustainable adaption*. Retrieved from: http://www.trees.co.za/evolving-eduplant-model-has-a-finger-on-the-pulse-of-sustainable-adaption.html.

Welsh, E. (2002). Dealing with Data: Using NVivo in the qualitative data analysis process. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, *3*(2). Retrieved from: http://www.qualitative-research.net/index.php/fqs/article/view/865/1881.

Whyte, W. F. (1991). *Participatory action research*. Newbury Park: Sage.

World Bank. (2016). *Africa fiscal year review 2016*. Washington, DC: World Bank.

Yin, R. K. (2009). *Case study research: Design and methods*. Location: Sage. Retrieved from: http://books.google.co.za/books?id=FzawIAdilHkC&source=gbs_navlinks_s.

Yin, R. K. (1989). *Case study research: design and methods*. Newbury Park: Sage.