

**AN EXPLORATION OF THE SCHOOL NUTRITION
PROGRAMME'S POTENTIAL TO CATALYSE
COMMUNITY-BASED ENVIRONMENTAL LEARNING:**

**A CASE STUDY OF A RURAL EASTERN CAPE
SCHOOL**

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VELISWA TSHABENI

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ABSTRACT

The purpose of this study was to explore the extent to which a School Nutrition Programme can catalyse community-based environmental learning and promote food security in the school and the community. This is an interpretive case study of a junior secondary school in the rural Eastern Cape province of South Africa. The school is located in an area characterised by high levels of poverty and under-nutrition. The school's food garden, a central focus of this study, contributes to the School Nutrition Programme, which falls under the National School Nutrition Programme (NSNP). The aim of the NSNP is to alleviate poverty in public schools.

This case study was conducted by means of questionnaires, semi-structured interviews, and document analysis and field observations. The data set was analysed, firstly, to ascertain if the School Nutrition Programme functions as a community of practise (Wenger, 1998). Thereafter, the data set was analysed to identify the knowledge related to food security and environmental sustainability that is learned and shared in the School Nutrition Programme, and also how such learning took place.

The study found that the School's Nutrition Programme was indeed operating as a community of practice and that it created a platform for sharing explicit and tacit knowledge and skills related to food security and environmental sustainability. The case study also revealed the contextual and experience-based nature of knowledge related to food cultivation.

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DEDICATION

I dedicate this thesis to my late dad, Dumile, the man who used to encourage me to be who I am. I am sure he would have been very proud of his daughter. And to the late family friend, Makhaya Carlos Gqala “boy”: I have made it.

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LIST OF ABBREVIATIONS AND ACRONYMS

CoP:	Community of Practice
DoBE:	Department of Basic Education
HIV/AIDS:	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
INP:	Integrated Nutrition Programme
JSS:	Junior Secondary School
NSNP:	National School Nutrition Programme
PSNP:	Primary School Nutrition Programme
SNP:	School Nutrition Programme
UN:	United Nations
UNICEF:	United Nations Children's Fund
WFP:	World Food Programme

CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

This study focused on the School Nutrition Programme's potential to catalyse community-based environmental learning, a poverty alleviation strategy in South African public schools, can be extended to the surrounding communities for food security purposes. This national poverty alleviation strategy helps communities living in poverty to improve the quality of life and quality of education for school-going learners. The masters study reported here investigated how the School Nutrition Programme at Bushula's Junior Secondary School, the school where I teach, can further serve as a contribution towards enhancing community-based environmental learning, in particular learning about local food security and nutrition.

This first chapter of the study begins by scoping the context of poverty, poor quality education and food insecurity in the location where this study was conducted. Thereafter, it presents the study's broad aims, introduces the research site and the research question and goals, gives an overview of each chapter, and clarifies key concepts that will be used throughout the study (elaborated in Chapter Two).

1.2 BACKGROUND TO THE STUDY

The broad aim of this study was to improve the quality of life and the quality of education of learners at Bushula's Junior Secondary School, who are the victims of poverty. I therefore investigated the extent to which the knowledge produced by members of the School Nutrition Programme could be extended to the wider community in order to enhance community-based environmental learning.

As a Life Orientation teacher at Bushula's J.S.S, my interest was to witness all my learners make a success of their lives, but I understood that for this to happen they needed to experience a reasonable quality of life and receive good quality education. This is not the situation for the majority of learners at Bushula's J.S.S, because the school is located in a community with high levels of poverty. As a member of this community, I am aware that the community members are either unemployed or make a meagre living as street

vendors. Many households depend almost entirely on old age pensions and child support grants for survival, and most households live below the poverty line. This situation, exacerbated by high levels of HIV/AIDS infection, a high mortality rate and orphaned children, creates high levels of vulnerability for the children living in these homes. A number of learners go to school on empty stomachs and some of them drop out of school to fend for their families.

This situation is not unique to Bushula's J.S.S but is widespread throughout South Africa. In response, the National Department of Education initiated the National School Nutrition Programme (NSNP) in 2003 whose objectives are as follows:

- Contribute to the improvement of the quality of education by enhancing primary school children's active learning capacity, their school attendance and punctuality, through the temporary alleviation of hunger.
- Improve knowledge regarding nutrition and perceptions, attitudes and eating patterns amongst primary school children, their parents and teachers through education (either as part of the general education curriculum or through other primary school education feeding initiatives).
- Enhance broader development initiatives (DoE, 2009).

After witnessing the significant role of the School Nutrition Programme at my school and noting how food gardens contributed to the sustainability and success of the programme, I became interested in exploring the extent to which the benefits of the School Nutrition Programme could be extended to the local community through sharing the knowledge acquired by the School Nutrition Programme members. I wondered about the extent to which the knowledge and skills produced and shared within the School Nutrition Programme's Community of Practice could be extended to the community for improved food security.

1.3 RESEARCH SITE

This study was conducted at Bushula's J.S.S, one of many junior secondary schools in Lusikisiki, in the Eastern Cape Province. Lusikisiki is a village that falls under Ngquza Hill local Municipality. This town is 45 km north of Port St. Johns, in Eastern Pondoland.

It developed from a British military camp established in 1894, surveyed in 1902 and administered by a village management board since 1932. The name 'Lusikisiki' is onomatopoeic, derived from the rustling sound of reeds in the wind (Raper, 2011).

The South African map below shows the nine provinces of the country, but the focus is in Lusikisiki, a very small village in Eastern Cape Province where the research site, which is Bushula's Junior Secondary school, is located.



Figure 1. 1 South African map showing the Province of Eastern Cape (sourced from Eastern Cape Tourism Board, 2009)

Bushula's Junior Secondary School was established by the Methodist Church of Southern Africa in 1921. It started off as a primary school and was named after Bushula, the local headman at that time. The school is 16 kilometres away from Lusikisiki. Today, Bushula's Junior Secondary School is a government-aided school that supports the needs of approximately 500 learners from Grade R-9. The school employs 16 educators, who make use of 12 classrooms. Bushula's J.S.S has been declared a no-fee school and fully depends on government subsidies. The school does not have a science laboratory, computer laboratory or library. It has a sick-bay, currently known as a wellness room, which also functions as a counselling centre run by the care-giver, who is also known as the Learner Support Agent (LSA).

The school initiated a School Nutrition Programme in 1996 in an effort to alleviate poverty at school and in the surrounding community, where unemployment levels are high. In 2011, the school re-initiated its food garden to sustain the School Nutrition Programme. This is not the first food garden at the school; the first one was initiated in the 1980s to cater for the practical component of Agricultural Science. However, as Agricultural Science was phased out as a stand-alone subject at school in the late 1990s, in line with the national curriculum reforms, the food garden became neglected. Since its revival in 2011, the food garden produces a very high yield; surplus produce is sold, or given, to under-privileged learners.

1.4 RESEARCH QUESTION AND GOALS

The research question to which this study responds is: ‘To what extent can the School Nutrition Programme be used as a catalyst for community-based environmental learning for enhanced food security’?

Research sub-questions:

- How is the schools’ School Nutrition Programme operating as a Community of Practice?
- What kind of knowledge related to environmental learning and food security is produced and shared in this Community of Practice?
- What skills relevant to environmental learning and food security are developed and shared in this Community of Practice?
- How is learning to support food security taking place in this Community Practice?

1.5 OVERVIEW OF SUBSEQUENT CHAPTERS

Chapter 2: Literature review

This chapter reviews literature relevant to the contextual, conceptual and theoretical aspects of this study. The chapter profiles the School Nutrition Programme both as a national programme and specifically at Bushula’s J.S.S, which is the research site. The study’s theoretical frameworks of social constructivism, social learning theory and communities of practice are also outlined in the chapter.

Chapter 3: Research methodology

Chapter 3 discusses the role of social constructivism in the research study. It also gives a justification for selecting Bushula's J.S.S as the case study site, and the data generation methods chosen. The chapter also discusses the research design decisions made, how qualitative data was managed and subsequently analysed. This chapter also describes measures taken to strengthen the validity of the study and describes the ethical dimensions of the research methodology.

Chapter 4: Reporting and analysing the research cycles

Chapter 4 presents the data that was generated in this study in three phases. Phase one of the study aimed at finding out if Bushula's School Nutrition Programme operates as a Community of Practice, as described by Wenger (1998). Phase two describes the knowledge and skills learnt, produced and shared in the school's Community of Practice. Phase three looks at what, and how, the community members learned through their involvement in the School Nutrition Programme's Community of Practice.

Chapter 5: Discussion of research findings

This chapter draws on a range of theoretical work to present, and discuss, the research findings based on the data presented in chapter 4, with the aim of obtaining a deeper insight into the case of Bushula's Junior Secondary School's Nutrition Programme. The focus here is on responding to the study's research question: "To what extent can the School Nutrition Programme be used as a catalyst for community-based environmental learning for enhanced food security?"

Chapter 6: Conclusion and recommendations

The chapter presents a reflection on the research process and a concluding summary of the study. It outlines what I have learnt from the study and how it helped me to understand the implications of using the School Nutrition Programme, which was to introduce some strategies to help people respond better to poverty at Bushula's J.S.S and to enhance community-based environmental learning. Lastly, it makes recommendations within the case context of the school.

1.6 CLARIFICATION OF KEY CONCEPTS USED IN THIS STUDY

Various concepts are used in this study and in its research question that are often contested. Therefore, in this section I introduce these key concepts as I will be using them in the study. These basic definitions will be drawn upon and elaborated on in the following chapter, which reviews literature relevant to the study.

1.6.1 Social-ecological

The term ‘social-ecological’ refers to the environmental issues that have a social and ecological dimension to them. These cannot be separately analysed because they are so interlinked. Bookchin, Purchase, Morris, Aitchey, Hart and Wilbert (1993) define social ecology as the science of relationships between humans and community and their environments. They add that humans, far from being ‘unnatural’, are an expression of a deep natural process and that human consciousness is a result of nature striving for increasing complexity and awareness. Bookchin (2004) adds that social ecology supports a plan to reconstruct and transform an outlook on social and environmental issues. Social ecology envisions a moral economy that brings together human communities with the natural world. He further emphasises the complexity of relationships between people and nature along with the importance of establishing more mutualistic social structures.

1.6.2 Poverty alleviation

According to the World Bank’s (2001) report, poverty can be simply put as a formally declared deprivation of well-being, which relates to the lack of education and health. It is further noted that poverty-stricken people have no opportunity to voice their opinions and are powerless. Poverty alleviation, therefore, is the effort aimed at reducing the magnitude of poverty. Ekweruke (2005) further extends on the ways in which poverty can be alleviated. He suggests the need to increase the availability of basic human needs, or disposable income, as it is needed to provide for the basic needs such as clean water, food, shelter and education needs.

1.6.3 Catalyst

This study is interested in investigating how a school’s nutrition programme can serve as a catalyst for community-based environmental learning and enhanced food security. A catalyst is a substance that increases the rate of a chemical reaction or something that

makes a change happen or bring about an event. It is something that provides an alternative route for a reaction to occur, either by allowing the reaction to occur at a different transition state or by changing the activation energy.

1.7 CONCLUSION

This chapter has introduced the study's context, research question and goals. It has also provided a platform to introduce myself as researcher, and to explain how my interest in conducting the research came about. The following chapter will provide a more in-depth discussion of many aspects that have been introduced here, such as the history and current operation of the national School Nutrition Programme, and the relationships between poverty, malnutrition, food gardens and education. Chapter Two will also present a theoretically based discussion of how social learning occurs in a community of practice, as this is one of the central concerns of this study.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, I begin by discussing the challenges of rural education in South Africa. The focus is on the Eastern Cape Province, where this research was conducted. The chapter reviews the impact of poverty and malnutrition in Eastern Cape schools and communities, before exploring school-community links as one possible strategy to respond to the challenges of poverty.

The second part of the chapter introduces the theoretical framework of this study. I first describe the study's social constructivist orientation (see section 2.8) before introducing Wenger's (1998) theory of Communities of Practice (see section 2.9). Finally, in section 2.10, I discuss Social Learning theory in relation to environment-oriented learning in a community of practice.

2.2 RURAL EDUCATION IN THE CONTEXT OF POVERTY AND MALNUTRITION

2.2.1 Defining poverty

Being poor, as defined by the United Nations (2011), is a denial of choices, opportunities and a violation of human dignity. It means not having enough food and clothing, or not having the land on which to grow one's food, or a job to earn a living. But for poor people, poverty is more than this. People are particularly vulnerable to adverse events outside their control. They are often treated badly by the institutions of state and society and excluded from voice and power in those institutions. This is echoed by Barbarin and Richter (2001), who suggest that poverty in the South African context generally means being unemployed, without any kind of support or where the families depend on grandparents' government grants or nothing at all. Landsberg (2006) adds that poverty in the South African educational context manifests in adverse factors such as ill-health, and that poverty and malnutrition cannot be separated because malnutrition is one of the consequences of poverty.

According to Statistics South Africa (2010/2011), during the September 2010 to August 2011 survey, approximately 20.2% of the population was living below the food poverty line, while roughly 10.2 million people were living below the lower-bound poverty line. Among the provinces in South Africa, Eastern Cape Province has the highest poverty rates. Below is a brief overview of the effects of poverty in schools and communities in South Africa.

2.2.2 The effects of poverty in schools and communities

Donald, Lazarus and Lolwana (2006), explain that children living in a context of poverty are much more prone to health risks associated with malnutrition, diseases, infections and injuries than those who do not live in poverty. This explanation is supported by StatsSA (2012), which states that in 2012 an estimated 4.1 million children were living with HIV in South Africa, while over 2.5 million had been orphaned by this disease. In 2014, South Africa was found to have 5.51 million people living with HIV and a percentage of 31, 1% who had passed on due to this pandemic.

Donald et al. (2006), further consider poverty cycles and their effects as social issues. People, for example, who suffer from poverty, are at high risk of infectious diseases like tuberculosis. Smit (2009) adds that unemployment is one of the issues that leads to crime and that it can influence community members who are the victims of poverty to be murderers, gangsters and prisoners. He assumes that unemployed people are often involved in substance abuse (alcohol and drugs), physical abuse of women, children and elderly people, and that these various forms of abuse result in emotional abuse which, in my experience as an educator in the rural Eastern Cape, is a barrier to learning in our schools.

Smit (2009) adds that in South Africa, three children in every five live in poor households and that leads to crime. These children are vulnerable to violence of many kinds such as sexual abuse and rape, fractured and unstable families and alcohol abuse by parents. As a result the home is not a safe place for children. Some children leave school earlier than they should, some have to go to work in order to look after their siblings and some girls become pregnant and drop out of school. Those children who remain in school may have trouble concentrating in the classroom due to hunger and malnutrition.

For the reasons stated above, the South African government has, over several decades pre- and post-democracy, initiated different interventions to alleviate poverty in schools and communities. One common form of state intervention has been the feeding programmes to reduce malnutrition associated with poverty through improved diets in schools. These strategies included national school feeding programmes and an Integrated Nutrition Project, which were suggested by a committee appointed by the Minister of Health in 1994, immediately after the transition to a democratic government.

The following section gives a more detailed account of the National School Nutrition Programme with regard to its history, objectives and the legislative framework underpinning the implementation of the programme.

2.3 THE SCHOOL NUTRITION PROGRAMME AS A POVERTY ALLEVIATION STRATEGY

2.3.1 History of the School Nutrition Programme

South Africa's Primary School Nutrition Programme, commonly known as National School Nutrition Programme, was introduced on a national scale in South Africa in 1994, following President Nelson Mandela's "State of the Nation Address" in which he declared that a nutrition feeding scheme would be implemented in every primary school where such a need existed. This plan formed part of the Integrated Nutrition Programme of South Africa. It was implemented by the National Department of Health and managed at the provincial level by the nine provincial Departments of Health. Geographic areas where poverty levels are highest are targeted, and priority is given to rural and farm schools and schools serving informal settlements. The main purpose of the Primary School Nutrition Programme is to contribute to the improvement of education quality and general health by enhancing active learning capacity, alleviating short-term hunger, improving school attendance and punctuality, and addressing micronutrient deficiencies. According to the Department of Education (2006), the programme is evaluated and monitored on an ongoing basis.

The National School Nutrition Programme was introduced as one of the Presidential Leading Projects under the Reconstruction and Development Programme (RDP) to alleviate poverty in disadvantaged schools. In 2002 it was transferred to the Department

of Education and was also extended to secondary schools in 2009. The School Nutrition Programme alleviates poverty as an ethical, social, and environmental imperative. Schools and the Department of Health's records reported that the numbers of learners who are out of school because of sicknesses associated with poverty had decreased (Health Advisory Committee Report at school, 2011). According to the Department of Education (2006; 2008) the programme's implementation was monitored and evaluated by the School Governing Bodies, and they were mandated by the programme's guidelines. An earlier document (DoBE, 2006) suggested the use of standardised menus in schools to improve diet in public schools. Women from surrounding communities volunteered to prepare meals for a monthly stipend of R680.00 (as at November 2012). The number of the food handlers in each school was determined by the number of learners, on the ratio of one food handler to 200 learners.

The above organisations reported that the School Nutrition Programme had helped many families, especially those learners that could not have breakfast before going to school. Based on this report, I reason that the School Nutrition Programme may have had an influence on improving school enrolment, especially in disadvantaged communities. For example, in my school, the admission book showed an annual increase in school enrolment since the introduction of the School Nutrition Programme. As stated by the Department of Education (South Africa, 2006) approximately 5 million children in 15,000 primary schools were fed annually by this programme. Although the School Nutrition Programme may have had an impact on all the relevant schools, my case study was based on the programme in Bushula's Junior Secondary School.

2.3.2 Legislative framework underpinning the National School Nutrition Programme

In accordance with the objectives of the National School Nutrition Programme (DoBE, 2009) described in 1.2 above, the National School Nutrition Programme is regulated by the following legislation and strategic frameworks.

- Section 27 (1) and Section 28 (c) of the Bill of Rights in the South African Constitution (RSA, 1996) states that “everyone has the right to have access to sufficient food, shelter, basic health care and water. The state must take reasonable legislative and other measures, within its available resources to achieve the progressive realisation of each of these rights”.

- According to Abrahams & Matthews (2011) the United Nation's Convention on the Rights of Children declaration (1996) provides time-bound and measurable goals and targets for combating poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women and children.
- The South African Social Security Agency (SASSA) (2005) also provides for a food security grant, which allocates food parcels to the most vulnerable children in order to alleviate poverty.

According to the African National Congress policy framework (1994) the Reconstruction and Development Programme (RDP) of (1994), currently known as the Accelerated and Shared Growth Initiative of South Africa (AsgiSA), which was renamed in 2004) identified food security as a priority policy objective. As a result, Government prioritised its budget to focus on improving the food security conditions of historically disadvantaged people. AsgiSA is a programme developed to replace the Reconstruction and Development Programme and whose aims relate closely to those of the RDP because both programmes aimed at reducing poverty by targeting the disadvantaged youth. AsgiSA has a direct positive impact on learners who are not yet able to benefit directly from the country's economic advances. The implementation of the National School Nutrition Programme encouraged schools to start their own food gardens to reinforce the programme.

2.3.3 The role of food gardens in poverty alleviation in rural Eastern Cape schools and communities

Mason (2003) defined food gardens as gardens that produce fruits and vegetables. Marsh (1998), added that food gardening contributes to food security because it provides many homes with direct access to fresh food that can be harvested, prepared and consumed by people. Marsh further stated that food gardens not only feed school children and community members but have the ability to strengthen the community's knowledge and skills in food production and nutrition.

The Food and Agriculture Organization (2010) stated that the roles of food gardens in schools and communities are to:

- Increase the relevance and quality of children's education by introducing them to food and nutrition-related knowledge and skills.

- Provide children and the wider community with practical experience in gardening.
- Introduce innovations and techniques that can be applied at home to their own food gardens or farms.
- Improve learner's nutrition by supplementing school feeding programmes with fresh food products.
- Improving education levels through enhancing food and nutrition security and state of living in the community.

UNICEF (2007) stated similarly that food gardens aim to provide food security in schools and communities as well as encourage communal awareness. Food gardens are for nutritional value but can also be promoted for their income-generating efforts, especially if organised in communities (Bentley, Auger, Haurigah, Bailey, Ellison & Jeniko, 1999). This provides evidence that food gardens can strengthen the link between schools and communities. The value of such connections is discussed in the following section.

2.4 THE IMPORTANCE OF SCHOOL-COMMUNITY LINKS TO ALLEVIATE POVERTY AND MALNUTRITION

2.4.1 Community role in schools

School and community links are vital to the success of the national education system and to the success of individual learners. Sectors of the community that might be targeted for involvement are commercial farmers, non-governmental organisations and the corporate sector. School-linked food gardens can be another strategy to produce food for school meals, for example, community food production or home-grown school feeding programmes where farmers are paid to produce food for their local schools (FAO, 2010). For an example, four years ago at Bushula's J.S.S, the School Nutrition Programme committee used to order fresh vegetables from a local farmer in the community.

These community links were also reflected in an "imbizo" (meeting) of the Nelson Mandela Foundation (2005). During the open discussion with parents, the foundation referred to the reflection of community values in schools: that learners needed to show respect,, be responsible, work hard and have a sense of purpose in life, and that schools needed to reinforce and support these critical values to tighten the relationship between the school and the community. Communities, for example, could take responsibility for

school feeding programmes from the start to increase the likelihood of their success and sustainability. This is one of the reasons why my school involved parents in programmes such as the School Nutrition Programme.

In my school, where the study was conducted, we followed the structure as suggested by the Department of Education (2002) for operating the programme. The Department of Education (2002) suggested that the committee should consist of a school principal, School Nutrition Programme coordinator, educators, food handler, gardener, learner support agent (caregiver) and parent. The Department of Education (2006) also suggested the same structure but added that the School Nutrition Programme is the responsibility of every educator in schools. At Bushula's J.S.S, some adjustments were made to these recommendations for various reasons, such as the case of the school gardener; it is everyone's responsibility to help with the garden in order to save funds. It is in my understanding that knowledge can be shared as all of these individuals work together as a group in the operation of the School Nutrition Programme.

The Department of Education (2009) discussed in detail the structure of the School Nutrition Programme by recommending that it should include the School Principal, who is the Accounting Officer of his/ her school's School Nutrition Programme. The principal is responsible for the overall management and success of the programme. It is the duty of the principal to nominate the School Nutrition Programme Coordinator to assume operational responsibility for the programme. The duty of the coordinator is to supervise the day-to-day activities of the programme, including receiving and recording of stock, keeping updated records of all invoices, meals served and the number of learners served per day. It is one of the coordinator's responsibilities to ensure that all training workshops and meetings are attended. It is also stated that there must be a Nutrition Committee comprising of the School Nutrition Programme Coordinator, Administrator, School Management Team member, a School Governing Body (SGB) member, a food handler and a food gardener. The School Governing Body gives support in addressing any additional requirements of the programme and to ensure that the programme is implemented effectively, while food handlers are responsible for preparing and serving meals and for cleaning the kitchen. The literature above has shown the role of community links in improving the School Nutrition Programme, and the following section considers some strategies to ensure its sustainability.

2.5 SCHOOL NUTRITION PROGRAMME'S SUSTAINABILITY STRATEGIES

Sustainable Development depends on citizens who are literate and skilled, who are caring and informed decision-makers in all sectors and who can make the right choices (Pigozzi, 2007). He indicated the role played by education to address challenges such as poverty, wasteful consumption, urban decay, population growth, gender equity conflict and violation of human rights. He also mentioned that education for sustainable development promotes the same learning outcomes as quality education. The goal of education for sustainable development is to promote education for a more sustainable human society to develop awareness of the concept of sustainability.

Monroe (2007) also emphasised the importance of educating people about sustainability. He highlighted the importance of educating adults about sustainable development, noting that educators can do this very successfully as they can encourage social change by organising both parents and learners to form communities of practice.

Regarding sustainability, Shumba, Kasambe, Mukundu & Muzenda (2008) also added that, in a Community of Practice, sustainability concerns are commonly strongly influenced by economic, environmental, cultural and/or social factors, thereby bringing issues of poverty, risk and vulnerability to the fore. The community members therefore make a living through use of the activities, which can thereafter lead to environmental degradation that is likely to contribute to further vulnerability. The case study by Shumba et al (2008) presented the perspectives on sustainability, quality and relevance of education found in a resettlement community in Zimbabwe. It demonstrated the relevance of environmental education and education for sustainable development to the quality of formal education in the school community and to the quality of formal and informal education in the broader community context. In their discussion they argued that factors such as economic, cultural, social, environmental issues and poor quality of education may be contributing to the community's perspectives and practices which, in the context of poverty, may increase people's vulnerability. People in the community were affected by economic challenges, as a result of which they engaged in illegal practices. Shumba et al (2008) argued that a community affected by even one of the issues (economic, social,

socio-ecological, or cultural) is at risk as all have an impact on the quality of education and the quality of life. Factors such as poor school attendance, absenteeism, school drop-outs, diseases, orphans, prostitution, teenage pregnancy and poor housing commonly result from this. Mbingi & Maree (2004), cited in Shumba et al (2008) argued that in a society where there is no solidarity, there is loss of Ubuntu, which leads to an unsustainable lifestyle. These communities also lack collective effort to explore opportunities in order to resolve known problems such as poverty. They concluded that communities experiencing poverty and vulnerability additionally face sustainability challenges, resulting in tensions within the community, including the school.

Smit (2009) described poverty as something that occurs when people are regarded as poor because they lack the basic needs such as food, shelter, clothing and sanitation. It is the inability of individuals, households or entire communities to access sufficient food. Poverty is related to unemployment; even working people can be poor because the money they earn cannot be enough to maintain a sustainable living. Some circumstances contributing to poverty are: lack of desire to work people often accept their circumstances and give up easily on life; big families that put pressure on the breadwinners - the bigger the family, the higher the income needed; low wages, retrenchment and single parent families who have to take care of children as the father is no longer there to provide for them.

In my view, communities should be motivated to maintain their community gardens in response to the challenges that they are facing. Additionally, this may promote school attendance. Discussed below are the ways in which school-community links can be improved through the use of food gardens.

2.6 WAYS TO IMPROVE SCHOOL-COMMUNITY LINKS THROUGH FOOD GARDENS

Vandenbosch, Sambili, Tombo & Whitehead (2004) identified three learning environments: the school, home and community, noting that school-community linkages are very important to support social learning in education. They argued that, where principals, staff, students and community members work together to build a shared educational vision, schools are likely to be more successful in achieving their goals. The

shared vision helps everyone to feel being part of the school and increases the sense of shared responsibility for achieving the goals of the Nation School Nutrition Programme (see section 1.2). Schools that depend on their communities to organise and implement School Feeding Programmes offer certain advantages, which include increased contact with, and hence communication between, parents and teachers, officials and others. This gives parents opportunities to become more aware of what goes on at school, and raises the value of education for parents and the whole community.

The World Food Programme has supported school feeding programmes since 1978. In their report (World Food Programme, 1993), they referred to the importance of improving the school-community links. They stated that these feeding programmes had strong government and community support and were viewed as part of a necessary package of inputs for improving education. The programme was credited with helping to maintain high enrolment and attendance and encouraging community participation in education. School cooperatives supported the school canteens and parents' associations assisted with the transportation of food aid (World Food Programme, 1993).

In South Africa, home-grown or small scale production has been identified as a suitable contributor to food and nutrition security for the rural poor in the country. According to Labaclarios, Steyn and Maunder (2000), South Africa is one of the countries with a large population of people that have a low consumption of fruits and vegetables which results in them having a low number of micro-nutrients. Therefore a number of projects have been implemented as a solution to this deficiency.

According to the Food and Trees for Africa (2014) the EduPlant programme was implemented to help young kids learn how to plant fruits and vegetables and how to sell some of the produce to raise funds for the programme. This programme was developed by Food and Trees for Africa which is funded by the Woolworths Trust Fund and is sustained by the Department of Education. The programme's main objective is to help develop school food gardens to alleviate poverty and promote environmental education and sustainability of natural resources.

The Food and Agricultural Organization (2009) mentions that The World Declaration and Plan of Action for Nutrition promotes the use of locally available nutrient rich indigenous

and traditional foods as a critical strategy against foods as a strategy to counter food and nutrition insecurity. In 2004, the Department of Education implemented a programme called Sustainable Food Production in Schools (SNFP), which promotes the implementation of sustainable food production initiatives in order to transfer skills to learners and community members to improve household food security, and by 2007/2008 a total number of 6503 schools had school-based food gardens (RSA, DoE, 2008). In Lusikisiki, the town where this study was conducted, a project was initiated to grow potatoes which is known as the Lusikisiki Project and through that project many community members obtained training in gardening activities.

The significance of school-community links are recognised internationally. According to the BBC (2007), in countries such as the United Kingdom, where the British community garden movement began in the late 1960's, many residents depended on community gardens for survival. Many of these community gardens transformed open sites into green spaces that included flower gardens and vegetable plots. As these community gardens evolved, the community members also used them as sites to discuss social and health problems. Community gardens in the United Kingdom generally achieved more than was expected: they provided fresh fruit and vegetables, a place for wildlife, improved play areas, an outdoor classroom and safe public spaces that were well-maintained. This was because they were managed by the local people working on a voluntary basis and these people were chosen by community members. According to the BBC (2007), there was also a women's organisation called Women's Environmental Network (WEN) in the UK, which aimed at encouraging other women to come out of their immediate family circles to garden with other people. These community gardens joined different cultures and generations together to improve the individual and community confidence and bridge the division between ethnic, political and socio-economic groups.

The *Architects Newspaper* (26 November 2013) also confirmed the role played by food gardens in improving the school-community links. This newspaper article stated that in New York, food gardens were initiated in 1996 by Alice Waters in Martin Luther King Jr. Middle School in Beverley. The parents and teachers wanted to use the garden to place the focus on obesity amongst the learners, to create an alternative source of nutrition for the poor and to reduce frequently fried lunches. It was named "The Edible School Yard". The success of this garden also led to the School Lunch initiative and

resulted in nutritious lunches and garden experiences. Students at the school learned about healthy food and exercise and were encouraged to take their knowledge home to help change their families eating habits.

So far in this chapter, I have outlined the National School Nutrition Programme in South Africa, and similar initiatives in other countries, drawing attention to the significance of school-community links in relieving hunger and malnutrition, one of the main consequences of poverty. In the following section, I discuss people-nature relationships in relation to local food production and poverty alleviation.

2.7 ENVIRONMENTAL KNOWLEDGE AND PEOPLE-NATURE RELATIONSHIPS

This section focuses on people's knowledge of nature, people-nature relationships, and what these mean for social-ecological sustainability. Human actions are often viewed as external drivers of ecosystem dynamics, such as polluting, agricultural production and fishing (Brand & Jax, 2007) and, while these actions have contributed considerably to a general increase in people's well-being and economic growth, humans have swiftly and substantially transformed the planet's ecosystems over the past 50 years. According to the Millennium Ecosystem Assessment (MA, 2005), this is in order to satisfy the increasing demand for homes, food, water and consumer goods.

The report of the Millennium Ecosystem Assessment (MA, 2005) illustrated the close links between human well-being and natural ecosystems. The global report noted that "the human species, while buffered against environmental immediacies by culture and technology, is ultimately fully dependent on the flow of ecosystem services" (MA, 2005, p. 1). Dold & Cocks (2012) similarly emphasised the importance of people-nature relationships but their focus was on the people living in the rural Eastern Cape of South Africa. The findings of their study showed the relationship between people, culture and nature, which is evident in how the amaXhosa, living in the rural Eastern Cape, use forests for different rituals and traditions. In the Xhosa culture there are two types of diviners: water diviners and forest diviners. The forest diviners use plants as a kind of medium of initiation and they thus have close and intimate connections to forests. Similarly, when Xhosa boys go to initiation school when they reach the age of eighteen

years, these schools are situated in forests as the boys have to hide from their family and the village people. Dold & Cock (2012) also explained that, when African people organise traditional rituals like the rituals mentioned above, they have to cook their food using firewood, which means that they have to go and collect wood from the forests.

Shava (1999) also identified the relationship between people and nature in the Eastern Cape in terms of food and nutrition. He stated that the amaXhosa people enjoy traditional foods such as *imifino* (wild, leafy vegetables), prepared according to recipes used by their ancestors. People collect these herbs from the forest and it is culturally preferable and common to mix these traditional foods in western dishes (Shava, 1999). According to Fox & Young (1982), traditional foods used by community members in rural areas were derived almost entirely from wild edible plants. Herbs such as *imifino* are not expensive as they are home grown, easy to prepare and healthy but are now rarely grown as people's lifestyles have become more modernised and westernised.

As mentioned above, many people in the Eastern Cape still depend on food gardening for their daily meals due to poverty. Nesamvumi (2000) added to this statement by explaining that in the rural areas of the Eastern Cape, people over many generations had relied on a broad food base, which included traditional plants. Bryceson & Shackleton (2001) added that poor communities also adopted a range of strategies, which included the consumption of, and trade in, natural resources. According to Lee (1979), Reynolds (1989), Rodin (1985), cited in Bryceson & Shackleton (2001), during periods of extreme food scarcity and droughts, many rural people relied on wild food plants as their major nutritional supply. But such practices are now slowly fading away as most local communities have come to regard traditional food as primitive and inferior. They rely, instead on a modern agriculture system, even though it is very expensive.

Based on these discussions about how people use land for farming in order to eat, it is clear that people need to sustain the land and its fertility. However, many malpractices lead to environmental decline and the integrity of ecosystems can be highly affected, which in turn reduces the land's ability to sustain people. This is evident in Laker (1990) when he stated that in South Africa the rate of soil erosion is 20 times higher than the average world. Soil erosion is a natural process, which includes the degradation of soil, and loss of soil structure. This natural hazard is caused by overgrazing. It removes the

dense grass cover which protects the soil (D'Huyvetter, 1985). Overgrazing is caused by economic pressure, poor grazing management and excessive estimates of grazing capacity. Many farmers use fertilisers for proper growth of plants, be it synthetic or organic fertiliser. Organic fertilisers provide plants with the necessary nutrients needed for them to grow healthy. Organic fertilisers also reduce the risk of nutrient leaching (Renee & Miller, 2015).

People do not only use natural resources for food but also for medicinal purposes. In the past, African people believed in traditional doctors and traditional medicine. This belief has been passed on from generation to generation- even today the majority of African people still use traditional medicines when ill. In South Africa it is found that 1:700 people use traditional medicine practices instead of modern doctors.

When looking at the value of the forest and plants within the forest, it becomes obvious how much these tribal groups have to do in order to conserve these forests for their benefit and that of nature. The knowledge about the value of the forests and plants within the forests needs to be shared with the younger generation at school and the wider community since this knowledge seems to mostly reside with the elders. At Bushula's J.S.S there are two gardens: one produces indigenous plants and the other produces wild edible plants. The food handlers use these wild edible plants to prepare meals for the learners. This is a practical way of educating the learners about the importance and value of the plants in the hope of also encouraging environmental sustainability.

Angela & Suarez (2012) suggested ways in which we can improve people-nature relationships. Firstly, they stated that educators believed that education is the main driving force for the creation and sharing of culture, values and beliefs. Angela and Suarez (2012) also emphasised the need to train people about conservation, the sustainable use of nature and the patterns of consumption. People also need to be made aware of this wisdom and the need to interact with professionals from other fields of knowledge concerning the field of sustainability. This type of knowledge should not only be shared through journals and books, but also needs to be shared with the general public as well. This whole practice forms what we can call "environmentally useful knowledge". They added that we need to promote discussion among ordinary people on issues related to environmental ethics.

In the following sections I introduce the educational theories used in this study to investigate the extent to which a School Nutrition Programme can be used as a catalyst to enhance community-based environmental learning. The section also discusses the social constructivist orientation, which is about the knowledge shared and constructed in different social contexts, and the relevancy of using community of practise and social learning in the study.

2.8. A SOCIAL CONSTRUCTIVIST ORIENTATION

This study is framed by social constructivism, which proposes that knowledge is created by people and influenced by their values and culture (Gibson & McKay, 2000). According to Van Der Horst & McDonald (2008), social constructivism emphasises that knowledge for change is not fixed and given, but shaped, constructed and reconstructed in different social contexts. Social constructivists such as Derry (1999) and McMahon (1997) emphasised the importance of culture and context in understanding what occurs in a particular society.

Social constructivism, therefore, is an appropriate orientation for this study as it explores how a school and community, living in a context of poverty, can bring about change through sharing the knowledge that is constructed in the context of their School Nutrition Programme. The implementation of any school nutrition programme and the ways in which the various stakeholders interact with each other are influenced by cultural practices, beliefs, conventions and other social factors.

The methodological implications of a social constructivist orientation for this study are explored in Chapter Three. For the remainder of this chapter I introduce the theories of learning in Communities of Practice and social learning as two complementary theories that have guided the generation and analysis of data in this study.

2.9 LEARNING IN COMMUNITIES OF PRACTICE

This section introduces Communities of Practice (Wenger, 1998) as a theoretical framework to explore how knowledge is shared and how learning occurs in relation to

food gardening and nutrition in my school's Nutrition Programme which, I will later argue, operates as a community of practice. In this section, I discuss the general characteristics of a community of practice, how communities of practice can be cultivated, and how social learning occurs and can be supported within a community of practice. Wenger's (1998) theory of Communities of Practice has helped me to review the extent to which my school's nutrition programme operates as a community of practice and to trace how social learning occurs through interactions between its members.

2.9.1 Defining Communities of Practice

According to Clark (1973), a community is a group of people sharing beliefs that allow communal interactions among the group. He further explained that the concept of 'community' is also used to convey different meanings, including those of loyalty, social activity or social structure. In line with this, Wenger, McDermott and Snyder (2002) defined a community of practice as a group of people who share a common concern, a set of problems or the passion they have about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. Wenger et al (2002) explained that in a Community of Practice, learning occurs through social participation in shared practices, and that people's interactions and informal learning processes are important for sharing tacit knowledge (see Section 2.7.2).

2.9.2 Characteristics of Communities of Practice

Wenger (1998) described communities of practice as having three broad dimensions: mutual engagement, joint enterprise and shared repertoire (See Table 2.1) which he defined as follows:

- *Mutual engagement* is the way in which members of a community of practice interact with each other and the extent of that engagement. Through these interactions, the community of practice develops its own culture and practices.
- *Joint Enterprise* is the common interest or project that brings members together, and gives them a goal.
- *Shared Repertoire* refers to the ongoing development and sustenance of a commonly-held reserve of procedures, shortcuts, concepts, actions, techniques, symbols, tools, forms, discourses, mental categories and so on which members of a community of practice use as they work on their joint enterprise.

Table 2. 1: Wenger's (1998) summary of the characteristics of communities of practice

DIMENSION	INDICATORS OF A COMMUNITY OF PRACTICE
MUTUAL ENGAGEMENT	<ul style="list-style-type: none"> ◦ Sustained mutual relationships; ◦ Shared ways of engaging (doing things); ◦ The rapid flow of information and propagation of innovation; ◦ Absence of introductory preambles as if conversation and interactions were merely the continuation of an ongoing process; ◦ Very quick setup to a problem to be discussed.
JOINT ENTERPRISE	<ul style="list-style-type: none"> ◦ Substantial overlap in participants' descriptions of who belongs; ◦ Knowing what others know, what they can do and how they contribute to an enterprise; ◦ Mutually defining identities; ◦ The ability to assess actions and products.
SHARED REPERTOIRE	<ul style="list-style-type: none"> ◦ Specific tools, representations and other artefacts; ◦ Local lore, shared stories, inside jokes, knowing laughter; ◦ Jargon and shortcuts to communications as well as the ease of producing new ones; ◦ Certain styles of talking, recognised display membership; ◦ A shared discourse, reflecting a certain perspective on the world.

Adapted from Wenger (1998, p. 73)

Table 2.1 shows how Bushula's Junior Secondary School's Nutrition Programme has the characteristics that Wenger (1998) defined as a community of practice using three different categories: mutual engagement, joint enterprise and a shared repertoire.

2.9.3 Learning processes in a Community of Practice

Social learning is central to an understanding of 'communities of practice', and Wenger (2010, p. 179) argued that communities of practice may even be viewed as "social learning systems". In communities of practice, learning occurs between the members through story sharing, personal experiences or helping each other to understand certain issues. Learning can either be formal or informal: informal learning deals with exchange of stories, whereas formal learning involves formalised activities such as systematic collection and/ or presentation of information.

Lave and Wenger (1991) developed the concept of legitimate peripheral participation to explain how learning occurs in a Community of Practice. Figure 2.2 below illustrates how social learning in a community of practice occurs through legitimate peripheral participation.

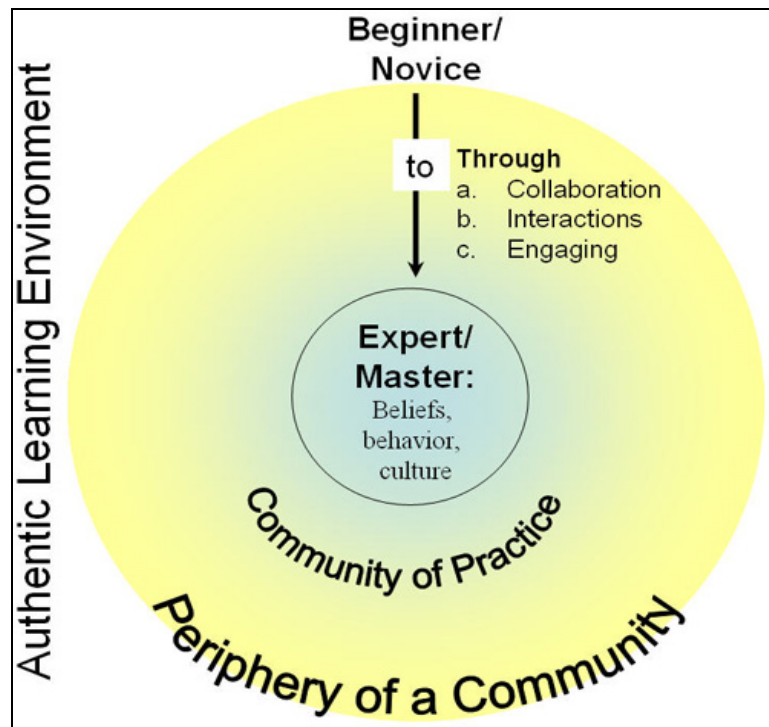


Figure 2. 1 Social Learning through Legitimate peripheral participation (Lave & Wenger, 1991, p.93)

Lave and Wenger (1991) explained the components of the phrase ‘legitimate peripheral participation’ as follows:

- ‘legitimate’: because all parties accept the position of ‘unqualified’ people as potential members of the community of practice;
- ‘peripheral’: because new members move around the periphery of the community of practice with an interest in what other members are doing, learning from their everyday practices. Within the scope of their developing knowledge, they do the peripheral jobs and gradually get entrusted with more important ones
- ‘participation’: knowledge can be acquired when people observe and/or participate actively in a situation and see how their actions and the actions of others affect the outcome.

Figure 2.2 above shows that a beginner or novice learns by moving from the periphery of a community of practice through collaboration, interaction and engagement within the group, to the centre of the community as he or she becomes an expert or master within that particular community of practice. The following section reviews types of knowledge that may be produced and shared in a community of practice.

2.10 REVIEW OF KNOWLEDGE IN A COMMUNITY OF PRACTICE

In this section, I review the types of knowledge produced in a community of practice and consider how that knowledge is shared between the members.

2.10.1 Defining knowledge

Knowledge can range from casual recall of facts or bits of information to deeply held convictions; it can be derived from the external environment through our sensory organs or it can be constructed by cognitive processes; it can be articulated through language or by tacit understanding at a pre-conscious level, it can be at the level of consciousness or part of the ‘gut’ (Vorwerk, 2004, p. 8).

Although Vorwerk (2004) above defined knowledge in relation to unit standards within the South African National Qualifications Framework, I argue that it is equally relevant to knowledge in the Schools Nutrition Programme that members can share as a group and extend to the community. For example, knowledge can be shared among members of the school’s nutrition programme who all perform differentiated tasks, such as working in the school’s food garden, preparing meals for learners, budgeting, monitoring, and planning.

Quintas & Tim (2002) similarly described knowledge as a mixture of various elements. It can flow and change direction easily and unexpectedly as experience and perspectives change; it can be formally structured but also intuitive, based on hunches and feelings, without conscious reasoning. Knowledge, therefore, is hard to capture in words or understand completely in logical terms. Information becomes knowledge through people contextualising information and making it relevant based on their personal experiences and values. Without its context it is just information, not knowledge. In order to create a context, an individual engages in social interaction to create knowledge (Nonaka, Toyama & Konno, 2001).

Nonaka (1991; 1994) introduced two dimensions of knowledge: the individual dimension, where an individual is the one who forms the idea or comes up with the idea, and the ontological dimension, where communities of interaction share and develop knowledge.

Knowledge is also a mixture of tacit and explicit elements. Botha, Kourie and Snyman (2008) stated that tacit and explicit knowledge should be seen as a spectrum rather than definitive points, because each one exists because of the other. To elaborate on this understanding of what knowledge is, the following section discusses the different types of knowledge such as declarative, procedural, causal and contextual knowledge.

2.10.2 Types of knowledge

This section discusses the different types of knowledge evident in social learning processes within a community of practice. This is relevant to the study's interest in investigating the types of knowledge produced and shared between members of the school nutrition programme (see research sub-question 2 and 3).

Knowledge is seen as an essential element in the process of achieving learning outcomes and becoming competent in a specified task or field (Vorwerk, 2004). He explained that “essential embedded knowledge” (*ibid.*, p. 9) is knowledge that is:

- (a) *Essential* for a learner to have in order to perform competently (for example knowledge of the nutrient value of various vegetables, and how best they are cultivated and prepared);
- (b) *Embedded*, that is, knowledge that is intimately linked to the purpose and context of the learner's performance (for example, knowledge of which vegetables grow best in that area and season, and the ways in which the meals should be prepared according to the culture and conventions of that community).

Vorwerk (2004) identified four categories of knowledge that constitute essential embedded knowledge: declarative, procedural, causal and contextual knowledge.

- **Know what (declarative knowledge):** This includes explicit information, attributes, names, rules, theories and principles based on language. Nieuwoudt and Monteith (2008) described declarative knowledge as “knowing that” something is the case, as declared in words, books, writing or verbal exchange. They added that it can also be called descriptive and propositional knowledge. Uluoglu (2000) defined declarative knowledge as the type of knowledge that contains truthful information stored in memory

and is known to be static by nature. It describes how things are, such as events, things and processes.

- **Know how (procedural knowledge):** Procedural knowledge is the knowledge exercised in the performance of some task; it is knowledge of how something occurs or is performed. This includes actions, responses, procedures and awareness of alternative ways of doing things, which are often tacit or embodied. Procedural knowledge can be directly applied and tends to be specific and involves hands on experience and practice at solving problems.
- **Know why (casual knowledge):** This is knowledge related to understanding and responding to problems or other situations; the learner is able to recognise causes and effects, symptoms and issues. This type of knowledge describes how something occurs.
- **Know about (contextual knowledge):** This type of knowledge is dependent on familiarity with people, situations, contexts and even cultures. According to Vorwerk (2004), it is sensory, relational and purpose-driven. This type of knowledge has implicit and latent meaning that is undeveloped and unexpressed and it is not usable unless a goal or situation emerges to initiate it. Contextual knowledge does not focus on a task or on the achievement of the goal, but it rather prepares the knower for action (Clancey, 1991). David (2012) added that contextual knowledge goes beyond declarative or procedural knowledge to include information or skills that are in part defined by the condition under which they are learned, in other words, contextual knowledge is new knowledge acquired through the act of doing something in a specific context.

Quintas, Jones and Demaid (2001), drawing on Polanyi's (1958) view of knowledge, differentiated between tacit and explicit knowledge. They defined tacit knowledge as a personal, context-specific and hard to formalise type of knowledge that includes subjective insights, intuitions and hunches. Tacit knowledge would include what is often referred to as "know-how", knowing the unwritten rules and procedures, knowing why

things happen (causality), knowing when (conditional) and under what circumstances (contextual) to perform a certain procedure or use a certain tool. Polanyi, as cited in Quintas & Tim (2002, p. 4) explained tacit knowledge as “we know more than we can tell”. Hence, tacit knowledge is difficult to make explicit and cannot easily be communicated through language or any other process of codification.

A similar understanding of tacit knowledge is presented by Nonaka (1991, p. 8) who wrote:

Tacit knowledge consists partly of technical skills – the kind of informal-hard-to-pin-down skills captured in the term ‘know how’... At the same time tacit knowledge has an important cognitive dimension. It consists of mental models, beliefs and perspectives so ingrained that we take them for granted and therefore cannot easily articulate them.

Tacit knowledge is essential for knowledge creation, whilst knowledge in general is formed through interaction between tacit and explicit knowledge; tacit or explicit knowledge *alone*, therefore, creates a static situation in which the group or individual depends too heavily on one form of knowledge. This situation is undesirable because it negates the innovation process and potentially beneficial new knowledge (Nonaka, 1991).

In this section, tacit and explicit knowledge have been discussed as types of knowledge that form part of the school’s School Nutrition Programme, since its operation depends on the knowledge produced and shared by members. When the community members interact, tacit knowledge is shared even though they may not be aware. Tacit knowledge also extends to explicit knowledge that is shared during training opportunities and workshops for the School Nutrition Programme members.

2.10.3 Skills and their relationship to knowledge

The knowledge shared by the School Nutrition Programme members also relates to skills because, in order to be able to do something, one has to have basic knowledge related to that skill.

According to the Joint ASTD and Department of Labour, USA (2012) a skill is the ability to carry out a given task with pre-determined results, often within a given amount of

time. This simply means that a skill is the ability that one processes and skills can often be divided into domain-general and domain specific skills. A skill is a learned ability to bring about the result one wants with maximum certainty and efficiency.

Toby (2009) introduced three different types of skills as follows:

- Work-specific: this skill focuses on a specific job or task and cannot be easily used in other situations or environments. This type of skill is specialised and technical.
- Transferable: can be used in many different situations and environments. These functional skills are made up of data, people and thinking skills. Examples of these skills are communication skills, planning, organising, and managing, analysing and problem solving.
- Self-management: this type of skill is also referred to as a 'personal trait' and refers to how a person conducts themselves. Examples include taking initiative, resourcefulness and reliability.

In a community of practice, knowledge is shared and effective practices are developed freely and informally; the community therefore has a commitment to overcoming resistance to knowledge-sharing. Little, Quintas and Ray (2002) added that all members of a community of practice have different expertise and knowledge, and each person is knowledgeable about their own sphere of existing expertise, whilst having limited or no experience of other spheres. A better understanding of knowledge (its forms and its circulation) in my school's nutrition programme's community of practice will assist me to investigate the potential of the school nutrition programme being a catalyst to enhance community-based environmental learning. As will be discussed in the following section, social learning theory provided me with a theoretical framework to examine the ways in which knowledge is produced and shared within that community of practice.

2.11 SOCIAL LEARNING THEORY

2.11.1 Introduction

This section introduces social learning theory and considers its relevance in the context of poverty, environmental sustainability and resilience. Social learning theory was defined by Wals, van der Hoeven and Blanken (2009) as a process stimulating people to reflect upon implicit assumptions and mental frames to enable new perspectives and actions to

develop. Keen, Brown and Dyball (2005) explained that social learning is a combination of action and reflection processes that take place amongst individuals and groups when they work to improve the management of the interrelationships between social and ecological systems. They added that, in order for social learning to occur, the ideas and attitudes learned by members of a small group must be diffused to members of wider social units where they belong.

Social learning is characterised by the ability of diverse groups to address difficult situations more easily (Wals, van der Hoeven & Blanken, 2009). This diversity, such as when different actors come from different backgrounds, requires all members of the group to deliberate towards understanding and responding to an issue they have identified as a group.

Apple, Glasser and Bradbury (cited in Wals, 2007) added that successful social learning depends on collective goals and visions shared by the group engaged in the process. It is important to create a space for engaging with opposition and dissonance whilst being mindful of other people's comfort zones because conflicts can block learning. For this reason, people who facilitate social learning processes are advised to have good skills in reading other people's comfort zones.

2.11.2 Social learning in a community of practice

According to Wenger (1998) communities of practice are the basic building blocks of a social learning system because they are social 'containers' of the competences that make up such a system. To be competent means to be able to engage with the community and be trusted as a partner in the interactions. Wals et al (2009) were in agreement with Wenger's (1998) position. They stated that it may be possible for social units to learn (institutions, organisations or communities of practice) not just large numbers of individuals learning independently.

Lave and Wenger (1991, p. 69) explained that Social learning in a Community of Practice, takes place through the combination of content, context, the nature and the outcomes of the social learning process. Therefore social learning is situated in a specific context and embedded within a particular social and physical environment. The type of knowledge produced is mainly socially constructed and is influenced by social values. As

these social groups meet in their environment, their focus is to learn more about their social needs and their collective needs as a community. Through these social interactions, the groups gain understanding and tolerance of one another. Social learning happens through social interactions. The social learning process allows the group to benefit from the outcomes. These outcomes show that all members benefit as they all share values, meanings and understanding knowledge or skills. The outcomes of social learning processes contribute to societal change because of the influence of the group on the individual and the individual on the group. Lave & Wenger used the diagram below to illustrate how the social learning process occurs in a Community of Practice.

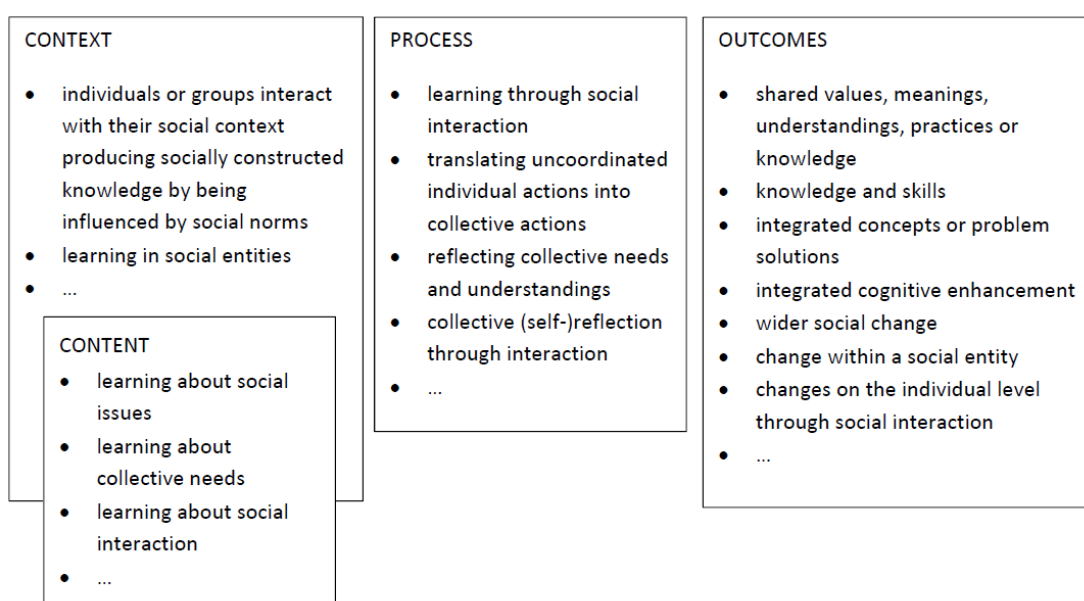


Figure 2. 2: Shows the social learning process in a community of practice (Lave & Wegner, 1991)

2.11.3 Relevance of Social Learning to environmental sustainability

Dyball, Valerie & Keen (1973, cited in Wals, 2007) stated that sustainability of the human-managed environment involves social learning, as the environmental problems demand co-operation between different groups operating at different levels. Such interactions typically include individual, community, specialists and the government; all make important contributions to the resolution of the social-ecological problem at hand.

Sustainable development depends on citizens who are literate and skilled, who are caring and informed decision-makers in all sectors and who can make good choices about their lives. Environmental Education and Education for Sustainable Development promote similar learning outcomes that promote quality education: the goal of the United Nation's

Decade on Education for Sustainable Development is to promote education for a more sustainable human society (Pigozzi, 2007).

Social learning can be considered as a way to create a learning system in which people learn from each other. It is about learning from one another *together* and it is about creating trust and social cohesion. Social learning plays a role in developing resilience among groups. This connection makes them open up to one another and inclined towards being held accountable for risks or alternative views (Wals, van der Hoeven & Blanken, 2009).

Wals (2007) added that social learning is a process that develops people's ways of doing things, it is often influenced by people's ability to "frame" and "reframe". He referred to "frames" as the tools or processes that help us to represent the world around us and represent that world to others. The process of "reframing" is a deconstruction, that is, people become aware of their own and other's hidden assumptions and ideological underpinnings (frames). In his discussion, Wals (2007) stated that people become stuck in their own frames, having their own ways of seeing things and looking at the world and interpreting reality, unable to see how these frames spoil their judgements and their interactions. According to Taylor (2000) framing and reframing can be used as an analysis tool in different fields such as psychology, sociology, business management, artificial intelligence, decision making, negotiation and environmental conflict management .

Wals (2007) suggested that people should work within their limitations so that they can create authentic connections with other people, thereby empowering them to work jointly to overcome the challenges they face. He advised that to prepare for social learning process, people must first become aware of their own frames and explore reframing their perspectives and actions in the world. The members of my school's School Nutrition Programme can make a very powerful team if they can take Wals' ideas about "framing and reframing" as a starting point for social learning processes to occur within the school nutrition programme's community of practice.

2.12 CONCLUSION

This chapter has looked at the historical context of the National School Nutrition Programme as a poverty alleviation strategy in South Africa. The discussion included the effects of poverty in schools and communities and gave an overview of the School Nutrition Programme, including the legislation underpinning its implementation, its objectives, successes and challenges. Attention was drawn to the roles of school-community food gardens and school-community links in enhancing food security in areas of high poverty. The chapter also outlined the study's theoretical framework, explaining that a social constructivist orientation and the complementary theories of Communities of Practice and Social Learning provide a vantage point to investigate the extent to which my school's Nutrition Programme can be used to enhance community-based environmental learning in a context of poverty and malnutrition. In my view, food security strategies like food gardens can be successful when members of the school's Nutrition Programme work as a community of practice to share and enhance their knowledge and skills with the wider community. It is from this starting point that I conducted this research project. The following chapter describes how I drew on the concepts and theories described in Chapter Two to design and conduct the research.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This study investigated the extent to which the School Nutrition Programme could be used as a catalyst for community-based environmental learning and to enhance food security. As outlined in chapter two, Community of Practice and Social Learning theories are theoretical bases from which I can investigate people's interactions in relation to the School Nutrition Programme. This chapter explains the design of the research as an interpretive, in-depth case study that generated data using questionnaires, document analysis, semi-structured interviews and participant observations. This chapter also reports how I managed and analysed this qualitative data, and also what steps I took to ensure that the research was conducted in an ethical way, based on valid, trustworthy data.

The research was conducted between 12 April and 10 September, 2012 at Bushula's Junior Secondary School, a public school in the Lusikisiki District in the Eastern Cape Province. The study consisted of ten participants who were members of the School Nutrition Programme. Of the ten members, eight members were the School Nutrition Programme Committee members and the other two participants were school food handlers. Although these people were not the only active members of the School Nutrition Programme, they were selected to participate in the study because of their roles and high levels of involvement as follows:

- The school principal was the accounting officer of the School Nutrition Programme at site level.
- The School Nutrition Programme coordinator supervised the daily activities of the programme.
- A member of the School Governing body represented the parents' needs related to the School Nutrition Programme.
- Three food handlers prepared the meals for the learners;
- The caregiver, currently termed as the Learner Support Agent (LSA), was responsible for the welfare of learners, which included supporting those learners who lack food and proper nutrition;

- Three educators, who were members of the School's School Nutrition Programme Committee, worked together to make decisions related to the implementation of this programme.

3.2 A SOCIAL, CONSTRUCTIVIST, INTERPRETIVIST CASE STUDY

3.2.1 Meaning is socially constructed

As outlined in Section 2.8, this qualitative study was framed by social constructivism, a theory which emphasises that reality and our knowledge about it is influenced by people's interactions, their culture, language, values, social norms and histories. Social constructivism is based on specific assumptions about reality, knowledge, and learning. To understand and apply models of instruction that are rooted in the perspectives of social constructivists, it is important to know the premises that underlie them.

Reality: Social constructionists believe that reality is constructed through human activity. Members of a society together invent the properties of the world (Kukla, 2000 p. 56). For the social constructivists, reality cannot be discovered; it does not exist prior to its social invention.

Knowledge: To social constructivists, knowledge is also a human product, and is socially and culturally constructed (Ernest, 1999; Gredler, 1997; Prat & Floden, 1994). Individuals create knowledge and meaning through their interactions with each other and with the environment they live in.

Learning: Social constructivists view learning as a social process. Learning does not take place only within an individual, nor is it a passive development of behaviours that are shaped by external forces (McMahon, 1997). Meaningful learning occurs when individuals are engaged in social activities – such as those in a community of practice.

3.2.2 Qualitative research design

Qualitative research is used to interpret phenomena in their natural settings in terms of the meaning people bring to them. A qualitative research design involves an interpretive, naturalistic approach to its subject matter and prioritises what the data contributes to the research question or to the existing information (Denzin, 1994; Pope and Mays, 2006).

In qualitative research, the researcher is a key instrument because she/he is the one who generates data from the chosen research methods. A qualitative study is reflective,

interpretive and also shows a holistic and complex picture of what is studied. It mainly focuses on the participants' perspectives, meanings and opinions (Morse & Richards, 2002). In this study, I generated qualitative data using questionnaires, document analysis, semi-structured interviews and observations. A more detailed account of these methods and tools is provided in Section 3.3.

In this study, the qualitative approach required me to spend time interacting directly with the participants during interviews and observations. Morse & Richards (2002) confirmed that to be able to overcome the limitations in qualitative research studies, one needs to be willing to commit to long hours in the field generating data and gaining access to the field. I was committed to a time-consuming process of data generation and data analysis; this was beneficial in the sense that I obtained more data as I had to be with the participants in the field to observe their ways of doing things in their real context, as will be discussed in Section 3.3. The following section (3.2.3) describes how this qualitative research project was framed as an in-depth, interpretivist case study.

3.2.3. An Interpretivist case study

This study took place in the context of Bushula's Junior Secondary School where I teach. It was an interpretive case study that endeavoured to explore the extent to which the School Nutrition Programme in Bushula's Junior Secondary School could be used as a catalyst for community-based environmental learning and to enhance food security.

In the interpretivist approach, the main interest is in the meaning people make of a phenomenon being studied. Terre Blanche and Durrheim (1999a) argued that the interpretivist tries to make sense of feelings and experiences and is sensitive to social situations because people are observed in their social contexts. An interpretivist approach requires qualitative research methods that are flexible, context-sensitive and largely concerned with understanding complex issues. The interpretivist researcher is not taken as being entirely objective, rather as someone who is part of the process. Section 3.6 will discuss the steps taken in this case study to conduct trustworthy, ethical research within an interpretivist approach.

A case study is a strategy of enquiry in which the researcher explores in-depth a programme, event, activity, process or one or more individuals and generates data using a

variety of data generation procedures over a sustained period of time (Creswell, 2009, p.184-185). The exploration of a case takes place through detailed, in-depth data generation involving multiple sources of information that is rich in context. These commonly include interviews, documents, observations or archival records.

According to Yin (2003), a case study can be used to answer “how” and “why” questions, for example, sub-question two of this study investigated how knowledge produced by the School Nutrition Programme was shared among members. There are three types of case studies as discussed by De Vos (2005, p. 272):

- An *Intrinsic case study* focuses on gaining a better understanding of the individual case with the aim of describing it.
- The *instrumental case study* elaborates on a theory to gain a better understanding of a social issue. It serves the purpose of facilitating the researcher’s knowledge about a social issue.
- The *collective case study* furthers the researcher’s understanding of a social issue or population being studied by comparing the cases that had been chosen so that the theories can be extended and validated.

Intrinsic case study was identified as appropriate for this study since my interest was to gain a better understanding of the Bushula’s Junior Secondary School’s Nutrition Programme and whether it is operating as a community of practice, to identify the type of knowledge that is produced and shared amongst the members of the programme. The study also aimed at identifying what the members learn and how they learn. In order to do this, I had to gain a better understanding of the programme with regard to how it operates and the learning that occurs among members.

3.3 DATA GENERATION METHODS

3.3.1 Overview of data generation methods

As a researcher working in the social constructivist tradition, I selected a variety of data generation methods that gave me access to the social norms, culture and history of my school nutrition programme, including the people’s experience of it. To build up a case study and answer my research question, I used four data generation methods: questionnaires, document analysis, semi-structured interviews and observations. Table

3.1 below summarises these methods, the data sources I drew upon, my reasons for selecting these data sources, and the data index.

Table 3. 1: Summary of data sources

DATA GENERATION METHOD	SOURCES OF DATA	REASONS FOR COLLECTING DATA	DATA INDEX
Semi-structured interviews	1SNP co-ordinator	<ul style="list-style-type: none"> • Can provide up-to-date overview of the School Nutrition Programme. • Can give practical insights to the programme based on her experience. • Knows about learners in need of special support. • To understand their views and involvement in the programme and to draw them into the process. 	Int. 01
	3 educators	<ul style="list-style-type: none"> • Can identify learners in need of special support. • Communication with parents. • Better knowledge (Balanced diet). • Accepted gardening. 	Int. 03-05
	SCHOOL MANAGER	<ul style="list-style-type: none"> • Can show sustainability of the programme based on his monitoring skills. • Enlighten the members on how the programme is implemented. 	Int. 02
Observations	3 Educators 1 Educator 3 Food Handler Parents (SGB'S) Care Giver	<ul style="list-style-type: none"> • Members working as a community of practice. • Lesson presentation in grade 7 class. • Planning for the day ahead and preparation of meals. • They help in monitoring the garden. • Monitors the feeding of children. 	Obs.04 Obs. 08 Obs.06 Obs.04 Obs.05
Document analysis	Generic Training Manual- Food Safety; National School Nutrition Programme Guide; Revised menu options for the NSNP; School Nutrition Programme Meetings; The integrated food strategy for South Africa; Education	<ul style="list-style-type: none"> • For more information about the training of the stakeholders in the programme. • Background of the School Nutrition programme and the operation of the School Nutrition Programme. • Gives more information about the recommended menus (examples of menus and statistics). • How the School Nutrition programme is run. • The preparations and developments. • Improvements made to the School Nutrition programme. • Mutualism between the community and the school (employment of community members who in turn render services as they prepare meals at school). • Sustainability of the programme • Discusses the relevant ways of implementing food security and the history of origin of poverty • Discusses malnutrition in South Africa and how the School Nutrition Programme can alleviate this social issue. 	Doc.01 Doc.02 Doc. 03 (Doc. 0 Doc. 12 Doc.13-14)

	Policy- School feeding scheme.		
Questionnaires	Given to 3 educators	<ul style="list-style-type: none"> • Interviewees use them in preparation for the one on one interviews • Serve as the draft of the questions to be asked during interviews 	Doc.

3.3.2 Document analysis

Document analysis is a form of qualitative analysis that requires the reader to analyse, interpret, locate and make conclusions about evidence presented in documents. When selecting documents relevant to this study, I followed the criteria for selecting the documents as suggested by Creswell, Ebersohn, Eloff, Ivankova, Jansen, Pietersen, et al (2007) that the researcher should consider the purpose of the documents chosen and how they relate to the study. Document analysis was the first data generation method I used in this study because I wanted to understand what is taking place within the programme before conducting interviews and observations.

Document analysis helped me to identify the data which was relevant to the research question about the people who are involved in the School Nutrition Programme and the roles they play in the implementation of the programme. The research question to which this study responded was: "To what extent can a School Nutrition Programme serve as a catalyst for community-based environmental learning and enhanced food security?" I reviewed documents that shed light on the programme such as the National School Nutrition Programme training manuals, including menus, and minute books for the nutrition committee.

Table 3.1 illustrates the documents I reviewed and the reasons for selecting those documents. Creswell et al (2007) noted that documents can be analysed at any time suitable to the researcher; for that reason I chose to analyse the documents first, since I wanted to identify the people who were involved in the school's School Nutrition Programme and how the programme operated. Reviewing the documents gave me a better understanding of the context in which the School Nutrition Programme operated and helped me to conduct my observations and interviews more carefully. However, I needed to consider the limitations of using documents in interpretivist research. For

example, some documents may be biased, inaccurate, can be easily damaged and some are not intended to be used for research processes (Bailey, 1994, p. 310).

Creswell et al (2007) cautioned that documents may require the researcher to search for the information in hard to find places, which can be time-consuming. They added that it can be very difficult to find hard copy material of some documents, or that they are found in bad condition or not found at all. Bailey (1994) explained that documents are at risk of misinterpretation, especially if the researcher is not fluent in the language of that particular document.

To overcome the limitations above, I first checked the condition of each document and selected only those which were relevant to my research and also in good condition.

3.3.3 Questionnaires

According to James (1997), a questionnaire is a means of drawing out the participants' feelings, beliefs, experiences, perceptions or attitudes of some sampled individual. As a data collecting instrument, it could be structured or unstructured. It is most frequently a very short and clearly stated pre-planned set of questions designed to bring out specific information to meet a particular research.

A questionnaire can contain as many statements as questions and its main purpose is to gain facts and opinions from people who are well-informed. Questionnaires are the most generally used instruments in qualitative research (Babbie & Mouton, 2001).

Hand-over questionnaires have a few limitations: it may happen that a respondent may lose the questionnaire or not even complete the questionnaire and, in some instances, there may be challenges of respondents having limited writing and visual competences. The respondents' motivation can be difficult to assess, affecting the validity of the response.

To choose the research participants, I decided to use non-probability sampling. This is a sampling method that involves a non-random selection of respondents whereby the respondents do not have an equal chance of being selected. As De Vos, Strydom, Fouche and Delport (2005) declared, non-probability sampling is further divided into seven

sampling techniques, which are accidental sampling, purposive sampling, quota sampling, dimensional sampling, target sampling, snowball sampling and spatial sampling. For this research study I used purposive sampling. Using this sampling technique allowed me to choose the respondents with the suitable characteristics needed for the completion of the study since I was looking for people with more knowledge of the schools' School Nutrition Programme

In this study, I first drafted a questionnaire covering the highlights of the research questions. This meant that the research participants were given the research exemplar interview questions to orientate them on what to expect during interviews. I decided to draft these questionnaires to enable the respondents to utilise everything they knew about the school's School Nutrition Programme. I distributed the questionnaires in person to the ten participants, including the School Nutrition Programme staff and teachers before interviewing them. I found it beneficial because it gave them time to become familiar with the forthcoming interview while they responded to the preliminary questions on the questionnaire. This idea also gave the respondents an opportunity to clarify questions where they were needed. Some of the participants took a long time to return the questionnaires and 2 out of 10 participants returned them with no responses.

3.3.4 Semi-structured Interviews

An interview is a two-way conversation in which the researcher asks the participant questions to generate data and to learn about the ideas, beliefs, views, opinions and behaviours of the participant (Creswell, et al., 2007). Shneiderman and Plaisant (2005) have a similar understanding of interviews as they state that an interview is a method of generating data using a set of planned oral questions. They add that interviews can be productive as the interviewer can discuss issues of concern that may eventually lead to focused, useful and broad suggestions. Byrne (2001) also recommended the use of interviews in a qualitative study since they have the potential to provide rich, detailed information that is well-contextualised. The aim of qualitative interviews is to see the world through the participants' eyes. Hence, they serve as an important source of information when used correctly. Interviews aim to get rich descriptive data so that the researcher can understand the participants' construction of knowledge and social reality (Creswell, et al 2007).

I chose to conduct semi-structured interviews in this study. De Vos, Strydom, Fouche, and Delpont (2006) stated that researchers use semi-structured interviews to gain a detailed picture of the participant's beliefs about, or perceptions of, a particular topic. Semi-structured interviewing gives the researcher and the participant much more flexibility, and the researcher is able to follow up on particular interesting avenues that emerge during the interview.

I conducted ten semi-structured interviews. The interviewees included the school principal, the School Nutrition Programme coordinator, three teachers who are the members of the School Nutrition Programme Committee members, three food handlers, the School Governing Body and the care giver, who is also a member of the School Nutrition Committee. The interviews were conducted in English, with the exception of the School Governing Body, care giver and the food handlers whose interviews were conducted in isiXhosa, their home language.

All of these interviews were transcribed to make it easy for me as a researcher to have the written text of the responses for careful analysis. In the case of the interviews that were conducted in isiXhosa, the transcribed responses were also then translated in English to help other readers access the ideas given by the research participants in the common language of English.

I found that, as the participants were given the opportunity to provide more relevant information through semi-structured interviews and use of interview schedules (see Appendix A1), they became more relaxed and focused. The semi-structured interviews helped me to probe for more data from the participants as they were given the opportunity to provide more relevant information. This was important to me because this qualitative, interpretive study depends on thick data description. Gillham (2000) suggested the use of an audio-recorder, once permission had been granted by the respondents. I used a cellular phone recording facility to make sure that I captured each and every word of the interviews.

Semi-structured interviews have some limitations, which I needed to consider in this study:

- Bias: the researcher can lead the research participant in the direction of his/her own interest through selected research questions. To avoid this limitation, I drafted interview schedules which served as a guideline for both the researcher and the research participants (see Appendix A7).
- Time constraints: during semi-structured interviews, research participants may provide a lot of detail or deviate from the point as they enjoy free conversations. As a researcher, I minimised this limitation by using the prepared questions to guide the interviews.
- Emotions: Cristian (2008) explained that an interviewer may need to deal with reluctant participants with very strong emotions. To avoid this situation, the researcher needs to maintain a professional relationship with the participant and avoid becoming emotionally involved in the interviewee's responses.

To overcome the limitations above, I used interview schedules (see Appendix A1) to guide the interviews and keep them focussed. I avoided being biased by accepting each and every participant as a unique individual and accepted their different views during the interviews without judgement.

3.3.5 Participant observations

Marshall and Rossman (1989) defined observations as a systematic description of events, behaviours and artefacts in the chosen social setting where the observer's five senses are used. I chose participant observations as part of my data generation methods, because they gave me opportunities to record and observe people participating in their daily activities. More often, those activities were related to the school's Nutrition Programme, for example when the School Nutrition Programme members were helping in the food garden and during meetings about the School Nutrition Programme issues. These observations added to the reliability and trustworthiness of my study since the data were generated from my direct experience. Cantrell (1993) confirmed that observations give the researcher direct, first-hand experiences with the phenomenon being observed.

As participant observer, the researcher needs to be part of, and even contribute to, the situation being observed. This helps the researcher to listen, enquire, observe and write up notes (Graziano & Raulin, 2000, in de Vos et al, 2005).

Cohen, Manion & Morrison (2000) supported Graziono & Raulins's views that observations allow a researcher to gather data about and in the physical settings (including people's formal and informal interactions). This data generation method allowed me to take a closer look at the development strategies of the School Nutrition Programme and discover what is taking place at the school and in the surrounding community where I teach. I observed interactions between the stakeholders operating in the School Nutrition Programme's Community of Practice and their different roles. I was a participant-as-observer and observer-as-participant in some activities like school gardening, and I participated in other out-of-school programmes like community meetings (see Appendix A2).

3.4. DATA MANAGEMENT

I kept all the collected transcribed data in hardcopy (in a cardboard file) and digitally (saved on my computer and onto a CD). The cardboard file was divided into four sections, according to the number of the research methods I used, as explained in Section 3.6. This technique also made it easy for me to look for data as it was organised in one place.

Interviews were tedious to transcribe because I had to listen to the audio-recordings and then transfer them into writing. Some interviews were conducted in the participant's home language, isiXhosa, which I first transcribed and then translated into English. Some of the audio-recordings were of poor quality that required me to keep playing them back. Here, accurate listening skills were essential. Cohen, Manion & Morrison (2000) noted the importance of transcribing interviews and advised researchers to guard against the mistakes of misinterpreting, distorting and reducing or losing data.

3.5. DATA ANALYSIS

3.5.1 What is data analysis?

Bogdan and Biklen (1992) defined qualitative data analysis as "working with the data, organising them, breaking them into manageable units, coding them, synthesising them and then searching for patterns" (p.145). Data are analysed to discover patterns, concepts, themes and meanings. The process of data analysis starts with the categorisation and organisation of data in search of patterns, critical themes and meaning that emerge from

the data. This process is sometimes called ‘open coding’, which Strauss and Corbin (1990) identified as the process through which the researcher identifies and tentatively names conceptual categories with which to group the phenomena.

3.5.2 Data analysis process

Qualitative data analysis is an ongoing and interactive process implying that data generation, processing, analysis and reporting are intertwined (Creswell et al, 2007, p. 99-100).

My analysis was divided into three phases:

3.5.2.1 Phase one of data analysis

This phase aimed at responding to question 1 of the research study which asked: “How the school’s School Nutrition Programme operating as a Community of Practice?” It focussed specifically on finding out if Bushula’s J.S.S’s Nutrition Programme was operating as a community of practice. The analytical categories used for this phase were the fifteen characteristics of Communities of Practice as proposed by Wenger (1998). Wenger more recently classified these characteristics into three broader groupings: Mutual engagement, joint enterprise and shared repertoire (See Table 2.1).

3.5.2.2 Phase two of the data analysis

This phase of data analysis responded to question two and question three of the study which examined the different kinds of knowledge and skills produced and shared in the Community of Practice. It is in this phase where I discovered that there are different types of the knowledge and skills shared in the schools School Nutrition Programme.

3.5.2.3. Phase three of the data analysis

Phase three of the study focused on answering research question 4 of the study: “How is learning taking place in this Community of Practice?” This is built on Phase two of the study, and looked in more depth at the different ways in which learning occurs, both formally and informally.

To guide this process, Creswell (2009) recommended a linear, hierarchical approach, which consists of six steps:

- Organise and prepare data for analysis.

- Read through all the data.
- Conduct analysis based on the specific theoretical approach and method (coding).
- Generate a description of the setting or people & identify themes from the coding.
- Represent the data within a research report (in this study, see Chapter 4).
- Interpret the large meaning of the data (in this study, see Chapter 5) (p.185-190)

Step 1- *Organize and prepare data for analysis*: This is the period where I familiarised myself with the data generated. This step involved the listening of audiotapes and transcribing the interviews, where I translated the written interviews from the interviewee's home language (isiXhosa) to English; reading the transcripts and field notes.

Step 2- *Read through all the data*: In this step I had to acquire a general meaning of the data generated, the tone of the participants' responses and the general thoughts of the participants.

Step 3- *Begin detailed analysis with a coding process*: In this process I coded the data using the *a priori* themes developed by Wenger (1998). In the first round of analysis, the themes were the fourteen characteristics of communities of practice, which were grouped into three categories (joint enterprise, mutual engagement and shared repertoire) (see section 2.9.2). This analysis was done towards achieving Goal 1 of the study, which was to "understand the various partners of the School Nutrition Programme, their roles and the areas for possible action-taking at school related to environmental learning and food security". Goal 2 of the study, which was to identify what kind of knowledge occurs in the community of practice, and goal 3 which was to identify what skills were developed and shared in this community of practice.

Step 4- *use the coding process to generate a description of the setting*. This step concerned developing analytical memos that are theoretically informed to analyse data, and to consider how these descriptions and themes were going to be presented (Creswell, 2009). In phase one, I coded the data in three phases, as described above. I coded my data using the characteristics of Communities of Practice as my categories. Information relevant to category one, which was mutual engagement with its sub-categories, was identified using a yellow sticker. Category two, which was a joint enterprise, and its sub-

categories were identified using a brown sticker, and category three, which was shared repertoire, and its sub-categories were allocated colour blue.

The different types of knowledge were differentiated using different colours:

- Explicit knowledge was given colour orange.
- Tacit knowledge was given colour green.
- Other categories, like declarative knowledge was identified using a red star.
- Procedural knowledge was given an orange star.
- Causative knowledge was given a green star.
- Contextual knowledge was given a yellow star.

The different types of skills were identified as:

- Functional skills.
- Knowledge based skills.
- Personal-traits skills.

Step 5- *Describe how the description and themes will be represented:* I used narrative passages to convey the findings of my analysis. I did this by giving a detailed discussion of the complete sub-themes and use of theories as discussed in Chapter Two of the study. These sub-themes and theories included: the characteristics of Community of Practice; types of knowledge and skills produced and shared; in what way learning is taking place in the Community of Practice (based on the sub-questions of the research study).

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Step 6- *Identify the overall meaning of the data:* This was the final step of the data analysis, which involved interpreting, or making meaning, of the data. This step included the concluding insights, recommendations, openings for further research and reflections on the findings of the study.

3.6. EVIDENCE OF VALIDITY AND TRUSTWORTHINESS

According to Maxwell (1992, p. 282) "... qualitative researchers all believe that not all possible accounts of some individual, situation, phenomenon and activity are similarly useful or legitimate". "Validity is the degree to which the conclusions drawn by the researcher are sound and give the research strength and rigour". (Terre Blanche,

Durrheim & Painter, 2006, p. 91). For a valid and trustworthy case study, I used multiple data collection methods, which included face-to-face interviews conducted with the stakeholders involved in the School Nutrition Programme because they offered diverse experiences of the programme. Creswell, et al (2007) supported this statement by adding that using multiple methods of data collection, such as observations, interviews, and documents will lead to trustworthiness of the study.

In this section, I describe some of the strategies I used in this study to produce accounts of the environmental learning associated with the school's nutrition programme that are useful, rigorous and legitimate.

3.6.1 Sampling of research site, participants and documents

Sampling is one of the most important research methods when doing research and it is imperative for a researcher to fully understand this concept clearly before selecting a sampling plan and conducting the main research. De Vos, Strydom, Fouche, & Delport (2005) defined a sample as a small portion of the total set of objects, events or people which put together the subject of a study. The use of sampling helped me retrieve accurate information and data than I would have obtained if I had used the entire population of the school's School Nutrition Programme. Using sampling also saved me a considerable time, money and effort, which I used for obtaining better and more in-depth data. For this research I used the purposive sampling technique because it allowed me to choose a sample that was suitable for my own needs, or more appropriate for the research with regard to characteristics, representatives or the typical attributes.

3.6.2 Methodological triangulation

Methodological triangulation (Willis, 2007) concerns the involvement of two or more data generation methods and assures the validity of the research. I was able to triangulate my data through the combination of interviews, observations, and document analysis to ensure that I generated quality data. Since one method supports another, using more than two data generation methods helps compensate for the others' weaknesses by the counterbalancing strength of the additional method.

3.6.3 Well-planned, focused data generation

For this research I used four data generation methods (semi-structured interviews, questionnaires, observations and document analysis). All these methods involved a lot of planning and accuracy. Before actually interviewing the participants, I first compiled a draft of questions that I was going to use for the semi-structured interviews and for the questionnaires. The most challenging data generation method was document analysis because I had to work through thick piles of documents looking for data. I had to be focused and accurate by ensuring that I obtained all the documents in time so that I could allow myself sufficient time to work through them without pressure. Hitchcock and Hughes (1989, cited in Cohen, et al, 2000) added that even the way interviews are conducted can affect validity, for example some interviewers fail to listen to the interviewees, and instead talk too much and influence the interviewee's responses.

3.6.4 Transparent, systematic data analysis

The data generated and analysed in the study was required to be transparent, meaning that it would be obvious and easy for the readers to recognize. Making the research case study transparent would allow people with interest to have access to the research. To ensure that people such as the research participants, colleagues, learners and those that have interest in the data would have access to it, I compiled a hard copy file of all the data generated. I also prepared software copies of the analysed data. This research case study was done in a very systematic and organised manner.

3.6.5 Audit trail

Koch (2006) suggested that, for a study to establish trustworthiness a researcher needs to develop a research audit trail, that is, she/he must be able to audit the events, influences and actions of the researcher. In order to develop a detailed audit trail, Creswell and Miller (2000) suggested that the researcher needs to maintain a log of all research activities, develop memos, maintain a research journal and document all data collection and analysis procedures throughout the research. To keep an audit trail for my study, I created a special file to keep raw data for all research methods for the study, for reference purposes (See section 3.3). This would help any reader to follow each stage of the research process and to trace the research logic. This also included the way I systematically organised and filed analysed data, so that anyone could trace from the findings to analytical memos, to the coded raw data.

3.7. RESEARCH ETHICS

Creswell (2003) emphasised the significance of considering ethics in qualitative research. Towards conducting an ethical study, I negotiated access to, and gained permission from all the stakeholders: the school principal, school management team, the three educators who were the committee members of School Nutrition Programme, School Governing Body members involved in the School Nutrition Programme, food handlers and the care giver. I first sent letters to research participants, requesting their permission (Appendix A3- A5) and then talked to them in person before the interviews and asked for their permission to use their interview responses for my study. Some of the stakeholders did not agree to my proposal at first as many of them were worried that I would expose their names in the study. One of the participants even thought I would use this information to mess up his/her reputation, but after explaining to them that I merely needed the interviews for a research study that I would be doing and that they would remain anonymous and no harm would be done, they granted me permission to use their interviews.

I allowed all participants to influence the interviews; the research participants were allowed the freedom to contribute their ideas to the study, which benefitted the study as they suggested additional strategies to improve the operation of the schools' School Nutrition Programme and its extension into the community. The drafting of the questionnaires, which were issued to the participants prior to the interviews (Appendix A1) prepared them for the interviews and helped them develop their individual responses. They came up with the ideas that contributed to the study and to the school's School Nutrition Programme since the questions I asked were open-ended questions, which allowed for people's own ideas to be expressed and explored.

I was ready to respect the wishes of those who might not want to participate, but fortunately all the participants were available when needed. One participant did not want to be captured on camera during the interviews and I decided to respect her request and made sure that she was not in any of the photographs I took. I ensured that even those whose low levels of literacy prevented them from reading my letters could understand my research intentions and the expectations of their involvement in the research. To achieve

that, I discussed orally what was expected of each and every participant before the interviews began.

3.8 CONCLUSION

Chapter 3 has described the study's qualitative, social constructivist orientation and presented a rationale for its design as an interpretive case study. I have reported the three methods of data generation used in this study: document analysis, semi-structured interviews and observations, and the two-phased approach to data analysis. This chapter has also described the steps taken to ensure that it was conducted in an ethical way, and that the research findings were trustworthy and valid. The next chapter will present the data generated during the study.

CHAPTER 4: REPORTING THE DATA

4.1 INTRODUCTION

In this chapter, I present the data generated from the 4 April 2012 to 10 April 2013. My interest was to understand how the School Nutrition Programme could be used as a catalyst to enhance food security and community-based environmental learning. The data generated were presented in three phases as discussed below:

Phase One (Section 4.2) established whether the School Nutrition Programme was operating as a Community of Practice. This phase focused on the characteristics of communities of practice as proposed by Wenger (1998). I decided to use these characteristics, since I argued that the School Nutrition Programme at Bushula's Junior Secondary School operated as a Community of Practice. My claim here was that the practices of the programme's members could be extended to the community through food gardens to reduce poverty. This phase of data presentation laid the foundation for the study as Phases Two and three responded more directly to the research question. In Phase One, the characteristics of Communities of Practice, as evident in Bushula's JSS's School Nutrition Programme, were presented in detail, based on my data coding and analytical memos.

Phase Two (Section 4.7) of this chapter describes the different types of knowledge and skills learnt, produced and shared in the school's Community of Practice. This is the section that responds to the research sub questions 2 and 3 of the study, which is about the kinds of knowledge and the kinds of skills produced and shared in a community of practice.

Phase Three (Section 4.13) of this chapter looks at how the community members learned through their involvement in the School's Nutrition Programme Community of Practice. Together, Phases Two and Three describe how knowledge is produced and shared in this Community of Practice, and responds to the study's research question about the ways that my school's Nutrition Programme could be a catalyst for community-based

environmental learning and enhancing food security, particularly sub-question 2 about the types of knowledge produced, shared and learned in the Community of Practice.

The structure of this chapter is guided by the organisation of analytical memos that I constructed, framed by the Communities of Practice theory of Lave and Wenger (1991 & 1998) (see Section 2.10) and Vorwerk's (2004d) ideas about production and sharing of knowledge (see section 2.11).

4.2 PHASE ONE OF DATA ANALYSIS: MY SCHOOL'S NUTRITION PROGRAMME AS A COMMUNITY OF PRACTICE

A community of practice is a group of people who share a common concern, a set of problems or the passion they have for a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger, McDermott and Snyder (2002); see section 2.10.1). I consider my school's School Nutrition Programme to be a Community of Practice since it has the features of a Community of Practice. These members work towards a common goal, which is to improve the quality of education by enhancing school children's active learning capacity, improving their school attendance and alleviating hunger. People at school are employed for different reasons, such as teaching (educators), preparing meals for learners (food-handlers), and attending to the welfare of learners (caregiver) etc. Figure 4.1 shows the relationship among all school members as they operate directly or indirectly with the School Nutrition Programme for the benefit of the learners at Bushula's JSS.

4.3 OVERVIEW OF THE SCHOOL NUTRITION PROGRAMME AT BUSHULA'S JUNIOR SECONDARY SCHOOL

Bushula's Junior Secondary School's Nutrition Programme has been implemented annually since 1995. Most members have changed over that time since the term of office is from April to March the following year. The school's School Nutrition Programme is managed by a committee which currently consists of seven members who work together to perform different roles whilst being part of the programme. This committee consists of the school principal, the programme coordinator, three educators, members of the School Governing Body and the school caregiver, who is currently known as the 'learner support agent'.

Although the three food-handlers are not committee members, they are included in the study since they were actively involved in the process of preparing and serving the meals to the learners. Wider members of the School Nutrition Programme include educators, parents and learners who volunteer to perform some duties related to the running of the School Nutrition Programme. This mutual engagement involves all the members at school and some of the members from the community, as illustrated in Figure 4.1. This illustration shows the relationship between the school and the members of the School Nutrition Programme.

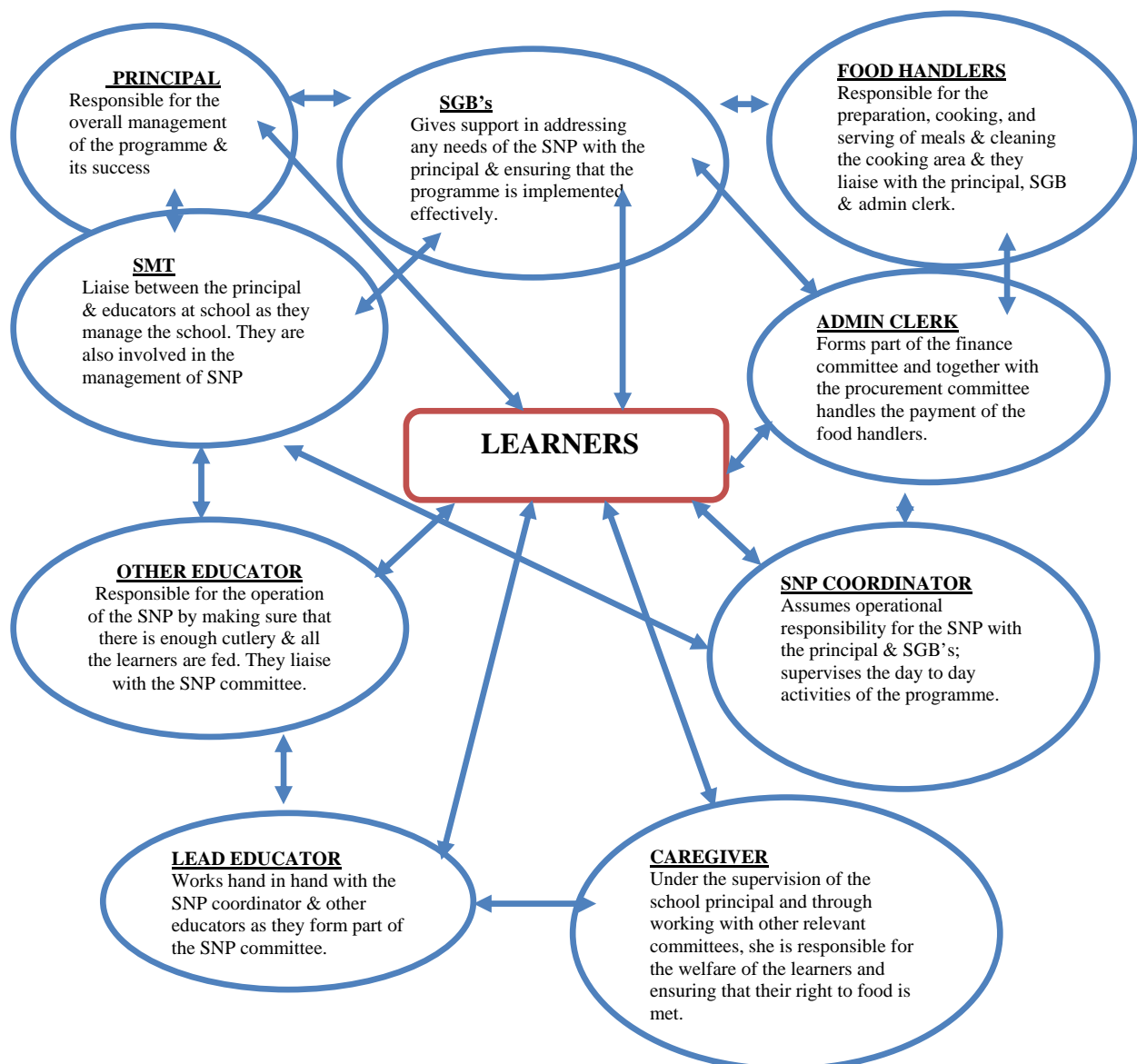


Figure 4. 1: Shows the mutual engagement between the Bushula's J.S.S. staff members as they interact in sustaining the School Nutrition Programme.

The School Nutrition Programme at Bushula's JSS is a very busy programme. Some of the people involved are the committee members but most are indirectly involved. Figure 4.1 above illustrates the interactions in the School Nutrition Programme at Bushula's J.S.S; the discussion below shows the different ways in which the School Nutrition Programme committee members work together as a mutual engagement.

The school has a garden committee composed of three educators: one from foundation phase, one from the intermediate phase and the third from the senior phase, as well as two parents from the School Governing Body to form a committee of five members. This committee helps with the garden chores such as weeding, planting of vegetables and all those garden decisions to be made at school. They decide about the date to assist in the garden and they hold meetings at the beginning and end of each month. Sometimes the educators, learners and parents also join in to help. The food handlers' job description includes the washing of dishes and cleaning the kitchen but sometimes they are also available to help in the school food garden. The educators also assist with the running of the nutrition programme as they have to supervise that all learners receive their spoons and bowls before the food handlers dish up. All the staff members at school are fully engaged in the running of the programme as shown in Figure 4.1.



Figure 4. 2: A group of learners performing volunteer work in the garden. They have volunteered to do this during their break time and after school when they do not have a lot of work. They take turns with other learners as there are not sufficient garden tools at school.



Figure 4. 3 Learners having lunch at school. They are eating pap, vegetables and chicken stew. The vegetables used in this meal were freshly picked from the school's vegetable garden.

In the following section, I make a case for these stakeholders to be considered as members of a Community of Practice. As described in Section 2.10, a community of practice is a group of people who share a common concern, a set of problems or the passion they have for a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger, et al, 2002). The members of my school's Nutrition Programme pursue a common goal, which is to improve the quality of education, improve school attendance rates, and provide temporary relief from hunger. Below, I present data that illustrates how Bushula's Junior Secondary School's Nutrition Programme has the characteristics that Wenger (1998) defined as a community of practice using three categories: mutual engagement, joint enterprise and a shared repertoire (see section 2.9.2).

4.4 MUTUAL ENGAGEMENT IN THE SCHOOL'S NUTRITION PROGRAMME

Wenger (1998) explains that one of the important features of a Community of Practice is mutual engagement, that is, a community's ability to interact in ways that develop its culture and practices (see section 2.10.2). Many of the specific characteristics associated with mutual engagement are observable in my school's School Nutrition Programme and these characteristics are outlined below:

4.4.1 Shared mutual relationships

When I interviewed the School Nutrition Programme coordinator about the role of the school's Nutrition Programme, she said that "the school has been working very well with the community so as to show mutualism" (Int.01.02.01). This is also evident when the community members volunteered to help the garden committee to work in the garden, or helped the food handlers with meal preparations and washing of dishes so as to work faster. The School Nutrition Programme had not only benefited the learners at school, but also the wider community. One of the food handlers supported this saying that, "the programme has not only benefited the school, but the community as well and this is one way of helping one another" (Int.07.01.14).

In an interview that I conducted with an educator, she said: "The learners also benefit from the School Nutrition Programme because they are getting an education and a plate of food daily" (Int.03.01.15). This has alleviated poverty levels in the community as many families have no choice in terms of their diet. The school manager further stated that, "the School Nutrition Programme also helped improve the unemployment rate in the community" (Int.05.01.13), and the procedures followed to hire these food handlers gave preference to people who were financially needy and whose learners were still at Bushula's J.S.S. The School Nutrition Programme also created an employment opportunity for three food handlers and the Garden committee members. Cooperation between the school and community demonstrated unity and, by working together, it became easier for the school and community to make decisions together on all issues concerning the programme to the satisfaction of everyone (Int.07.02.08). Many of the parents and learners volunteered to help with the gardening, dishing up and washing of dishes (Obs.03.01.01 and Int.06.02.02). This suggests that the community members maintained their relationship with the school by getting involved and volunteering in the programme.

4.4.2 Shared ways of engaging in doing things

Members of the community of practice engage in joint activities and discussions, help each other and build relationships to learn from each other. Endsley, Kirkergaard, Linares and Manag (2005) explained that, in a community of practice, members develop and share knowledge and build expertise by compiling resources, tools and strategies that support future learning for all involved. The community of practice involves practices, ways of doing and approaching things that are shared to some important extent among

members. This was evident at Bushula's J.S.S when I conducted the semi-structured interviews. The principal said: "Although I am not the coordinator of the programme, I am also involved in the running of the programme like everyone else in the team" (Int.02.01.02). Additionally, Mrs. Takayo mentioned that, "working together as the School Nutrition Programme, members will help us learn from each other" (Int.07.03.08). During my observations, I came across a group of learners helping with the garden duties (Obs.05.01.12) (see Figure 4.1) as they had volunteered to help the garden committee in their free time. The School Nutrition Programme coordinator also mentioned that: "two committee members are the garden committee members but we as the educators also help them in the garden (Int.01.01.03). The school principal also reflected similar insights when he said that, "We work as a group called the School Nutrition committee which makes decisions regarding the improvement and development of the programme (Int.02.01.04).

4.4.3 The rapid flow of information

According to Slob, Rijnveld, Chapman and Strosser (2007), flow of information is one of the human forces behind knowledge-sharing. They explained that the effectiveness of the flow of information depends on the type and quality of the relationship people have. This is echoed by Wenger (1998) who stated that communities of practice are repositories of useful knowledge which is embedded in their people's daily practices and habits.

Learners at Bushula's Junior Secondary School seem to be important contributors to the flow of information within the School Nutrition Programme's community of practice. According to one of the educators interviewed: "Children are always a very easy source to use when passing on information". It is common that when a child learns something new and interesting at school, he/she will go back home and tell the rest of the family about it (Int.02.03.07). This is how the information flowed from one person to another in the School Nutrition Programme's community of practice.

Flow of information keeps the programme fresh and running as new ideas are brought into the programme regularly. Mrs. Takayo mentioned that, "the stakeholders attend training to develop on what they already know" (Int.07.03.07).

It is important for them to improve their skills and general knowledge, as that will also make it easier to share that knowledge because they have a broader understanding of food gardening and nutrition. I observed that after the training workshops, they came back to school and shared all the new skills that they had obtained by either applying it to use or presenting it to the rest of the group (DOC.10.01).

One of the educators stated in an interview that, "... parents are always called in for workshops and meetings" (Int.01.03.06). It is not only the adult stakeholders in the School Nutrition Programme who have gained a lot from the School Nutrition Programme; the learners themselves also gained new knowledge as they are sometimes involved in such meetings.

4.4.4. Absence of introductory preambles

Wenger (1991) explained that another characteristic of a community of practice is the absence of introductory preambles, when members' conversations and interactions seem merely to be the continuation of an ongoing process which they all understand. There is no explicit evidence of this characteristic in my study's data because it was difficult to collect evidence of such interactions. During my observations, I visited the kitchen to observe the food handlers prepare the learners' meals (Obs. 05.01). The food handlers had a good connection and rapport with one another, which appeared to make it much easier for them to work together. I observed them chatting about their work as they were advising and helping each other with cooking skills. Their conversation was informal and interesting, but I found it hard to understand because I did not belong to their community of practice and thus required more introductory preambles to follow what they were saying and doing.

4.4.5. Very quick setup of a problem to be discussed

This characteristic refers to the community of practice's ability to propose solutions to problems encountered. To achieve a quick set-up and resolution of a problem, group members need to listen to one another's points of views and work collaboratively with each other.

Bushula's Junior Secondary School continued experiencing challenges related to the School Nutrition Programme that needed rapid solutions, and some of these situations

were very difficult to resolve. The number of learners at school had increased since January 2012, so the school decided to start a vegetable garden to minimise their costs as well as be able to generate funds by selling surplus vegetables (Int. 02.02.02; Int.01.02.05). However, after starting the food garden, water scarcity was a challenge (the school does not have tap water and the school is situated in a water scarce area), so the school had to hire water trucks or send people to the river to obtain water. This meant that the vegetables were not getting enough water so they did not flourish. Because of this, the School Governing body, School Management Team and the School Nutrition Committee decided to hire a construction team to build a borehole to solve this. A borehole is very expensive, costing about R120 000 to install. The school saved for two years; during that time the school avoided the traders when purchasing groceries by buying directly from wholesalers. During 2012 the school stopped selling their garden vegetables and started using them to cook for the learners. They also reallocated the money for buying vegetables to the programme's savings fund (Int.04.02.08). I consider this to be an example of how the School Nutrition Programme, working as a community of practice, was able to respond (although not very rapidly) to the major challenge of water shortages.

During the serving of meals to learners as I observed them, I noticed that a number of learners were not eating, despite being hungry. The school did not have sufficient bowls and spoons for all learners to have meals at the same time, but the committee was already in the process of buying more eating utensils. For the meantime the learners brought their own eating utensils. The idea of purchasing more eating utensils proved that they were able to respond to problems quickly. (Int.04.02.01).

Another example of the community of practice's responsiveness to problems came to light during an interview with an educator, who mentioned the issue of food left-overs being thrown away. In response, the School Nutrition Programme committee decided to identify the neediest learners so that they could take the left-over food home instead of it being discarded. (Int.03.02.05).

Together, these examples illustrate the School Nutrition Programme's willingness and ability to identify and respond to problems as they arose within their community of practice. This willingness and ability to respond exists due to what Wenger (1998) describes as 'joint enterprise', which is the focus of the following section.

4.5 JOINT ENTERPRISE IN THE SCHOOL'S NUTRITION PROGRAMME

According to Wenger (1998), joint enterprise refers to the common purpose that binds and provides a unifying goal and coherence for a community of practice's actions. Discussed below is the information about my school's School Nutrition Programme members when taking unanimous decisions about the implementation of the School Nutrition Programme.

4.5.1 Substantial overlap in participants' role descriptions

In a community of practice, everyone knows his or her role and that of other stakeholders. An illustrative example would be if a stranger asks who the coordinator of the schools School Nutrition Programme is and members direct the stranger to the same person, or perhaps when an outsider wants to know something about the School Nutrition Programme, everyone in the committee is able to respond. It is important to know everyone's roles in the programme as it makes it easy for the committee to share the activities appropriately and accordingly, because they will know who can do what. That can also save them a lot of time as they will not have to waste time appointing someone who is clueless about a specific task.

4.5.2 Knowing what others know, what they can do and how they contribute to an enterprise

Wenger (1998) stated that, "If you know what all the other members can do – that makes sharing of knowledge and appointing everyone for their own tasks to do in the team much easier". When the School Nutrition Programme committee appoints a new member, the existing committee has to hold a meeting with the different stakeholders and thereafter submit the new elected member names to the principal. He then sets up a meeting that involves all the newly appointed members to introduce them to the whole staff. For one to get appointed, he or she needs to be knowledgeable about nutrition and needs to have cooking skills (although it is not a priority for the other stakeholders besides the food handlers). To be appointed as a committee member, she/he also needs to make sure that she/he is ambitious about the development of the programme. I did not really come across any proof of these characteristics during my data collection processes, but I am sure that it was useful to the committee, especially at the implementation of the programme because they had to appoint relevant people. That would also allow more

progress in the school nutrition programme because the person would have general knowledge about that task. Time would not be wasted on training, even though it would be required at some point. When a team knows each member's abilities, it makes it easier for a member to know who to go to when there is a problem with anything, or for knowledge about a skill. Bushula's Junior Secondary school's Nutrition Programme committee knows one another's roles.

4.5.3 Mutually defining identities

There are many ways in which a community of practice develops mutually defining identities. The repertoire that is built up and shared over time by the participants, through their shared history, gives them a sense of identity and belonging. One of the ways this has occurred in Bushula's Junior Secondary School's Nutrition programme is through the uniforms worn by the food handlers.

Figure 4.4 shows a group of three food handlers wearing their uniform (green and gold). These colours match the learner's uniform at school. One of the food handlers said that, "these uniforms give them a sense of belonging and uniqueness", but besides that they mention that when working in a kitchen and using three legged pots, it can get very messy. Fortunately for them these uniforms protect their clothes from getting dirty.

The goals of the group also determine the larger structure to which they belong. The National School Nutrition Programme's main objectives are to contribute to improving the children's learning capacity, promoting self-supporting food gardens and other food production initiatives and promoting healthy lifestyles amongst learners. For my school's community of practice to achieve this, the School Nutrition Programme committee members had worked together as a team so as to achieve more together. The committee developed a food production strategy, which was food gardening, where the garden committee elicited help from the educators and learners with the maintenance of the garden. Some of the educators and learners also helped in promoting healthy lifestyle initiatives: they made posters that focused on how to live healthily. These posters were hung at school and in the community for people to look at and read.

4.5.4 The ability to assess appropriateness of actions

As the School Nutrition Programme's main aim is to alleviate hunger and improve nutrition in schools, my school found it appropriate to add fruits to the menu so as to balance the nutrients, as described in Doc. 02: National School Nutrition Programme-Guide for Secondary Schools (see also Int.05.02.05). Time management was also an appropriate and imperative action in the School Nutrition Programme because if the orders were not delivered in time, it affected the feeding of the learners. The management team at the school where the study was conducted was responsible for making sure that the orders arrived in time (Int.03.01.05).

In the kitchen and dining hall, there was further evidence that members of the School Nutrition Programme were able to assess the effectiveness of their actions and take appropriate action. For example, the School Nutrition Programme coordinator proposed "that the kitchen must be extended and improved" so that the food handlers can work in a comfortable kitchen and produce a good job (Int.02.02.05).

On consecutive days I noticed that the food handlers cooked a huge quantity of food that resulted in large amounts of left-over food that was sometimes thrown away if learners did not come back for seconds. The food handlers decided to confirm the approximate number of learners that would be served meals before preparations to avoid too much left-over food (Int.07.02.12).

There was also evidence that the food handlers had a clear sense of appropriate behaviour in a dining area, and were able to communicate that effectively to learners. Learners are usually loud and rowdy at lunch time at school because there are no educators watching over them, but they waited quietly in neat queues to receive their plates of food when the food handlers dished up (Obs.05.01.09).

I was not able to observe much evidence of ability within the School Nutrition Programme community of practice to assess the appropriateness of their social-ecological practices, shared stories and jokes, but the one incident was when I observed a parent who volunteers for the School Nutrition Programme suggest: "We need to extend our garden so that we practise crop rotation for the benefit of the soil and high production" (Obs.04.01.11).

4.6 SHARED REPERTOIRE IN MY SCHOOL'S NUTRITION PROGRAMME

Wenger (1998) explained shared repertoire to be the continual development and maintenance of a shared set of procedures, techniques, short cuts, jargon, tools, forms, symbols, mental categories, actions, concepts and shared discourse p.45. During the observations, I noticed that the food handlers had different shared sets of techniques, or shortcuts, when doing their cooking, which could make it very difficult for an outsider to join in their Community of Practice. For example, when they had to cook samp and beans for the learners, they first soaked the beans in water overnight and, when asked about this they replied that it helps them to cook the samp faster, thereby saving time.

The garden committee members also had their own set of shared practices for their gardening. The school's School Nutrition Programme is very conscious when it comes to endangering the environment, so the garden committee members had to make sure that they use only environmentally friendly products for their gardening. Many farmers or gardeners usually use chemicals and dangerous powders to kill pesticides, or chemically formulated fertilisers for the plants but the school's gardening committee used old fruit and vegetable peels and degradable waste for fertilising the soil.

The members of the schools' School Nutrition Programme Community of Practice could decide on their own way of doing things: creating representations, artefacts, and crafting their own vision, mission and policy statements and slogans. An organisation develops its own identity in many different ways. Specific tools and artefacts are regarded as one of the most important aspects of sustaining a Community of Practice for proper functioning.

Wenger (1998) further discussed that artefacts are closely linked to practice. These specific tools are part of the planning techniques for the success of the programme and they also enforce uniqueness (Wenger, 1998).

For every organisation to make progress, people involved need to get along with one another. Wenger (1998) used an organisation in his explanation, but this feature also applies in a Community of Practice because members show that they get along with each other in many ways. From my knowledge and observations of my school's Nutrition Programme as a community of practice, the members regularly shared stories, jokes and

laughter about local events. During my observations in the kitchen, they were making fun of the previous crisis with the food shortage at school as one food-handler said, “I have to be careful today. It was a very bad situation yesterday when we ran short of food before all the learners could eat”. They all burst out in laughter as they looked at each other (Obs.06.05).

Jargon or shortcuts are abbreviated ways of referring to certain people, things or processes. Frequent use of jargon indicates that the group of people know their shared context and experiences very well. I observed an instance of this when one of the garden committee members said, “We have to approach the Boss first” instead of calling him by his name or his title as the school principal. Everyone present laughed because they knew who she was referring to and luckily the principal was not there (Obs.04.01.17).

This was evident in one of the unplanned observations, when I overheard one of the food handlers being confronted by the School Principal about her coming to work late. She then explained, saying that, “No Sir, I went to ‘Dube’s’ up the road to get a loaf of bread because we did not get a chance to have breakfast in the morning because we came early. The food handler mentioned going to ‘Dube’s’, which is a tuck shop near to the school where most of the learners and food handlers buy their lunches. The learners refer to the name ‘Dube’ because the owner’s name is Langelihle Dube, so they used his surname to refer to the tuck shop.

Many organisations or groups of people have certain styles or ways of behaving that show their membership to a certain group. As described in Section 4.4.3 under ‘shared mutual identity’, the food-handlers in Bushula’s Junior Secondary School wore a uniform when preparing meals (see Figure 4.4). The colours of this uniform resembled the learners’ school uniform and so one can easily recognise these food-handlers as belonging to the school’s Nutrition Programme Community of Practice. The food handler’s uniform was the only items of clothing that displayed membership of the School Nutrition Programme as the programme did not have a logo or a slogan. When I asked one of the food handlers how they felt about their uniform, she said that it was not easy for them to wear the uniform at first because people would laugh at them, especially the learners, who said that they have copied their uniform. However, the uniforms are

now accepted as normal outfits for food-handlers to wear and the women appreciate them because the uniform helps them to keep their clothes clean (Int.07.01.05).



Figure 4. 4: Bushula's School Nutrition food-handlers in their uniforms.

During this study, I was able to identify three examples of shared discourse within the School Nutrition Programme. Dryzek (2006) suggested that discourses are social structures that both enable and constrain actions. He further stated that some discourses have a dominating influence on individuals or a group of people in the sense that they are so ingrained in social structures that they are not recognised by those subject to them, but are instead treated as the natural order of things p.24-25.

- **A discourse of the School Nutrition Programme reducing absenteeism:** The committee members believed that there is a relationship or link between the School Nutrition Programme and the attendance of the learners. When interviewing the School Nutrition Programme committee members, I asked them, “What changes have been made to the school and community through implementation of the School Nutrition Programme?” Many of the interviewees, such as the School Nutrition Programme coordinator, the school principal, three educators and three food handlers all spoke about the School Nutrition Programme in terms of how much it improved school attendance. The School Nutrition Programme coordinator said, “Before this programme was implemented, the school attendance was very low and I think it was because many children had to stay at home and fend for food” (Int.01.01.05). One of the educators also responded that, “Absenteeism is one of the huge differences that have happened in our school after the implementation of the programme”

(Int.03.01.06). Another educator also gave evidence of this shared discourse by explaining during an interview that she had really seen a huge difference in school attendance since this programme started (Int.05.01.04).

- **A discourse of the School Nutrition Programme leading to improvement of the physical environment** I asked the committee members what plans they had to improve the School Nutrition Programme. Three members of the committee were mostly concerned about factors that affect the natural environment. An educator said, “The idea of building a dining hall was in process as the dining hall will also help minimise littering around the school yard, as we are also encouraging an ozone-friendly environment” (Int.01.02.07). The school manager also had the same idea of building a dining hall (Int.02.02.08). During an observation in the garden, one of the parents warned the rest of the School Nutrition Programme committee members about the use of insecticides and fertilisers in the garden, informing them that this endangers the environment. During one of my observations, I heard the School Nutrition Programme members talking about the idea of extending the food garden and one of the parents added that this extension would also help them practice crop rotation, which is very good for the soil’s fertility.
- **A discourse of the School Nutrition Programme influencing learner psycho-social support.** Every child needs care and support to be able to learn and children from very poor communities require additional support. The Department of Basic Education also noticed that many learners in schools go hungry, they are not safe, do not have proper hygiene and abuse drugs. The Department of Basic Education then initiated a programme called the Care and Support for Teaching and Learning. The aim of this programme was to create an enabling environment to improve learning outcomes. At Bushula’s J.S.S the School Nutrition Programme, together with the Health Advisory Committee (HAC) engaged in some positive activities such as handing out food parcels from the School Nutrition Programme and the food garden surplus every end of the term. The wellness room is used for private meetings between the learners and a Learner Support Agent (LSA). The main objective of these meetings is to provide the

learners with opportunities to discuss their personal problems, which commonly include not having enough food at home.



Figure 4. 5: Learner Support Agent is preparing a bath for a neglected child with sores all over their body.



Figure 4. 6: Learner Support Agent is counselling a learner that is not physically fit and cannot cope with the social problems.

4.7 PHASE TWO OF DATA ANALYSIS: THE PRODUCTION AND SHARING OF KNOWLEDGE IN THE SCHOOL'S NUTRITION PROGRAMME

4.7.1 Introduction

This section responds to sub-question two of the study as stated in chapter one (See section 1.4): “What kind of knowledge is produced and shared in this community of practice?” I present data that is relevant to understanding how knowledge associated with community-based environmental learning was produced and shared in my school's nutrition programme. As discussed in Section 2.7.2, I consider different types of knowledge such as explicit, tacit, declarative, procedural, causative and contextual

knowledge as suggested by Lubit (2001), Vorwerk (2004d), Eraut (2000), Nieuwoudt & Monteith, (2008). This section is based on Analytical Memo 4 (Appendix A10) in which I extracted and summarised evidence from the raw data of these various types of knowledge. I considered each type of knowledge in relation to three focal points which I had identified as fundamental to community-based environmental learning in a context of poverty and malnutrition: (i) knowledge about nutrition; (ii) knowledge about food gardening; and (iii) knowledge about socio ecological relationships.

4.8 EXPLICIT KNOWLEDGE PRODUCED AND SHARED IN THE COMMUNITY OF PRACTICE

4.8.1 Explicit knowledge about nutrition

Explicit knowledge is that kind of knowledge that is already known and can be put into words or graphically presented. This means that explicit knowledge can be shared formally (see section 2.11.2). Data from this study suggested that explicit knowledge about nutrition is mostly produced outside of the community of practice (for example by the developers of educational resources) and is mostly shared through curriculum-linked, classroom activities.

The school nutrition programme coordinator seemed to be aware of the school's potential (even its responsibility) to share explicit knowledge about nutrition; she said in an interview that: "People learn by example" so, as a school, they needed to be very good examples to everyone else in school and around the community (Int.01.03.09). She added that explicit knowledge about food nutrition was also shared in the classroom when the learners were assigned curriculum-related tasks. of this kind of explicit knowledge being more widely circulated for others' benefit were the bright and bold posters about healthy eating that the Grade Nine learners made during their Life Orientation lessons in term one. During that term, the Grade Nine learners and their educators had organised a once-off event on a Friday afternoon to distribute the informative posters they had made on the theme "HEALTHY LIFESTYLE" to the community.



Figure 4. 7: Grade 9 poster showing Healthy Food Practices under the theme “healthy lifestyle”.

The sharing of explicit knowledge about nutrition was therefore not limited to classroom activities, and their teachers recognised their responsibility to support learners as much as possible to live a healthy lifestyle (Int.02.03 07 and Int. 03.03.02). The coordinator responded in an interview that, “Learners take back home the information they have acquired at school and use it to show their parents the importance of eating healthily” and that “...learners pass on the knowledge learnt at school about nutrition to their families (Int.01.01.21) and (Int.03.02.11).

Explicit knowledge about food and nutrition was also circulated by other members of the School Nutrition Programme’s community of practice. For instance, the School Nutrition Programme committee organised occasional cooking workshops for all the food handlers to improve their cooking skills. I was able to observe a workshop for the food handlers after school on 24 April 2012, which was organised by the programme coordinator. The theme on that day was “Germs in the kitchen” (Obs. 01.01.01) when the discussions centred on keeping the kitchen clean to prevent food-borne diseases. They used the Generic Training Manual (Doc 02) as their source of knowledge. After the coordinator’s introduction, the food-handlers were tasked with identifying ways to prevent food-borne diseases. One food-handler suggested soaking the green vegetables before they are cooked but another asked, “Will that not somehow drain out all the nutritious juices?” The discussion continued unresolved until the coordinator promised to research that idea

and return with the findings at the next gathering (Obs.01.01.19-20). Another food-handler suggested that food-borne diseases could be prevented by washing fruit before eating or cooking, regardless of whether it is fresh from the garden or from the supermarket. Another said, “We need to heat or boil river water before drinking and our hands need to be washed before handling food (Obs.01.01.12). This showed that, throughout the training sessions and workshops, explicit knowledge about food nutrition and hygiene was circulated between the committee members.

During an interview, the School Nutrition Programme coordinator said that, “I learnt the importance of nutrition/healthy balanced diet through the School Nutrition Programme and then decided to start my own family garden at home because this will not only help improve my health but I will also save because I will not have to buy vegetables” (Int.01.02.19). This demonstrated that, through her involvement in the programme, the coordinator gained explicit knowledge about nutrition.

4.8.2 Explicit knowledge about food gardening

Knowledge about food gardening is often tacit and experiential, learned through observing others. However, as described in this section, explicit knowledge about food gardening can also be learned through formal educational processes. Meetings and workshops appeared to be the way that explicit knowledge about food gardening was shared in Bushula’s J.S.S. It is very difficult to formally teach a person how to do gardening but the garden committee members gained a lot of useful knowledge through workshops.

During an observation I had with the garden committee members, the committee was having a meeting about the extension of the school food garden. The committee wanted to extend the garden because the number of learners had increased, which meant they required more produce. During the meeting, one of the garden committee members shared with the rest of the School Nutrition Programme members that “crop rotation is a benefit to the soil and it also improves production”. This can be referred to as explicit knowledge because it was shared in a formal situation during a meeting.

The garden committee shared a lot of information amongst themselves about crop rotation and what to use to kill garden pests (Obs.03.01.15 and Obs.04.01.11&12). For

example, when one of the garden committee members proposed extending the school food garden, a parent added that “this will also help us practice crop rotation for the benefit of the soil and high production” (Obs.04. 01.11). The food garden at my school was also endangered by insects and the garden committee needed to come up with solutions to the problem, as the plants were dying. One of the garden committee members suggested that they must request the school principal to purchase an insecticide; others suggested a pesticide by the name Blue Death Insect Killer Powder but another educator suggested that they must look for an insecticide which would not be harmful to plants and the soil (Int. 04.01.16). Using insecticides and pesticides on plants could have both negative and positive consequences. The positive being that the insects would be prevented from eating the plants and causing them to rot. The negative being that some insecticides are not good for the environment because of harmful chemicals they contain. This happens when pesticides suspended in the air as particles are carried by the wind to other areas, which can also pose a threat to wildlife. Pesticide exposure is associated with long term health problems such as respiratory problems, memory disorders and depression.

The school manager emphasised that the learners needed to go home and share “what” they were taught at school. He even added that he himself had never had a garden of his own, but after the implementation of the programme he started his own garden (Int.02.03.08 and Int.02.03.16). Many community members also decided that they should start their own vegetable gardens after observing what changes the vegetable gardens at school were bringing about (Int.01.02.02).

The food garden at my school is vulnerable to insects and the garden committee needed to come up with solutions to the problem as the plants were dying. One of the garden committee members suggested that they must request the school principal to purchase an insecticide; some suggested Blue Death Insect Killer Powder but an educator suggested that they must look for an insecticide which will not be harmful to plants and the soil (Int. 04.01.16). In another observation, one of the parents who volunteers in the garden noticed a cut-worm which damages cabbage seedlings. One of the members suggested the use of the insecticide called ‘Blue Death Insect Killer Powder but an educator motivated instead for “a very strong insecticide which is called ‘Karate’. They all agreed

to use Karate as it would not be harmful to plants and would not be expensive (Obs.04.01.11).

Although this incident is an example of the sharing of explicit knowledge about food gardening, it also reflects its limitations; the parents and teachers were knowledgeable about the availability of products and their effectiveness, but they seemed not to have more in-depth, scientific knowledge of the socio-ecological risks associated with these chemical compounds. Links between the use of agricultural pesticides and negative environmental and human health effects has been widely researched and documented. For instance, Heeren, Tyler and Mandeya (2003), reported that in the Eastern Cape Province of South Africa, “women exposed to chemicals such as pesticides, ‘Blue Death’, and organophosphate were more than six times as likely to have babies born with birth defects as were those exposed to no chemicals”. Quinn et al (2011) summarised various South African scientific studies to report that, “pesticides have been detected in wild bird species as well as in indigenous fish species, indicating pesticide contamination within various habitats. This is a particular concern due to the health risks associated with many pesticides”. Similar to ‘Blue Death’, the insecticide ‘Karate’ (a parathyroid insecticide), is also associated with human and ecological risks. ‘Karate’ is toxic to fish, other aquatic organisms and wildlife. It is highly toxic to bees, which play a vital role as pollinators of food crops and other plant species. Oti and Nwani (2007) concluded their study on the effects of ‘karate’ on young freshwater fish by advising users “to be cautious on the use ... of this insecticide as its misuse may affect the hydrodynamics and stability of ambient water quality and the aquatic life therein”. The apparent lack of access to this kind of knowledge about pesticide use is of relevance to the third area of explicit knowledge which I review in this section: explicit knowledge about social-ecological relationships.

4.8.3 Explicit knowledge about social ecological relationships

Many challenges that community members are faced with are social-ecological in nature because they affect the quality of people’s lives, and their practices in relation to natural resources and the functioning of ecosystems. For example, there are no water taps in the area surrounding Bushula’s Junior Secondary School, due to the fact that it is a rural area. This requires people to have to get water from the river. Commonly, the river is polluted with litter and might not, therefore, be healthy for people and animals to drink. During winter there is no water at all. Limited access to water means that people cannot water

their vegetable gardens, which many families rely on to survive. This is a stark illustration of how access to the natural resource of water, which is also a basic human right, affects cycles of poverty and communities' resilience to poverty.

Similarly, people living in the area around Bushula's JSS are dependent on the soil and its quality for their wellbeing and livelihoods. Bushula's J.S.S is situated in a rural area where many of the families are poverty-stricken due to different reasons, such as increasing unemployment and death rate due to different diseases in the community. Many people in this area depend on food gardening for survival; some of these families use the produce for consumption and other families decide to sell the produce for an income. Water is very scarce in this community, such that sometimes the rivers and dams dry up and leaves the soil in a very bad state, which affects the farming in the area.

There were few examples of explicit knowledge being shared about these social-ecological relationships, but when it was shared, the knowledge was often limited, as illustrated above in the example of people's choice of pesticides. Another example of how knowledge about social-ecological relationships is often explicit yet inaccurate or superficial came to light during an interview with a member of the School Nutrition Programme Committee. Discussing the future plans of the Committee, the member said, "The dining hall will also be a good way to minimise the littering at school (Int.01.02.08) as litter is one of the causes of pollution, air pollution and water pollution. It is unclear how a single dining hall can cause or reduce air and water pollution.

Social-ecological relationships can also be described as the view that environmental problems arise from fundamental social problems, and that they cannot be understood or solved without dealing with problems within society, including economic, ethnic, cultural and gender conflicts. The community where Bushula's J.S.S is situated is faced with environmental issues such as poverty, crime and unemployment in particular. So, every Thursday of the week the community members usually meet at the chief's homestead where they sit together and discuss all these issues and try to come up with solutions to these social problems. On this day I was lucky enough to be aware of the meeting for observation- the community members were at the chief's homestead to discuss issues such as crime and unemployment (Obs.02). Although their discussions were not directly about the social-ecological issues, one of the garden committee members told the rest of

the team that, “having a bigger garden will help them practice crop rotation and this will increase production” (Obs.04.01.11). The garden committee member advised the School Nutrition Programme members about practising crop rotation as this is a way of preventing soil erosion, so in a way this affects the life cycle as some plants depend on plants for survival. This example can be referred to as declarative knowledge about social ecological relationships.

A group of volunteers working in the garden (two parents, the garden committee and the school care-giver) discussed the issue of asking the school principal to extend their food garden. One parent said in isiXhosa, which is her mother tongue, “*Lento yokwandisa igadi izakusinceda sitshintshanise izityalo ukuze umhlaba uxhamle ze sizuze nesivunu esiphezulu*” [This will also help us practice crop rotation for the benefit of the soil and high production] (Obs.04.01.11). Crop rotation is the moving around of plants and not planting the same kind of crop in the same plot every season, which can lead to soil erosion. Crop rotation improves soil fertility, which in turn leads to increased food production.

4.9 TACIT KNOWLEDGE PRODUCED AND SHARED IN THE COMMUNITY OF PRACTICE

4.9.1 Tacit knowledge about nutrition

Brockman and Anthony (1998) stated that tacit knowledge cannot be taught, trained or educated – it can only be facilitated pp. 204-222. As discussed in section 2.12.2, tacit knowledge is shared or produced informally. As stated above, tacit knowledge is shared informally compared to explicit knowledge. Local knowledge can be regarded as tacit knowledge because it can be shared unknowingly and informally.

It was lunch time and the food handlers were serving lunch as usual when a Grade one learner complained to a food handler saying, “that at school we do not pray before having meals yet we do it at home (Obs.05. 01.12). During that same mealtime, another food handler shouted at one of the learners saying, “sit down when having meals, because many people believe that you do not get full if you eat whilst standing and it is rude to eat standing in the African culture” (Obs.05.01.19). This scenario demonstrated tacit

knowledge being produced and shared. The other learner shared knowledge informally to the rest of the learners without him even being aware of this.

Tacit knowledge is shared unconsciously and informally, as is evident in Lutho's case when one of the learners reported to a food handler that Lutho did not wash his hands before eating. The boy said, "Miss, Lutho did not wash his hands" and Lutho responded by crying saying that "I do not have germs". Lutho was unaware that the other learner was actually informing him that one must wash one's hands before handling food, and Lutho's response was tacitly reinforcing the knowledge that unwashed hands may carry germs. This knowledge about the relationship between germs, hand-washing and eating thus appeared to be tacitly held knowledge within this community of practice because the teacher, Lutho and the boy who reported him had a commonly held understanding of the relationship.

4.9.2 Tacit knowledge about food gardening

Tacit knowledge is practised, imitated or observed and an educator supports this statement by stating that, "People learn by example" (Int.01.03.14). Through the implementation of the School Nutrition Programme at my school, since 1996, many people around the community finally observed the importance of starting their own vegetable gardens. The programme coordinator verified this saying that, "Parents and learners go back home and start their own vegetable gardens" (Int. 01.16). Even the school principal mentioned that the one thing he obtained from the implementation of the programme was the importance of starting your own vegetable garden (Int. 02.03.14). A food handler added, "I obtained garden skills through helping the garden committee (Int.08.02.16). Another food handler said, "I have also learnt that there are other ways of doing vegetable gardens such as drawing from the indigenous practices which are in line with the environmental education and that the programme has basically helped me improve my health life for the better" (Int.07.03.16-17). One of the food handlers added, "I have also obtained a lot of garden skills through helping in the garden, and cooking skills". All these examples provide evidence of how knowledge, skills and values associated with food gardening had been tacitly developed over the years through demonstrated practices, direct experience and a shared discourse of support for food gardening.

4.9.3 Tacit knowledge about social-ecological relationships

Poverty is a very serious issue in my school's community and is therefore a priority for the staff. All members of the school nutrition programme's community of practice recognise the importance of vegetable gardens in addressing the challenge of poverty and malnutrition. For example, one educator told me that she hoped learners would "go back home and start their own vegetable gardens so as to reduce poverty in the community" (Int.01.02.16). Similarly, the school principal said: "Everyone in the community is taught almost everything about nutrition so we as educators and everyone else in the programme need to find a way of informing them about nutrition and hygiene and everyone needs to start their own vegetable gardens so that they eat fresh vegetables without having to buy them" (Int.03.02.18). One of the parents told me in an interview, "I have learned a lot through working with this programme, such as sustainability. We need to make sure that we do not over-use resources, we need to keep for later use, and this goes with recycling. You do not need to buy fertilizer to fertilize soil. Using peels and any rubbish besides plastics can also be used as fertilizers" (Int.08.02.6-9). The Principal said that, "I have also learnt that there are others doing vegetable gardens, like drawing from some indigenous practices which are in line with environmental education" (Int.02.15). One of the parents said, "We need to make sure that we do not over-use resources we need to keep for later use, and this goes with recycling. You do not need to buy fertilizer to fertilize soil; using peels and any rubbish besides plastics can also be used as fertilizers" (Int.08.02.6-9).

One member of the School Nutrition Committee members described an incident that I would identify as an example of tacit knowledge about people-nature relationships within the community; she explained, "I remember when we had a problem with ants, one of the parents from the committee advised us to put fat in an empty bottle and lay it open in the garden and once the ants are caught in, we should throw the bottle far away from the garden" (Int.09.03.13). Other than this single example, I did not encounter other examples of tacit knowledge about the relationship between the natural environment and people's health.

4.10 SKILLS

4.10.1 Functional skills

Skillscan (2013) & Toby (2012) defined functional skills as skills based on a person's ability and potential to acquire new skills. As such, they do not need to be learnt through formal education. Generic examples of this skill are: organizing, planning, communicating, managing and problem solving (see Section 2.13.2).

During my observations, I noticed that there are some functional skills produced and shared in the garden committee. Some of the educators, parents and learners *volunteered* to help in the garden during their free hours and I observed that some of them knew very little about gardening techniques, but through observing others they were able to learn relevant skills.

In this study, some members of the SNP community of practice recognised that they had acquired a number of skills. I was interviewing one of the educators about relevant knowledge which could improve the School Nutrition Programme. In her response she said, "I think management skills are very important when running a business, because the actions and decisions taken depend on management skills". Businesses or organisations with bad management usually do not succeed or they make slow progress and, through participating in the implementation and running of the School Nutrition Programme, she stated that she had also acquired all these skills. (Int.03.02.14). The school principal responded saying, "I acquired management and listening skills from the School Nutrition Programme". He believed that these skills were very important for him as a leader (Int.01.02.17). The School Nutrition Programme coordinator and another educator admitted to having learnt budgeting skills so as to save money and not spend on unnecessary things (Int.02.02.11 & Int.04.02.13). I asked one of the educators in an interview what knowledge and skills she had acquired from the School Nutrition Programme. She identified communication skills, as well as being respectful and a good listener. She also stated that these skills are important when working as a member of a group such as the School Nutrition Programme (Int.04.02.13).

4.10.2 Knowledge-based skills

This type of knowledge is of specific subjects, procedures and information needed to perform a task and is generally acquired through education and training. Knowledge-based skills are very education orientated (Skillscan, 2013) (see section 2.13.2). When I asked a food handler about the skills she had gained from the programme, she said, “I acquired gardening skills through helping the garden committee when I was not busy cooking. I also used the garden skills to start my own vegetable garden at home so this can help show the community members the need to start their own vegetable gardens” (Int.08.03.15). During the meeting I had with the school principal, he said that the garden committee also needed to take the gardening skills they had obtained through the programme to the community so they could also use these skills to improve their lifestyles (Int.02.02.14).

4.10.3 Personal traits

Skillscan (2013) described personal traits as skills that are developed from childhood and throughout a person’s life experience. Such skills influence how a person conducts themselves and, hence, the kinds of activities they get involved with. This type of skill mainly refers to one’s self-esteem and feelings (see Section 2.13.2). When working as a team with the same goal in mind, respect for one another is a priority. Some of the members said that they had learnt how to work in a team without forgetting respect for one another (Int.01.02.22, Int.02.02.17 & Int.04.08.20). During an interview with one of the educators in the School Nutrition Programme Committee, she said, “... before joining this programme I was not very confident – I was a very reserved and withdrawn kind of person and I never expressed my feelings or any ideas I had about a situation; but after being part of the School Nutrition Programme I can now voice out my views and be able to listen to other people’s views”. She added that the School Nutrition Programme helped her develop her self-esteem (Int.04.03.16). One of the educators interviewed also added that, as a person, you need to be confident with whatever you do as the question was about “What knowledge have you already gained in the implementation of the School Nutrition Programme (Int.03.03.18).

4.11 PHASE THREE OF THE STUDY: LEARNING IN A SCHOOL NUTRITION PROGRAMME'S COMMUNITY OF PRACTICE

The previous section presented data on the kinds of knowledge and skills produced and shared in the school nutrition programme's community of practice. This section presents data about *what members learned* through their involvement in the School Nutrition Programme, and *how they learnt it*. Below is sub-question two of the study and its related goal to which this section responds.

- How is learning taking place in this community of practice?

Related Goals: (i) to identify how knowledge is shared between the members in the community of practice. (ii) To identify ways in which to support more learning in the community of practice to enhance food security in ecologically sustainable ways.

4.11.1 How do they learn?

Knowledge can be shared in many different ways: formally or informally, verbally or non-verbally, intentionally and unintentionally. In my school's School Nutrition Programme, knowledge was shared through training and workshops. Educators also shared a lot of knowledge through their lessons and through informal social interactions, as discussed below. This section takes a more detailed look at different ways in which the people involved in the School Nutrition Programme gained the knowledge that they required.

- **Meetings, workshops and training sessions:**

The first workshop that I observed was on 24 April 2012 at Bushula's J.S.S at 13h30. This meeting was a follow up of the district workshop, so the coordinators had to return and conduct the workshop with the food handlers. This workshop was held between the School Nutrition Programme coordinator and the food handlers. It was about "The do's and don'ts in the kitchen' under the theme 'Germs in the kitchen'. The School Nutrition Programme coordinator first gave the food handlers an introduction about the theme of the day, which was followed by a discussion about how germs develop and how to prevent food borne diseases. During this workshop the food handlers were given an activity with questions based on the theme of the day, such as the causes of germs in the kitchen and how to prevent germs in the

kitchen (Obs.01.01). The food handlers first discussed these questions as a group and then presented their findings. In their presentation they mentioned that germs are caused by uncleanness such as leaving food uncovered, not washing dishes or dirty dishcloths left lying around. To prevent germs one has to make sure one washes one's hands regularly and to disinfect the sink and drain regularly to kill the germs. Through the discussions and the asking and answering of questions, knowledge was produced and shared within a group.

In the School Nutrition Programme meetings I observed that learning took place. I attended one of the schools' School Nutrition Programme meetings, which was held on 13 October 2012. The agenda of the meeting concerned the maintenance of the kitchen at school. The coordinator and the food handlers raised the idea of extending the kitchen because it was very small for them to cook in as the number of learners had increased. The coordinator supported the idea of increasing the size of the kitchen by reporting that, in a workshop she had attended, she learned that working in a small kitchen increased the chance of germs developing and also aided the spreading of food borne-diseases. (DOC.05.01.07). This is an example of how, through the discussions throughout the meeting, knowledge was produced and shared between the School Nutrition Programme committee members.

Another meeting was held on 14 March 2012 at Bushula's J.S.S. This meeting was about the recruitment and training of new food handlers. The first half of the meeting was about the recruitment of two new food handlers, as an existing one was still willing to remain part of the committee. The whole committee was involved in the recruitment of these two food handlers and they were also present at the meeting. After the meeting, the whole committee joined the School Nutrition Programme coordinator, where she was providing training for these food handlers. The food handlers were taught about time management and, since this work is of a voluntary nature, the importance of cleanliness, cooking tips and ideas on living a healthy lifestyle were taught as they had to make sure that they prepare healthy meals for the learners (DOC.10.01.10). During the training, knowledge was shared with the food handlers by the coordinator.

The parents and other stakeholders were invited for workshops at the school, which were conducted by the schools' School Nutrition Programme committee members

(Int.01.03.06). During these meetings, or workshops, the people involved discussed the problems faced by the programme and healthy lifestyle tips were shared. Through the discussions and the asking of questions, knowledge was produced and shared. The meetings were formally conducted but the members were able to relax and be comfortable at the workshops. The community members were also not deprived from the opportunity for gaining new knowledge. During the workshops and training sessions, the knowledge produced and shared was of a practical nature. Parents and educators, for example, were taught how to cook different food types and they even went to the garden to share with one another different ideas about gardening. The parents and other committee members learned through observing during the training sessions.

- **Curriculum and classroom-based activities**

Knowledge about the schools' School Nutrition Programme Community of Practice was also shared in the classroom. The educators were directed to try and include the theme in their lessons. During one of the observations I carried out at Bushula's, I was able to observe a Grade 9 class during a Life Orientation period. The educator started off by introducing a new theme to the learners, which was "Healthy Lifestyle". After a discussion with the rest of the class, she gave them an activity. The learners were given the opportunity to develop their knowledge and skills as they were given a project to design posters about a healthy lifestyle (Int.01.02.20 & Int.06.03.01). Through doing these assignments and projects the learners acquired knowledge because they had to do some research on the topic to be able to complete these tasks. The learners were also fully involved in the programme, which exposed them to new skills and knowledge. The learners also had the responsibility of creating informative posters about living a healthy lifestyle, gardening and cooking skills that they displayed around the school and community. They also started their own environmental magazine.

- **Informal social interactions**

The community members meet almost every weekend at social gatherings, which are usually funerals, weddings, stokvels or just any other traditional ceremony. Such meetings give them the chance to share their knowledge and skills with one another; women usually gather together to share knowledge and observe one other's activities (Int.07.03.06). Bushula's J.S.S prepared an indigenous breakfast during an awareness

campaign about the initiation of the boys. During the preparations of the breakfast knowledge, such as cooking skills and healthy lifestyle tips were shared between the parents, educators and the schools' School Nutrition Programme members.

4.12 CONCLUDING SUMMARY

Phase One of this study discussed features of my school's School Nutrition Programme that identified it as a Community of Practice, as described by Wenger (1998). Phase Two of the study focused on the types of knowledge learnt, produced and shared in this Community of Practice regarding nutrition, food gardening and social-ecological understandings: tacit and explicit knowledge. Explicit knowledge can be articulated and shared individually and across an organisation, whilst tacit knowledge is very difficult to transfer explicitly, but is rather learnt through observing and participating.

Phase Three of the study responded to the research question about how the types of knowledge discovered in Phase two are learnt. Based on the participants' responses, I discovered that they learn through meetings, training sessions and workshops. The learners are given curriculum and classroom activities and some of the community members also meet up for informal social gatherings to share knowledge amongst themselves.

CHAPTER 5: AN IN-DEPTH VIEW OF ENVIRONMENTAL KNOWLEDGE-SHARING AND LEARNING INTERACTIONS

5.1 INTRODUCTION

This chapter draws on the data presented in Chapter 4 with a view to gaining deeper insights into the issue of environmental learning in Bushula's Junior Secondary School's Nutrition Programme. In this chapter, the qualitative case study data presented in Chapter 4 is reconsidered and discussed in terms of Wenger's (1998) theory of learning in communities of practice, as well as perspectives on social learning and forms of knowledge. Discussion of the data within this theoretical framework provides useful insights into interacting factors and processes influencing social learning in relation to environmental sustainability and food security within the school nutrition programme. A particular focus of this chapter is on how knowledge related to environmental sustainability and food security is produced and shared within the community of practice.

These discussions are presented in response to the study's research question: "An exploration of the School Nutrition Programme's potential to catalyse community-based environmental learning". As described in Chapter 1 (see section 1.4), the study aims to:

- Understand the various partners of the School Nutrition Programme, their roles and areas for possible action at school related to environmental learning and food security.
- Identify the kinds of knowledge related to environmental learning and food security that occur and are shared within the community of practice.
- Identify the types of skills relevant to environmental learning and food security that are developed and shared within the community of practice.
- Understand how learning takes place and identify ways to support more learning in the community of practice to enhance food security.

Analysis of the study's data was conducted in three phases (as described in Section 3.5). Phase 1 of data analysis commenced in Chapter 4, where I started to draw meaningful conclusions relevant to Sub-Question 1 ("How is the School's Nutrition Programme operating as a Community of Practice?") and its related goal (To understand the various partners of the School Nutrition Programme, their roles and the areas for possible action

related to environmental learning and food security). Phase 1's analysis was based on Wenger's (1998) characteristics of Communities of Practice which, in general terms, refer to (i) mutual engagement, (ii) joint enterprise, and (iii) shared repertoire. Through the data presented and discussed in Chapter 4 (in particular Section 4.4), I was able to ascertain that Bushula's Junior Secondary School's Nutrition Programme is indeed functioning as a community of practice. My use of the term 'community of practice' when referring to the school's Nutrition Programme in subsequent chapters is thus substantiated and evidence-based.

Phase 1's analysis presented in chapter 4 also laid the foundation for responding to Sub-Questions 2, 3 and 4, as will be discussed later in this chapter. Data analysis from Phases 2 and 3 have enabled me to construct the following five findings, which I will discuss in detail in Sections 5.2 – 5.6:

- FINDING 1: Participating in a Community of Practice creates a platform for social learning.
- FINDING 2: In Bushula's J. S. S.'s School Nutrition Programme, explicit knowledge is more common amongst those in formal leadership or educational roles, whilst local, contextualised and tacit knowledge predominates amongst parent volunteers and food handlers.
- FINDING 3: Participating in the School Nutrition Programme provides opportunities to develop skills relevant to sustainable food cultivation, nutrition and basic management.
- FINDING 4: Social-ecological knowledge related to food cultivation is contextual and experience-based in the School Nutrition Programme's Community of Practice.

5.2 AN OVERVIEW

This section discusses Findings 1-4 listed above, thereby responding to sub-questions 2, 3 and 4 of the study, which are:

- What kind of knowledge is produced and shared in the community of practice?
- What skills are developed and shared in this community of practice?
- How is learning taking place in the School Nutrition Programme's Community of Practice?

FINDING 1: Participating in a Community of Practice creates a platform for social learning.

As discussed in Chapter 2, Lave and Wenger (1991) explained that the learning that occurs in a Community of Practice is social learning, and that it is socially constructed and influenced by social and cultural values (see Section 2.11.2). Wenger (1998) later builds on this to propose that communities of practice are the building blocks of any social learning system because they enable people to engage with the community and be trusted as people who are willing to participate in the given interaction (see Section 2.11.2). When considered in relation to environment-oriented learning, social learning can be viewed as a combination of both action and reflection processes when groups collaborate to improve the management of interrelationships between social and ecological systems (Keen et al, 2005, p.4). This study has shown that Bushula's J.S.S's School Nutrition Programme not only operates as a community of practice (see Section 2.9.3), but that the community of practice creates a platform for social learning processes that may enhance long-term food security and community-based environmental learning.

The study showed that the School Nutrition Programme is also a community of practice and was identified as a poverty alleviation strategy that was introduced to contribute to the alleviation of poverty in primary schools. Amongst its objectives, the School Nutrition Programme has helped improve knowledge in terms of nutrition, attitudes and eating patterns of the learners, parents and teachers through knowledge sharing.

The study has shown that, in the School Nutrition Programme, people acquired both informal and formal knowledge through social learning processes that occurred in various

ways during meetings, training workshops, classroom lessons, work-related conversations and interactions with the community members. Wenger (2010) explained that social learning in communities of practice can either be formal or informal: informal learning deals with exchange of stories, whereas formal learning involves formalised activities such as systematic collection or presentation of information. From these interactions, people build relationships which allow them to further produce and share knowledge. As described in Chapter 4, workshops and presentations associated with the School Nutrition Programme served as catalysts for change in several community members' lives by motivating them to start their own vegetable gardens at home and/ or improve their diets (see section 4.4.3).

Additionally, data presented in chapter 4 indicates that when the food handlers of the School Nutrition Programme attended a workshop at Bushula's J.S.S coordinated by the School Nutrition Programme coordinator, they learnt how to prevent food-borne illnesses and how to keep their kitchens clean. During interviews with the participants, these food handlers indicated that the knowledge gained through such interactions is shared more widely in the community, for example, they meet up at funerals, weddings and parties where food is discussed and prepared. They also reported that they have weekly meetings at the chief's homestead where they discuss their social issues and come up with solutions. Such interactions are strong indications, firstly, that the community and the school produce and share knowledge related to food security, health and nutrition and, secondly, that the School Nutrition Programme creates a platform for such learning.

The Natural Science educator had a discussion with the learners about the names and uses of the indigenous plants in their garden. During the discussion they came across a plant that they could not identify. Fortunately one of the food handlers was walking past the class, so the educator asked her to identify this indigenous plant and its use. The learners, educator and the food handler had a fruitful discussion as the food handler told them that the plant is an "aloe", commonly known as "ingcelwane", and it is usually used for medicinal purposes such as healing a new-born baby's navel (See section 4.4.3).

Marsh (1998) stated that food gardens are not only used to feed the learners at school and the community members but they also have the ability to strengthen community knowledge and skills (see section 2.3.4). Whilst Bushula's J.S.S's School Nutrition Programme uses food gardens for their supply of vegetables, the process of maintaining

the food garden has additionally been seen to create opportunities for the sharing of knowledge and skills. For example, the garden committee consists mostly of parents of learners from the school who are able to share their skills and knowledge gained from the school's food garden with the rest of the community. Additionally, learners at the school were also exposed to School Nutrition Programme activities such as helping with the weeding of the food garden (see Section 4.3). Wals, et al (2009) considered such an opportunity for people to learn from one another through a learning system to be an example of social learning.

The interactions between the School Nutrition Programme committee members and community members is also very useful as it provides an opportunity for people to come together and discuss issues affecting them, to share information and knowledge and hence to learn from each other as a community of practice. This is a good example of what Wenger et al (2002) described as a community of practice: a group of people who share a common concern, a set of problems or the passion they have about a topic, and at the same time deepen their knowledge and skills in this area by interacting on an ongoing basis. In such contexts, learning occurs through social participation in shared practices, and that people's interactions and informal learning processes are important for sharing tacit knowledge (see Section 2.7.2).

FINDING 2: In Bushula's J. S. S.'s School Nutrition Programme, explicit knowledge is more common amongst those in formal leadership or educational roles, whilst local, contextualised and tacit knowledge predominates amongst parent volunteers and food handlers.

Members of the Community of Practice have interacted in different situations when managing or participating in the programme. Figure 4.1 gives a picture of how these interactions enabled the School Nutrition Programme members to access and produce the different types of knowledge in the school's Nutrition Programme and share that knowledge between the members. Lave and Wenger (2010) stated that, in a community of practice, learning occurs between the members through story-sharing, personal experiences or helping each other to understand certain issues, either formally or informally (See section 2.9.3).

Reflecting on the data presented in Chapter 4, different types of knowledge are produced and shared in Bushula's J.S.S School Nutrition Programme, such as explicit knowledge and tacit knowledge. Explicit knowledge (to "know what") is an example of academic knowledge, which Smith (2000) defines as knowledge that is commonly presented using formal language in print or electronic media, and is often based on established work processes using the people-to-documents approach (see Section 2.10.2). In this study, explicit knowledge was mostly produced and shared through curriculum linked activities, workshops and training coordinated by people such as the School Nutrition Programme committee members, school management team and the educators (see section 4.8.1). This type of knowledge is produced and shared in different formal meetings related to the School Nutrition Programme at Bushula's J.S.S. The School Nutrition Programme members, especially those in leadership positions such as the programme coordinator and the school principal, also organised meetings and training workshops for the committee members to sustain the programme (see section 4.14.1). This was evident when I observed the School Nutrition Programme coordinator, who conducted a workshop with the food handlers about 'Germs in the kitchen'. The workshop included discussions on prevention of food-borne diseases and how to keep the kitchen clean (see section 4.8.1). Such meetings were noted to be very useful as they provided a formal (and hence explicit) platform for knowledge production and knowledge sharing within the Community of Practice. It also gave the School Nutrition Programme members a chance to come together to share and discuss issues affecting them and to exchange information. Members of the community of practice were, in essence, sharing and gaining explicit knowledge from each other through these formal interactions.

Sharing of explicit knowledge was also evident in some curriculum-based activities during teacher-learner interactions in the classroom. For example, in one of the Grade 9 Life Orientation periods, one of the teachers tasked the learners with making a poster on the theme 'Healthy Lifestyle' (See figure 4.6) after she had provided them with information about nutrition from the textbook. The learners had to do their own research and share ideas to make the poster more attractive and educative.

Through this case study, I found that informal learning processes were more influential in enabling community-based environmental learning. The community provided a context for social interactions to occur between those involved with the School Nutrition

Programme and other community members. By focussing on their shared practice and common concerns, the School Nutrition Programme gave people a chance to interact and hence to produce and share knowledge. This is confirmed by Wenger et al (2002) that in a Community of Practice, learning occurs through social participation in shared practices and that people's interactions and informal learning processes are important for knowledge sharing (See section 2.10.2).

In the School Nutrition Programme, knowledge was also produced and shared through informal social interactions between the School Nutrition Programme committee members, educators and community members. This type of informal knowledge was mostly tacit. Smith (2000) identified this type of knowledge as action-orientated knowledge or 'know how', which is based on practice and acquired through personal experience. She further described tacit knowledge as knowledge that is learnt by observing, imitating, practising or becoming socialised into a specific way of doing things, such as learning from peers. The members engage in established social practices and interactions such as weddings, funerals and other festivities which become informal platforms for knowledge-sharing. This was evident, for example, when the school organised an awareness campaign about circumcision for the boys. The school also invited members of the community to come and learn and to share the breakfast with them. Some of the parents volunteered to help the catering committee and educators prepared the breakfast. During that whole process some parents actually obtained new cooking skills as well as traditional knowledge as the breakfast included indigenous foods. Through this experience and observation, community members and learners obtained knowledge and adapted practice as some of the parents were helping with the preparations for the breakfast. Brockman & Anthony (1998) contended that tacit knowledge is knowledge that can only be observed or shown to and unlike explicit knowledge it cannot be taught or educated (see section 4.9.1). Many of the School Nutrition Programme members, educators and learners also helped the garden committee in the food garden. Through that activity and by observation they obtained some gardening skills and knowledge of sustainability practices. Many of the community members have now started their own food gardens at home (see Section 4.9.2). This is evidence that tacit knowledge is mostly learnt informally and through observation.



Figure 5. 1 Shows a food handler preparing an indigenous meal for the School breakfast using herbs (Imifino).

FINDING 3: Participation in the School Nutrition Programme provides opportunities to develop skills relevant to sustainable food cultivation, nutrition and basic management.

Skills have been described as the possibility of being able to carry out a given task and as the ability to show the best results with a high certainty of efficiency (Joint ASTD and Department of Labour, USA. 2012). Participating in communities of practice shares and develops not only members' knowledge, but also their skills. Clark (1973) explained community of practice as a group of people who share a common belief that gives the opportunity for interactions within the community (See section 2.9.1). Through these interactions, the members of the School Nutrition Programme acquired new skills and knowledge through observing and exchanging information. This network of knowledge and skills-based interactions is reflected in Figure 4.1, which illustrates how Bushula's School Nutrition Programme works together as a Community of Practice to meet the learners' needs. The School Nutrition Programme committee members share out tasks and help one another wherever possible. They acquired new skills through these interactions and observations. From the data analysis it is evident that the committee members were mutually engaged, for example educators, learners and parents sometimes help in the garden when they have free time, the parent volunteers and the learners also help the food handlers with washing the dishes and the educators also help by making sure that the learners are all served and that they have enough cutlery for the learners in each class. Since all these stakeholders are involved in the running of the School

Nutrition Programme, relevant skills are produced and shared amongst the committee members, such as management skills, financial management skills, cooking and gardening skills, communication skills and leadership skills.

During an interview, one of the interviewees said that being in the programme has helped him learn how to respect people much better as he has to work with a variety of people from different backgrounds. Some committee members also admitted that the programme had improved their respect and communication skills (See section 4.13.1). This type of skill can therefore be referred to as a personal trait skill, which Toby (2009) described as how one carries oneself in terms of initiative, reliability and resourcefulness (see Section 2.10.3).

The School Nutrition Programme is funded through a conditional grant that is transferred to provinces on a quarterly basis and the National and Provincial Department of Education is accountable for the management and utilisation of these funds. However, at the school level, the principal, School Governing Body and the procurement committee as well as the School Nutrition Programme committee are accountable for the management of these funds. As such, basic budgeting skills or financial management skills are essential for programme leaders. These skills were referred to during an interview when a committee member noted that, through the running of the programme, her budgeting and management skills had improved (See section 4.13.1). Additionally, when I interviewed one of the stakeholders about what he had learnt from the implementation of the programme, he emphasised the different types of skills he had gained through his involvement in the programme, most notably budgeting skills, management skills and listening skills (Int.01.02.17). Most other interviewees also acknowledged having gained budgeting skills, such as the skill to save money without spending it on unnecessary things (see section 4.13.1). As discussed in Section 2.10.3, Toby (2009) described these skills as functional skills comprising data, people and thinking skills, and includes planning, organising and managing in an organisation.

FINDING 4: Social-ecological knowledge related to food cultivation is contextual and experience-based in the School Nutrition Programme's Community of Practice.

This section discusses the nature and extent of indigenous social-ecological knowledge within the community of practice of Bushula's Junior Secondary School Nutrition Programme, and argues that such knowledge is strongly experience-based.

Keen et al (2005) described social-ecological knowledge to be a combination of action and reflection processes that take place amongst individuals and groups (see section 2.8.1). In the context of the Eastern Cape, Dold and Cocks (2012) reported how earlier generations of amaXhosa and ,even some people today use forests and forest products for rituals and traditions as well as for traditional foods such as "imifino". In Xhosa culture, diviners use forests during their initiation seasons. During their rituals they use specific types of wood to build fires for cooking. African people in general rely on traditional doctors who use wild herbs and forest plants for their treatments. Similarly, Fox and Young (1982) also emphasised that the foods that are used by community members in the Eastern Cape rural areas are derived from wild edible plants.

The case study data suggests that, although environmental sustainability is not a very explicit or dominant concern in the School Nutrition Programme, the community of practice has created some opportunities for recognising and sharing social-ecological knowledge. In almost all cases, social-ecological knowledge was based on cultural practices and local, contextual experiences. For example, one of the food handlers told me during an interview that, amongst the things she had learnt from the SNP, she had learnt about sustainability practices (see Section 4.9.3). She said that, as a school and community, they needed to ensure that they do not overuse their natural resources and they need to ensure that there will be resources available for the future. The interviewee also mentioned that it is not advisable to use fertilizers for the soil but rather use vegetable and fruit peels and any other left-overs besides plastics (Int.08.02.06-09).

Sustainability of the human-managed environment demands co-operation between different groups operating at different levels, and this involves social learning (Dyball, Valerie & Keen, 1973, cited in Wals, 2007) (see section 2.12.3). Wals et al (2009) pointed out that this kind of social learning is a process that stimulates people to reflect

upon implicit assumptions and mental frames to enable new perspectives and to develop actions. The examples of the food handler and the parent mentioned above are evidence of this type of social learning because the knowledge each one gained was obtained through social interactions in the form of observing other people's actions or drawing on their experiences.

Hilary & Adrienne (1999) argued that indigenous knowledge commonly reflects a balance between people's needs and nature and thus has an important role to play in the sustainable management and conservation of natural resources. This is evident when schools and community members use wood to make fire for cooking and keeping their houses warm as they believe that using firewood is environmental-friendly.

Drawing on the study's data, it was evident that the garden committee members produce and share indigenous knowledge while participating in the School Nutrition Programme. One afternoon, when the garden committee was working in the garden with the help of some educators, one of the parents suggested that they do not have to use insecticides to kill insects as this is not good for the soil, instead they must try to use other plants to deter these insects such as planting mint next to the affected ones. She also suggested that they must use peels and left-over vegetables to make compost, which in turn can be used as a fertilizer.

During one of my observations, I was observing the Natural Science educator teaching the Grade 9 learners about the value of plants in our environment, which includes medicinal values and economic values (Obs.08.01.03) (see section 4.14.1). There was evidence of sharing of indigenous knowledge because the educator told the learners more about herbs that were used years ago by our parents as they did not have easy access to doctors. She used the aloe as an example, as this plant is still used today, both in the traditional and modern sectors. Some of these plants are also taken as food (imifuno) locally.



Figure 5. 2: natural Science educator and learners in the school indigenous garden.

Another example of indigenous knowledge was evident during a session in the garden with the community members and some educators. Whilst in the garden, they found that the garden has a problem of birds feeding on the plants, so one of the learners built a scare-crow to chase away all the birds. This method was practised long ago by our great grandparents in their mealie fields and food gardens, so it is basically a traditional practice because when the learner was asked how he knew about this, he replied that he saw his grandfather using it in his garden to chase away the birds that would destroy their crops (See section 4.12.3).

5.3 CONCLUDING SUMMARY

This chapter has drawn on perspectives on social learning in communities of practice to discuss the data presented in Chapter 4, and to respond to the research questions and goals as introduced in Chapter 1. In the following short chapter, I will synthesise these research findings to present my final conclusion and make some recommendations for further research in this area. I will conclude with some critical reflections on the overall study.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

Chapter 5 provided an in-depth view of learning interactions, practices, knowledge and skills produced and shared within the School Nutrition Programme's Community of Practice. In this chapter, I synthesise the whole study in terms of the research question and research goals, and reflect on the methodology used. This chapter also makes recommendations relevant to the School Nutrition Programme and recommendations for further research based on the experiences and insights gained from this small case study.

6.2 CONCLUDING INSIGHTS

Documents analysed for this study point to the significance of the School Nutrition Programme for learners in South African schools as well as for the communities in which they live (see DOC1, DOC2, DOC3, DOC12 and DOC13). In the context of Bushula's J.S.S, most learners come from child-headed households or stay with relatives in conditions of poverty; as such, they benefit greatly from the School Nutrition Programme. The increasing number of orphans in the school has led to an increase in the number of learners who receive breakfast and lunch from the School Nutrition Programme on a daily basis. To sustain this programme, members of the School Nutrition Programme and other school educators decided to start a food garden at the school. With these documents and my school's context as a starting point, this study has asked: "To what extent can a School Nutrition Programme serve as a catalyst for community-based environmental learning and enhanced food security?"

This study has shown that the School Nutrition Programme provides a platform for social learning as the community members involved in this programme acquire knowledge about sustainable living for food security. Being involved in this programme has influenced and equipped some of the educators, learners and community members with knowledge and experience needed to start their own food gardens. This means that there should be a continuous interaction between the people in the leadership and educational roles of the School Nutrition Programme and the rest of the committee members as this will enhance the sharing of the different types of knowledge that they possess. It has been

noted that explicit knowledge mostly resides with the people in leadership roles and tacit knowledge mostly resides with the parent volunteers and food handlers in the School Nutrition Programme. The School Nutrition Programme has to organise meetings, training sessions and workshops, where relevant people such as the School Nutrition Programme members and community attend. These meetings and workshops therefore help the members to produce and share knowledge and skills relevant for the production of food gardens. Producing and sharing knowledge in the context of food gardens at Bushula's J.S.S will help the Bushula's Community of Practice produce and share social-ecological knowledge.

6.3 RECOMMENDATIONS

The recommendations discussed in this section are drawn from the findings presented in Chapter 5, which are supported by the more detailed presentation of the data in Chapter 4.

6.3.1 The School Nutrition Programme needs to create more programmes and initiatives that promote social learning to share knowledge about strategies to alleviate poverty in the community. Chapter 5 of the study showed that learning occurs between the School Nutrition Programme and the community. Only a few community members are involved in the School Nutrition programme, such as the SGB members, learner support agent, food handlers and the two parents that offer voluntary services. This can slow the flow of knowledge sharing between the School Nutrition Programme and the community and, ultimately, affect the extent to which the School Nutrition Programme can serve as a catalyst for community-based environmental learning to enhance food security.

The committee needs to organise campaigns and fun, knowledgeable activities for the general community so as to involve and inform everyone in the sustainable production of vegetables. These activities should be planned in a way that involves both the community and the school, with knowledge-sharing and learning being the main focus. This is in line with the Nelson Mandela Foundation's (2005) encouragement of community members taking responsibility for school feeding programmes such as the School Nutrition Programme.

6.3.2 The School Nutrition Programme members should actively promote local food production through reaffirming indigenous knowledge and traditional practices related to food cultivation. The School Nutrition Programme's Generic Training Manual (South Africa, 2008) encouraged the use of indigenous foods in preparing meals for the learners as these foods are easily available, fresh, nutritious and cheap. Furthermore, this study's data has shown that members of the School Nutrition Programme do draw on local knowledge and traditional practices, but this approach to learning seems to be taken for granted in the community of practice.

Food handlers need to share their indigenous knowledge with other School Nutrition Programme committee members more formally, for example, they can share and use recipes, remedies and other indigenous practices related to sustainable food cultivation that they learnt from their parents. Community gatherings are a good platform for this type of knowledge-sharing because women in the community observe and learn from elderly women as they cook. A strengthening of indigenous knowledge and traditional practices can benefit the School Nutrition Programme in the following ways:

- *economically* (home-grown food is generally cheaper and does not require transport to town);
- *nutritionally* (it is fresh and, in most cases, organic);
- *environmentally* (local, traditional food plants are well-adapted to growing in the local climate and ecosystem, thereby reducing the need for harmful pesticides or inorganic fertiliser. Growing food locally also eliminates the need for refrigeration and transportation as with commercially sold vegetables, and this reduces the carbon footprint of the food production process);
- *culturally* (the value of indigenous practices are strengthened);
- *socially* (people living in a context of poverty are able to cultivate their own food and perhaps even sell it when there is a surplus).

6.3.3 The School Nutrition Programme should explore ways of sharing knowledge and skills related to food cultivation more formally. The case of Bushula's J.S.S's School Nutrition Programme has shown that knowledge and skills produced and shared

in this community of practice are mostly tacit knowledge that is shared through observing others' practices. It would therefore be advantageous for the School Nutrition Programme committee members to develop a more formal training programme that can improve the knowledge and skills that they already have, such as gardening skills and cooking skills.

6.3.4 Teacher professional development workshops, or other explicit strategies are needed to help teachers at Bushula's J.S.S strengthen social-ecological learning in the curriculum, especially regarding the links between health, nutrition and environmental sustainability. There is evidence that educators include "Health and Nutrition" in their lessons, for example, Chapter 4 described how a teacher gave her

Grade 9 learners a task to create a poster that is based on health and nutrition under the theme "healthy lifestyle". They used this poster for a once-off event to inform the rest of the school about living a healthy lifestyle. It was also evident that involvement in the running of the School Nutrition Programme gives teachers at Bushula's J.S.S opportunities to learn more about food security and other environmental issues, as well as relevant solutions. However, these environmental learning opportunities and links to the curriculum are currently limited and need to be nurtured. There is a need for continuous teacher professional development opportunities to strengthen environment-oriented learning in the curriculum. This may be achieved by organising teacher workshops, and starting environmental projects that involve the learners, teachers and parents. Such projects can include enhancing the school garden, starting an Eco-Club in the school or running practical competitions that are environmentally orientated.

Placing the learner at the centre of the home, school and community environments is central to any efforts undertaken by Bushula's J.S.S to enhance environmental education through the School Nutrition Programme. As shown in Figure 6.1, when home, school and community environments are equally involved in education, learning can be a three-way flow, as suggested by Taylor and Mulhall (2001). Teachers at Bushula's J.S.S will benefit from formal training to understand and develop these connections through their classroom practice.

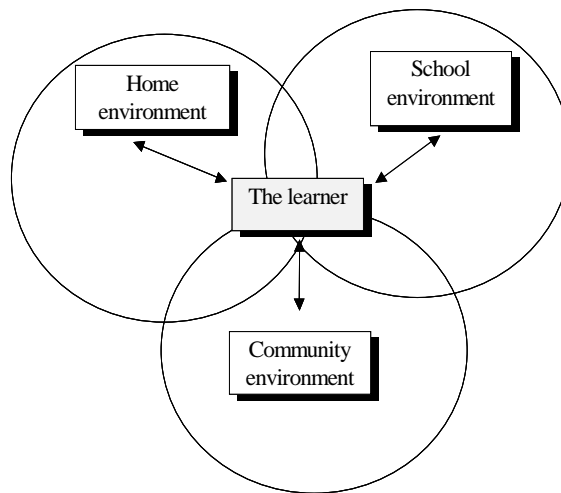


Figure 6. 1 Linking the Learning Environments (Taylor & Mulhall, 2001,pp. 135-148)

Some national and provincial programmes that might support such developments are the Eco-Schools Programme implemented by the Wildlife and Environment Society of South Africa (WESSA), and the Fundisa for Change programme, a national teacher professional development programme aimed at strengthening environmental education that is endorsed by the Department of Basic Education.

6.4 OPENINGS FOR FURTHER RESEARCH

It would be interesting and useful if further research could be conducted on the same topic as this study, but with a wider range of research participants. For example, beyond involving the School principal, teachers, food handlers, the garden committee, and learner support agent, the researcher could also involve learners, healthcare professionals (such as local nurses, doctors and dieticians) and the community at a much broader level. These people deal with different people daily in their work environments and this can make it easier for them to interact with community members.

This research was based on a case study of one school (Bushula's J.S.S), and so its findings are not generalizable. More valuable insights could be gained by conducting similar studies in rural schools in the Eastern Cape to develop a more comprehensive picture of the potential of the School Nutrition Programme to extend to community-based learning for enhanced food security. Such research could involve both primary schools and secondary schools as they all implement the School Nutrition Programme.

This small case study has opened up several areas of research interest, which I have not been able to explore. These research areas can include:

- (i) Investigating the form and function of indigenous knowledge related to sustainable edible plant cultivation in the context of school food gardens.
- (ii) Understanding the potential of various professional development models for supporting teachers to bring out environment-oriented learning through their teaching practice, as required through the Curriculum Assessment Policy Statements (CAPS).
- (iii) Understanding the extent to which the School Nutrition Programme can be used as a vehicle for health education in public schools and communities in South Africa.

Research can also be undertaken to focus mainly on the use of indigenous knowledge in schools and the community to help alleviate poverty. For research of this kind, I recommend that the researcher involves elders from the community, traditional healers and all other community members in general so that they can help with discovering knowledge.

6.5 REFLECTIONS ON THE STUDY

Through this case study research, I have learnt that one needs to be very patient and humble when working with a research-based project that involves different stakeholders. This study has also highlighted the importance of respecting one another when working as a team. From the literature I reviewed for this study and through observations and document analysis, I have learnt that, as educators, we need to bridge the gap between our learners' theoretical understandings and practical understandings of environmental learning. This requires us to strengthen the practical and contextually relevant dimensions of our educational work.

As a researcher, I faced many challenges related to generating and analysing the case study data. For example, it was difficult to find hard copies of important documents relevant to the School Nutrition Programme and many that I found were not in good condition or were undated. Regarding the semi-structured interviews, I struggled to generate focused, relevant data as many interviewees gave very generalised or emotional responses to my questions.

The findings of this study indicate that Bushula's J.S.S's Nutrition Programme has played a role in enhancing social learning for food security but, because poverty has caused such harm to the lives of people in rural schools and communities, there is a lot to be done and I hope that the School Nutrition Programme would be able sustain itself into the future, even without the help of the National Government. The School Nutrition Programme has its own food garden so, hopefully, that can influence the community members to start a food garden project as a poverty alleviation strategy in the community. Such a community project will not only improve the community's lifestyle but will also help improve the unemployment rate in the community. The food garden at school can further influence the community to implement projects such as "One home- One garden" strategy, where each household in the community will have its own food garden. The study that knowledge about social-ecological concerns is mostly produced and shared through training workshops, meetings. As such, the School Nutrition Programme has to implement more of these gatherings that will involve both the committee members and the community.

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8. APPENDICES

A 1 INTERVIEW SCHEDULE FOR SEMI-STRUCTURED INTERVIEWS

1. What changes have been brought to school and community by the implementation of the School Nutrition Programme?

2. In future, as community members' what are your plans to improve School Nutrition Programme at school?

3. Which knowledge regarding School Nutrition Programme do you think can be relevant to improve the programme and how that knowledge can be used? How the community at large can benefit from it to improve their quality of life at school and in the community?

4. What can we do to share the knowledge available in the implementation of School Nutrition Programme?

5. Which knowledge have you already gained in the implementation of the programme?

A 2 OBSERVATION SCHEDULE

DATE	PARTICIPANTS	ACTION OBSERVED	REASON FOR OBSERVATION	TIME FRAME
24-04-2012	Programme coordinator and meal servers	Workshops	To observe the sharing of knowledge	13H30-14H45
04-05-2012	Community members	Meeting	To observe social interaction between the community members	14H30-15H50
16-05-2012	School Nutrition Programme committee and garden committee	Meeting	To observe sharing of knowledge and problem discussions	12H15-13H00
31-05-2012	Garden committee, parents, care giver and educators	Observing the stakeholders working in the garden	How they share their activities and mutualism	12H00-13H30
31-05-2012	Food handlers and learners	Observing food handlers serving learners	To uncover the new knowledge advices about their real life situations	10H30-11H10
04-06-2012	Food handlers	Preparation of meals	Appropriateness of doing things and to observe team effort	13H09-13H30
20-05-2012	Community members	Community meeting	Sharing of ideas to improve the community	11H00-14H05

A 3 CONSENT LETTER FOR THE SCHOOL PRINCIPAL

PO BOX 375

LUSIKISIKI

4820

11 March 2012

THE MANAGER

BUSHULA'S JUNIOR SECONDARY SCHOOL

P.O. BOX 375

LUSIKISIKI

Dear Sir

RE-REQUEST FOR AUTHORITY TO CONDUCT A RESEARCH WITHIN THE SCHOOL

Kindly allow me to conduct a research using Bushula's J. S.S. as a research site. I am registered for Masters of Education with Rhodes University. As part of my studies, I have to complete a practical research. The whole research process will be of the benefit to the school and the community.

The execution of the research may under no circumstances disrupt the normal teaching programme of learners unless that was in the school programme of that day. Participation is voluntary to all the participants and it will be my responsibility to explain everything. I plan to involve SMT, School nutrition committee, which includes school nutrition programme co-ordinator some educators, SGB members, food handlers and the school care giver.

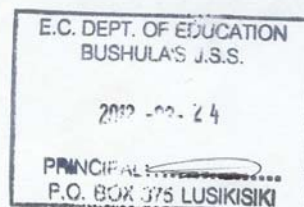
The reason for choosing them is that my area of interest is on the extent to which school nutrition can be used as a catalyst for community based environmental learning.

Thanking you in advance for your anticipated co- operation.

Yours truly



V. Tshabeni



A 4 CONSENT LETTER FOR THE PARENTS-A1 (XHOSA)

BUSHULA JSS

P.O BOX 375

LUSIKISIKI

4820

25 April 2012

Mzali!

Ndingu litshala kwisikolo sakwa Bushula, apho ndifunda ngasenc nedyunivesithi yase Rhini, i Rhodes. Izifundo zam ziquka ufundo ngezendalo.

Kwizifundo zam ndiyi ndanondla ngezifundo ezithi zenzeke kwinkqubo yokondliwa kwabantwana ezikolweni. Ngako oko ndicela uthathe inxaxheba xa ndiqokelela ulwazi ngodliwano-ndlebe ukuze ndiqukumbele uphando lwam..

Inkcukacha ngendlela esizakusebenza ngayo eziqoku amalungelo akho onke onawo koluphando adweliswe kwiphepha elilodwa elizakuthunyelwa kuwe nalo.

Ozithobileyo|

V Tshabeni

Igama lomzali N. Sihlolo

Intsayino gama N. Sihlolo

Umhla 28-04-12

A 5 CONSENT LETTER FOR THE PARENTS-A2 (ENGLISH)

BUSHULA'S JSS

P.O BOX 375

LUSIKISIKI

4820

25 April 2012

Dear Parent

I am an educator at Bushula's Junior Secondary School. I have enrolled at Rhodes University for Masters in Environmental education.

I request you to take part in my research study about social learning as an interviewee where you will have to respond to the questions asked. Your participation in this interview will be fully voluntary.

Details for the procedures to be followed in this research which includes all your rights are listed in the consent form.

Thanking you in advance.

Yours faithfully

V Tshabeni

Parents initials: _____

Parent's signature: _____

Date: _____

CONSENT FORM FOR SCHOOL NUTRITION COORDINATOR

As part of my studies for the Masters Degree in Environmental Education at Rhodes University, I have to complete a research study for which I need your assistance.

The title and brief description of the goal and value of the study

To what extent can the School Nutrition Programme be used as a catalyst can be used for community based environmental learning and to enhance food security?
The study aims at encouraging social learning between the school and community to alleviate poverty through the use of knowledge constructed when the programme is implemented.

All I am asking of you

Is to allow me to use the school nutrition programme to initiate learning for both the school and the community.
To have access to documents like Training manual, Nutritional policy, School nutrition programme- year plans, Records reflecting allocation of work, Annual reports, Budget.
To involve the food handlers.

Researcher's signature: Shabem Date: 26-04-2012

SNP Coordinators signature: M. Goolbsie Date: 28-04-2012

SNP Coordinators signature: *[Signature]* Date: 28-04-2012

A 7 CONSENT FORM FOR THE EDUCATORS

CONSENT FORM FOR THE EDUCATORS

As part of my studies for the Masters Degree in Environmental Education at Rhodes University I have to complete a research case study for which I need your assistance.

The title and brief description of the goal and value of the study

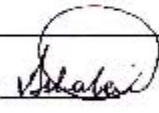
To what extent can the School Nutrition Programme be used as a catalyst for community based environmental learning and to enhance food security?

The study aims at encouraging social learning between the school and community to alleviate poverty through the use of knowledge constructed when the programme is implemented.


All I am asking of you

Is to participate in the study as I will be having interviews that will require your opinion.

Give your input towards the development of the school nutrition programme and identify the areas of development.

Researcher's signature: 

Date: 28-04-2012

Educator's signature: 

Date: 28-04-2012

A 8 ANALYTICAL MEMOS

ANALYTICAL MEMO 1

MUTUAL ENGAGEMENT

EVIDENCE FROM DATA	DATA SOURCE
Shared ways of doing things	
We work hand in hand for the success of the programme.	Int. 02/p. 01/line. 04
As educators we have taken the priority to teach the learners all that we can	Int. 02/p. 03/line. 06
South Africa together with the South African Development Community are working together to achieve regional food security.	DOC. 12/p. 12/line. 08 DOC. 09/p. 01/line. 11
The food handlers should be accompanied by some of the stakeholders when they go for shopping.	DOC. 08/p. 01/ line. 02
When people work together as a team a lot is achieved.	DOC. 04/p. 02/line. 04
Parents agreed to help the school with washing up the dishes and dishing for the learners.	OBS. 04/p. 01/line. 05 Int. 01/p. 01/line. 03
They are working together in the garden- (garden committee, 2 parents, and school care giver)	
Sustained mutual relationship	DOC. 11/p. 01/line. 16
We all help in the garden	DOC. 10/p. 01/line. 19
...working so hard to improve the state of the community.	DOC. 08/p. 01/line. 02
Shared a word of appreciation to the	

school for working so well with the community.	DOC. 04/p. 02/line. 04
When people work together as a team a lot is achieved.	OBS. 04/p. 02/line. 05
Parents agreed to help the school with dishing up and washing dishes.	OBS. 04/p. 01/line. 05
The garden members are so grateful to the others for volunteering to help them in the garden.	Int. 01/p. 01/line. 10
As they are working together, they show me that they have the same aims.	
Generation of new knowledge	Int. 01/p. 02/line. 12
“Without education, you can find it very hard to survive in this life”.	Int. 01/p. 01/line. 20
Instil budget skills	Int. 01/p. 03/line. 06
Learners are taught about having a healthy balanced diet	Int. 01/p. 03/line. 10
Parents called in for workshops or meetings	Int. 01/p. 03/line. 19
People learn by example so we need to be good examples to the community.	Int. 02/p. 02/line. 10
“I have acquired management and listening skills”.	Int. 02/p. 03/line. 18
We were taught the importance of budgeting	DOC. 10/p. 01/line. 02
Learnt how to respect my learners	DOC. 06/p. 01/line. 04
...Importance of nutrition as it results in a healthy mind and body.	OBS. 01/p. 01/line. 03
“A health mind equals to a healthy body”.	OBS. 01/p. 01/line. 24
Workshop I about the does and don'ts in the kitchen.	Int. 01/p. 01/line. 03

One lady suggests that we need to heat or boil water before drinking.	Int. 02/p. 03/line. 06 Int. 04/p. 03/line. 01
Rapid flow of information	
Organise fun themed days	
Teach learners all that know based on nutrition- because they will go back home and tell the others.	Int. 07/p. 03/line. 05 Int. 09/p. 02/line. 10
Passing on knowledge is not something very difficult.	
Get involved in social gatherings that take place within the community, that way we will be able to share what we know.	Int. 10/p. 03/line. 12 Int. 01/p. 01/line. 04
Learn from each other and the programme itself.	
...we can be sure that if we maybe teach ten parents they will then pass on the information to their peers when they meet in social gatherings”.	
Absence of introductory preambles	
Very quick setup of a problem to be discussed	Int. 01/p. 02/line. 02
The School Nutrition Programme has brought a lot of changes in school both academically and socially.	Int. 01/p. 02/line. 07 Int. 01/p. 02/line. 11
Start our own vegetable garden.	Int. 02/p. 02/line. 01
Building a dining hall	DOC. 14/p. 01/line. 13
Hired more food handlers	
Improve the prescribed menu	DOC. 11/p. 01/line. 08
Programmes focus primarily on providing food to the needy	DOC. 08/p. 01/line. 05 DOC. 04/p. 01/line. 10

<p>Buy new utensils.</p> <p>Increasing food handlers wages</p> <p>Food handlers should peel and cut the vegetables the day before so as to save time.</p> <p>Food handler soaks her beans before cooking them just so they cook faster.</p> <p>Approach the school principal to extend our garden</p>	<p>OBS. 06/p. 01/line. 11</p> <p>OBS. 04/p. 01/line. 06</p>
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ANALYTICAL MEMO 2

JOINT ENTERPRISE

<p>Substantial overlap in participants description of who they are</p> <p>Knowing what others know, what they can do and how they contribute to an enterprise</p> <p>Mutually defining identities</p> <p>A hymn and prayer</p> <p>Singing of the National Anthem</p> <p>Women are sitted separately from the men.</p> <p>Food handler tells a learner to sit down when eating because it shows disrespect in their culture.</p> <p>One of the learners asks why they do not bless the food before eating at school.</p>	<p>DOC. 06/p. 01/line. 01</p> <p>DOC. 04/p. 01/line. 01</p> <p>OBS. 07/p. 01/line. 16</p>
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Ability to assess appropriateness of actions	OBS. 05/p. 01/line. 21 OBS. 05/p. 01/line. 13
Check and receive grocery and place orders.	
Adding fruits to the menu so as to balance the diet.	
There are 22 approved meal plans and many providers have chosen cold menu plans that do not need cooking.	
The institutional reform for food security aim to enable coordination among Departments at national and provincial level.	Int. 03/p. 01/line. 02 Int. 03/p. 02/line. 02 DOC. 13/p. 02/line. 06
The number of learners had increased so more food handlers need to be hired.	
Keeping all the receipts safe for accounting purposes.	DOC. 12/p. 33/line. 16
A parent asked the food handlers to not cook a lot of food as the left overs are usually thrown away	DOC. 10/p. 01/line. 13
Keep in mind the nutrition of the learners but keep the budget in mind.	DOC. 09/p. 01/line. 10
Feeding should be done before 10h00	DOC. 06/p. 02/line. 01 DOC. 06/p. 01/line. 14 DOC. 03/p. 03/line. 01

ANALYTICAL MEMO 3

SHARED REPERTIORE

<p>Specific tools, representations and other artefacts</p> <p>Local lore, shared stories, inside jokes and knowing laughter</p> <p>“We have to approach the ‘Boss’</p> <p>Jargon and other shortcuts to communication</p> <p>Certain styles recognised as displaying membership</p> <p>A shared discourse reflecting a certain perspective in the world</p>	<p>(Obs. 04/p. 01/ line. 17)</p>
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ANALYTICAL MEMO 4

EXPLICIT KNOWLEDGE

<p>Knowledge produced and shared about nutrition</p> <p>Learners need to be taught about a healthy balanced diet</p> <p>Hanging bright and bold posters and banners in the community and at school</p> <p>Giving out pamphlets to the community</p> <p>Learning the importance of a balanced and nutritious diet I started my own garden.</p>	<p>(Int. 01/p. 01/line. 20)</p> <p>(Int. 01/p. 03/line. 09)</p> <p>(Int. 01/p. 03/line. 07)</p>
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<p>Teach learners all we know based on nutrition</p> <p>Everyone was taught almost everything about nutrition thoroughly</p> <p>Presentations and projects concerning a healthy lifestyle</p> <p>The committee needs to organise cooking workshops for the food handlers</p>	<p>(Int. 01/p. 03/line. 17)</p> <p>(Int. 02/p. 03/line. 07)</p> <p>(Int. 03/p. 01/line. 08)</p> <p>(Int. 03/p. 03/line. 02)</p> <p>(Int. 07/p. 02/line. 16)</p>
<p>Knowledge about food gardening</p> <p>I have learnt how to cook vegetables in a proper manner</p> <p>I learnt that there are other good ways of doing vegetable gardens like drawing from some indigenous practices</p> <p>This will also help us practice crop rotation for the benefit of the soil and high production</p>	<p>(Int. 07/p. 03/line. 13)</p> <p>(Int. 07/p. 03/line. 14)</p> <p>(Obs.04/p. 01/line. 11)</p>
<p>Knowledge about social ecological relationships</p>	
<p>Other forms of explicit knowledge</p> <p>Parents are called in for workshops and meetings based on teaching them about the useful knowledge found in the</p>	<p>(Int. 01/p. 03/line. 06)</p>

programme	(Int. 05/p. 03/line. 11)
This programme has really taught me a lot	(Int. 07/p. 03/line. 03)
All stakeholders involved in the programme need to be trained	(Int. 07/p. 03/line. 21)
The different things that I have learnt have really helped me	(Obs. 02/p. 01/line. 23)
Community has their own development centre	(Int.03/p. 02/line. 03)
The School Manager or coordinator could approach a local newspaper to allow them to write a column	

ANALYTICAL MEMO 5

TACIT KNOWLEDGE

Knowledge produced and shared about nutrition	
Learners show their parents the importance of eating healthily	
Pass on the knowledge about nutrition to their families	(Int. 01/p. 01/line. 21)
This programme has helped me enhance my cooking skills	(Int. 03/p. 02/line. 11)
Meet up whenever we are free to share our own knowledge about nutrition	(Int. 03/p. 03/line. 21)
It is important for the food handlers to know the number of learners they are feeding	(Int. 04/p. 03/line. 10)
“here to remind each other on how to keep the kitchen clean”	(Int. 07/p. 02/line. 12)
	(Obs. 01/p. 01/line. 06)
Knowledge about food gardening	

Garden committee share skills and knowledge about gardens to the learners and parents	(Int. 01/p. 01/line. 14)
Go back home and start their own vegetable gardens	(Int. 01/p. 01/line. 16)
People learn by example	(Int. 01/p. 03/line. 11)
Decided to start my own family garden	(Int. 01/p. 03/line. 12)
The gardening skills the enquired by the community can be taken back into the community	(Int. 02/p. 02/line. 13)
	(Int. 02/p. 03/line. 14)
The one thing I took from the programme was planting my own vegetable garden	
	(Int. 04/p. 01/line. 12)
Many families have taken the idea of starting their own vegetable gardens	(Int. 08/p. 02/line. 07)
You do not need to buy fertilisers to fertilise the soil	(Int. 08/p. 02/line. 16)
I obtained garden skills through helping the garden committee	
Knowledge about social ecological relationships	
Other forms of tacit knowledge	
I have acquired management skills and listening skills.	(Int. 01/p. 03/line. 13)
Learning how to respect everyone around me	(Int. 02/p. 03/line. 17)
Everyone in the community also just has	(Int. 03/p. 03/line. 11)

to spread the word around in their community and families	
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ANALYTICAL MEMO 6

PROCEDURAL KNOWLEDGE

<p>Knowledge produced and shared about nutrition</p> <p>Learning how to cook properly without draining the nutrients</p> <p>They need to learn how to cook their food and vegetables</p> <p>It will make changes on how they eat as a family</p>	<p>(Int.02/p. 02/line. 17)</p> <p>(Int. 04/p. 02/line. 18)</p> <p>(Int. 02/p. 03/line. 11)</p>
Knowledge about food gardening	
Knowledge about social ecological relationships	
<p>Other forms of procedural knowledge</p> <p>Knowing how to spend your money</p> <p>Follow a certain procedure or order</p>	<p>(Int. 03/p. 02/line. 16)</p> <p>(Obs. 05/p. 01/line. 06)</p>

ANALYTICAL MEMO 7

DECLARATIVE KNOWLEDGE

Knowledge produced and shared about nutrition	
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Organising fun themed days concerning nutrition You are what you eat	(Int. 01/p. 03/line. 03) (Int. 03/p. 03/line. 16)
Knowledge about food gardening	
Knowledge about social ecological relationships	
Other forms of declarative knowledge Going back home and telling everyone what they learnt Knowing what to spend it for Money management skills are very important The implementation of this programme has really broadened my knowledge You have to know what to say She briefs them about “what germs are”	(Int. 02/p. 03/line. 08) (Int. 03/p. 02/line. 14) (Int. 03/p. 002/line. 14) (Int.03/p. 03/line. 14) (Int. 04/p. 03/line. 02) (Obs. 01/p. 01/line. 09)

ANALYTICAL MEMO 8

CAUSAL KNOWLEDGE

Knowledge produced and shared about nutrition So they can also feel eager to learn more and go back home and change the way they eat This will not only be good for their physical well being and health but also their mentality	 (Int. 02/p. 03/line. 10) (Int. 04/p. 02/line. 19)
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<p>So that they will be able to measure the meals correctly to avoid unnecessary shortages</p> <p>This will benefit them as they will change their way of eating at home</p> <p>How germs develop in the kitchen and how to prevent food borne diseases</p>	<p>(Int. 07/p. 02/line. 13)</p> <p>(Int. 07/p.02/line. 16)</p> <p>(Obs. 01/p. 01/line. 09)</p>
Knowledge about food gardening	
Knowledge about social ecological relationships	
<p>Other forms of causative knowledge</p> <p>So that you do not overspend on unnecessary things</p> <p>Because pretty much every household in the community has a radio</p> <p>So that we can work well together</p>	<p>(Int. 02/p. 02/line. 10)</p> <p>(Int. 02/p. 03/line. 02)</p> <p>(Int. 02/p. 03/line. 17)</p>

ANALYTICAL MEMO 9

CONTEXTUAL KNOWLEDGE

<p>Knowledge produced and shared about nutrition</p> <p>Learning the importance of nutrition/healthy balanced diet.</p> <p>..The implementation of the programme has taught me a lot about taking care of my health.</p>	<p>(Int. 01/p. 03/line. 17)</p> <p>(Int. 03/p. 03/line. 14)</p>
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...“is about healthy food handling in the kitchen”.	(Obs. 01/p. 01/line. 02)
<p>Knowledge about food gardening</p> <p>...was planting my own vegetable garden.</p> <p>Learnt that there are other ways of doing my own vegetable garden.</p>	<p>(Int. 02/p. 03/line. 14)</p> <p>(Int. 07/p. 03/line. 17)</p>
<p>Knowledge about social ecological relationships</p> <p>...to put in an empty bottle and lay it in the garden, when the ants are caught in-throw the bottle far away.</p> <p>This workshop is about healthy food handling in the kitchen.</p> <p>...meeting is about the community development.</p>	<p>(Int. 09/p. 03/line. 13)</p> <p>(Obs. 01. p. 01/line. 02)</p> <p>(Obs. 07/p. 01/line. 04)</p>
<p>Other forms of contextual knowledge</p> <p>...“I learnt that the importance of respect is compulsory.</p> <p>Learnt that as a person you need to be confident</p>	<p>(Int. 01/p. 03/line. 21)</p> <p>(Int. 03/p. 03/line. 19)</p>

ANALYTICAL MEMO 10

What did the community members learn?

Evidence from the data	Data source
The importance of nutrition/healthy balanced diet	
Learners taught about a healthy balanced diet.	(Int.. 01/p. 02/line. 20) (Int. 01/p. 03/line. 17)
Learning the importance of a healthy balanced diet.	(Int. 02/p. 03/line. 11)
Go back home and make changes on how they eat as a family.	(Int. 07/p. 03/line. 14)
...“Learnt that our health needs to be cared for”	(Int. 03/p. 02/line. 16)
Learnt the importance of budgeting skills	(Int. 03/p. 02/line. 17)
Need to learn to spend the given budget accurately.	(Int. 02/p. 03/line. 07)
“Knowing how to spend your money and what to spend it for”	(Int. 03/p. 02/line. 08)
Teaching about nutrition	(Int. 03/p. 03/line. 10)
Teach our learners all that we need to know based on nutrition.	(Int. 05/p. 03/line. 15)
...“everyone in the community is thoroughly taught mostly about nutrition”.	
Hang posters and banners based on a healthy lifestyle.	(Int. 03/p. 03/line. 20) (Int. 04/p. 02/line. 18)
Taught me a lot about taking care of my health	(Int. 07/p. 02/line. 16) (Int. 08/p. 03/line. 02)
Different skills learnt	(Int. 01/p. 01/line. 15)
“Helped me enhance my cooking skills...”	(Int. 02/p. 03/line. 14)

Need to learn how to cook their food and vegetables.	(Int. 08/p. 02/line. 16)
Need to organise cooking workshops.	
“I have really improved my cooking skills”.	(Int. 04/p. 02/line. 10)
Share their skills and knowledge about gardens.	(Int. 04/p. 02/line. 13)
... “One thing I took from the programme was planting my own vegetable garden”.	
I have also obtained a lot of garden skills through helping the garden committee.	(Int. 10/p. 02/line. 19)
Communication skills are very important when a lot of people are working together.	(Obs. 05/p. 01/line. 12)
Communication skills go along with respect and listening skills.	(Int. 02/p. 03/line. 17)
Respect	
When working as a team you have to respect one another.	(Int. 05/p. 01/line. 10)
If you eat whilst standing-it is rude in the African culture.	(Int. 05/p. 01/line. 12) (Int. 05/p. 02/line. 15)
“Learning respect for everyone around me...”	(Int. 06/p. 01/line. 05)
Acquired a variety of skills to improve homes and the community	(Int. 08/p. 02/line. 05)
...idea of a vegetable garden has made a difference for many families in the community.	
Unemployment rate has improved.	
...will help improve the health status in the community.	
The programme really made a huge impact both at school and the community.	

Learnt that sustainability is very important.	
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ANALYTICAL MEMO II

How did they learn it?

Evidence from the data	Data source
Called in for workshops or meetings.	Int. 01/p. 03/line. 06
Committee organised cooking workshops for food handlers.	Int. 07/p. 02/line. 15
All stakeholders received training in order to develop their existing knowledge.	Int. 07/p. 03/line. 01
Cooks were trained to improve their cooking skills	Int. 09/p. 03/line. 18
Learners taught about a healthy balanced diet...	Int. 01/p. 02/line. 20
Garden committee share their gardening skills	Int. 01/p. 02/line. 14
Educators teach children the little they can	Int. 06/p. 03/line. 01
Hung informative posters around the school and community	Int. 06/p. 03/line. 06
Meetings and workshops	Int.06/p. 01/line. 03
Start a school magazine	
Coordinator presenting about the “dos and don’ts” in the kitchen	OBS. 01/p. 01/line. 02
Learners are taught to wash hands before eating	Int. 04/p. 03/line. 10
We are from different background so we need to attend social gatherings to learn from each other	OBS. 05/p.01/line. 13
I learnt the different ways of cooking vegetables from indigenous practices.	Int. 07/p. 03/line. 05

Using peels and old rubbish to fertilise the soil	Int.07/p. 03/line.14
A boy at school built a scare crow for the garden	Int. 08/p. 02/line. 07
... “One parent taught us how to catch ants using fats.	Int. 09/p. 03/line. 15
Everyone singing Xhosa songs and doing cultural dances	Int. 09/p.03/line. 12
... “Ask him to get us blue death For the garden”.	Int. 09/p.03/line. 12
... “Sit down when eating- standing is disrespectful”.	OBS. 02/p. 02/line. 11
After learning the importance of nutrition diet I then implemented with my family	OBS. 04/p. 01/line. 11
Many families in the community have started their own gardens	OBS. 05/p 01/line. 21
We need to use the balanced diet skills we have enquired	Int. 01/. 03/line. 16
Improved my cooking skills due to the skills gained as food handlers	Int. 04/p. 01/line. 12
	Int. 06/p. 02/line. 10
	Int. 06/p. 03/line. 01

ANALYTICAL MEMO 12**FUNCTIONAL SKILLS**

"I have acquired management and listening skills..."	Int.01/p.02/line.17
Learning the importance of nutrition/healthy balanced diet, then I decided to start my own family garden at home.	Int.01/p.02/line.19
Learning how to cook properly	Int.02/p.02/line.18
The garden skills that the garden committee enquired can be taken back to the community and use it to improve their lives.	Int.02/p.02/line.04
Knowing the importance of budgeting	Int.02/line.02/line.11
Acquired lots of skills that changed my life tremendously.	Int.10/p.03/line.18
Obtained a lot of gardening skills through helping the garden committee	Int.08/p.03/line.15

ANALYTICAL MEMO 13**PERSONAL TRAIT SKILLS**

"...learnt how to respect each other".	Int.04/p.03/line.20
I have acquired management and listening skills.	Int.01/p.02/line.17
"...learnt the importance of respect".	Int.01/p.02/line.22
Communication skills are very important when a lot of people work together.	Int.04/p.02/line.10
Communication skills go along with respect and listening skills.	Int.04/p.02/line.13
"...as a person you need to be confident".	Int.03/p.03/line.18

ANALYTICAL MEMO 14**TECHNICAL/KNOWLEDGE-BASED**

Helped me enhance my cooking skills	Int.03/p.03/line.20
The one thing that I took from the programme was actually learning how to start my own vegetable garden.	Int.02/p.03/line.13
Obtained a lot of garden skills through helping the garden committee.	Int.03/p.08/line.15

A 9 SCHOOL NUTRITION PROGRAMME MINUTES

SCHOOL NUTRITION PROGRAMME MEETING

25-01-2012

AGENDA: 1. OPENING

2. WELCOMING

3. CREDENTIALS AND APOLOGIES

4. REGISTRATION

5. PURPOSE OF THE MEETING

5.1. MENU WRITE-UP

5.2. Budget

6. CLOSURE

1. OPENING

Ms. Madyaka opened the meeting with a short prayer.

2. WELCOMING

Mr. Lutseke warmly welcomed everyone present to the meeting. He told everyone about a talk show that he was watching yesterday that mentioned that feeding skirts should make sure that the learners are served light meals so that it will be easy to digest and quicker. He ended off by saying "a healthy body equals to a healthy mind".

3. CREDENTIALS AND APOLOGIES

Ms. Tambodala was very proud to announce that everyone expected has attended the meeting and in time. She then jokingly added that even the number one late comer was on time that day.

4. REGISTRATION

All the School Nutrition Programme members signed the attendance register so as to show their presence.

5. PURPOSE OF THE MEETING

5.1 MENU WRITE-UP

Mr. Lutseke mentioned the need for a menu write-up and he also said that it would be better and a time saver if they let the food handlers write it up then hand it in to the coordinator for a review- for the other members to object and add other ideas. In this way they will be sharing different responsibilities amongst themselves. Miss. Makeleni also stood up to remind the handlers to make sure that they keep in mind the budget and the nutrition of the learners.

5.2 BUDGET

The meeting proceeded to the next issue which was the budget. The school manager stated that the budget may be limited but they still had to consider the learner's nutrition. A parent from the meeting suggested that their children start a vegetable garden at school and then eat from those vegetables. She also mentioned that the garden will be their responsibility. They can divide the chores weekly amongst the grades. A parent also asked the food handlers to not cook a lot food as the left overs are usually thrown away.

6. CLOSURE

The meeting was closed in prayer by the school manager and he said everyone will be informed as early about the next meeting.

A 10 CONSENT FORM FOR THE WARD COUNCELOR

FORM : INFORMED CONSENT FOR THE WARD COUNCELLOR

As part of my studies for Masters Degree in Environmental Education at Rhodes University I have to complete participatory action research for which I need your assistance.

The title and brief description of the goal and value of the study

The extent to which school nutrition can be used as a catalyst for community based environmental learning.


The study aims at encouraging social learning between the school and community to alleviate poverty through the use of knowledge constructed when the programme is implemented.


All I am asking of you

Is to allow me to use the school nutrition programme to initiate learning for both the school and the community.

To have access to documents like Training manual, Nutritional policy, School nutrition programme- year plans, Records reflecting allocation of work, Annual reports, Budget.

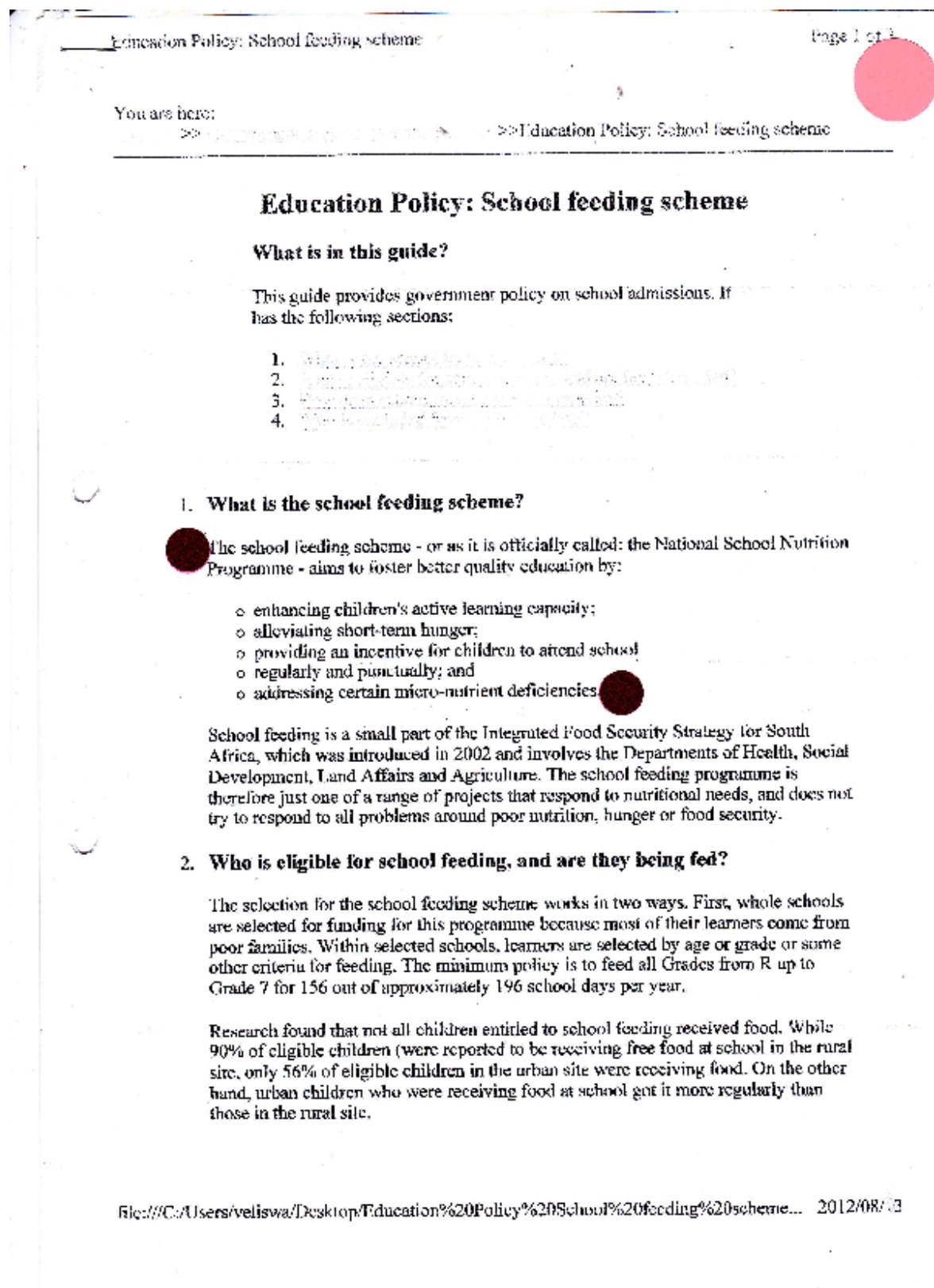
To involve the food handlers and the community at large

Researcher's signature:  Date:.....

Councillor's signature:  Date:.....

INGQUZA HILL LOCAL MUNICIPALITY
WARD 13
P. NTSHOBHO
BOX 336, LUSIKISIKI 4820
CELL: 083 963 5909
DATE:.....SIGN:.....

A 11 DOCUMENT SAMPLE



3. How does school feeding work in practice?

Feeding schemes provides only a small amount of food to help to relieve child hunger and also to relieve poor caregivers from some of the burden of worry when they are unable to provide enough food for their children.

There are a number of common problems with school feeding schemes that parents, teachers and school governing bodies should watch out for:

- While there are 22 approved meal plans, many providers have chosen "cold" menu plans that don't require cooking facilities. The menu consists of brown bread with margarine, peanut butter and jam, served with a powdered milkshake supplement enriched with micro-nutrients. In practice, it appears that children do not always receive all the food that is officially allocated. While the urban schools reported that their stocks were sufficient to provide food regularly, the rural schools did not always have all the ingredients available.
- Parents talk of food disappearing from schools and in some cases, there has been corruption and theft by people providing the food.
- In many areas there is no system of accountability to the parent body. Many caregivers do not know whether their children receive food regularly. Some say that all children in the class receive food, others believe that the programme is only for children whose parents are unemployed, or only for orphaned children.
- Schools do not always operate properly, closing half-way through the morning or not opening at all. During the rainy season the roads in rural areas can become impassable - meaning the bread truck cannot get through to deliver bread and school feeding cannot happen. The milkshakes require water and schools without potable water reported children with diarrhoea.

4. Who is excluded from school feeding?

As with the No-fee Schools and School Fee Exemption policies, children living in areas where schools are too far and/or not operating are practically excluded from the National School Nutrition Programme. But there are also exclusions inherent in the design of this programme. Young children under six years old who are not yet at school cannot access food through the programme.

There is currently no government-funded nutrition programme at high schools, although it has been reported that some provincial departments have used discretionary funding for this purpose. Government will extend feeding to high schools in the next five years.

	Minister of Education	Minister of Health	Minister of Social Development
	Minister of Finance	Minister of Labour	Minister of Transport
	Minister of Water and Sanitation	Minister of Agriculture	Minister of Environmental Affairs
	Minister of Human Resources Development	Minister of Education (Provincial)	Minister of Education (Municipal)
	Minister of Education (Local)	Minister of Education (District)	Minister of Education (Schools)

A 12 OBSERVATION SAMPLE

Obs
01

FIELD NOTE NO: 1

LOCATION: BUSHULA'S J.S.S

OCCASION: SCHOOL NUTRITION WORKSHOP- food handlers by Coordinator

DATE: 24-04-2012

TIME START: 13H30

TIME STOP: 14H45

Observing a workshop held at school by the School Nutrition Coordinator and the food handler. This workshop is about healthy food handling in the kitchen. The coordinator introduces the workshop "the does and don'ts in the kitchen". She has a Generic Training Manual with her. She clearly states that the workshop is just about all of them here to remind each other on how to keep the kitchen clean since the most unwanted germs are found in the kitchen and cleanliness is one of the major priorities with this programme.

E "Germs in the kitchen" this was the theme of the day. Firstly, she briefs them about what germs are how they develop in the kitchen and how to prevent the food borne diseases. The training was fun and both the coordinator and the food handlers all contributed a lot to the workshop and they also gained a lot at the same time. The food handlers proved that they have general knowledge about food borne diseases. We as people tend to forget to wash our hands before eating or handling food- "imagine the things we do during the day then go back home and eat with the same hands", said one of the food handlers. The coordinator adds to that point saying yes, what is the use of washing all your greens then going back and eating with dirty hands".

When they are given an activity about how to prevent food borne diseases, one of the food handlers suggests that one should soak their greens before cooking them but not everyone agreed to that- one of them asks if soaking will not somehow drain out all the nutritious juices. This gets everyone thinking so the coordinator tells them that she will go back and do research on this and she will come back with a broader answer in their next gathering. One of them suggests that fruit needs to be washed before eating or cooking them and it does not matter if they garden fresh or from the supermarket, we still need to wash them. We need to heat or boil ^{well} water before drinking and that our hands need to be washed before handling food. One of the food handlers also

Value

mentions the importance of rinsing our plates and spoons with boiling water before dishing up. The rest of the group agreed to that as we do not know what goes on inside our cupboard.

After all the discussions and other activities were done and put aside, the coordinator asks all the ladies to stay for a cup of tea. I must say that really impressed me because that is one way of getting to know each other better and not on the professional side. When people know each other they can actually work well with each other, especially when it is a team. The ladies were chatting and laughing out loud- I can just see how relaxed they were. The coordinator says, "Its one man for himself- nobody is getting served". The ladies all got up and helped themselves but one of the food handlers kindly asks to be excused because she has to go back home and prepare for her younger ones.