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Exploring the integration of school food gardens as a learning and food security tool at a primary school in Orlando West, Soweto

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2024

University of the Witwatersrand, Johannesburg

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Buthelezi, Bridget Snethemba Samukelisiwe. (2024). Exploring the integration of school food gardens as a learning and food security tool at a primary school in Orlando West, Soweto [Masters dissertation, University of the Witwatersrand, Johannesburg]. WIReDSpace. https://hdl.handle.net/10539/44976

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Exploring the integration of school food gardens as a learning and food security tool at a primary school in Orlando West, Soweto.

by

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School of Education

A dissertation submitted to the Faculty of Humanities, University of Witwatersrand, in fulfilment of the requirements for the degree of Master of Education in Curriculum Studies

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March 2024

Johannesburg

DECLARATION

I declare that this research report is my own original work. The report is being submitted for the Master of Education by Course Work and Research Report in Curriculum Studies. This is the first time that this report is being submitted for examination at any higher institution.

Student Signature: 

10 of March 2024 at the University of Witwatersrand

ABSTRACT

In a school environment, the school food garden serves a variety of purposes. However, in the South African context, there are limited studies that have explored the multifaceted nature of school food gardens. Against this backdrop, the study aims to investigate how a primary school in Soweto works with a food garden to support learning and ensure food security. The data for this qualitative research study was collected through semi-structured interviews with a purposive sampling of four participants, including the principal and three teachers. The transcribed data was coded into themes that were identified and analysed (guided by the GREEN tool which was created by Burt et al. (2016)). The findings show that the purpose of the school food garden is to enhance teaching and learning, as well as to supplement the school's feeding program. Further, the study found that, apart from challenges such as resource shortages and time limitations, learners perceive partaking in school gardening activities as punishment. The study advocates for the need for collaboration with different stakeholders, particularly the government and communities, to span the resource gap and time constraints. Furthermore, it recommends teacher training for the successful integration of the food garden as a teaching and learning tool into the curriculum to reduce negative learners' perceptions of their use in curriculum content delivery.

DEDICATION

I dedicate this dissertation to my son, Kganya. I would not have been able to push as hard as I did if it were not for your constant smiles, which kept me motivated and pushing. I hope this continues to bring a smile to your face. Ngibonga ubukhona bakho.

ACKNOWLEDGEMENTS

I would first like to thank God for giving me all the strengths of this journey. I am grateful for this opportunity to conduct my research dissertation.

This work would not have come to fruition without the unwavering support of my supervisors, Dr. Paul Goldschagg, and Dr. Thandiwe Chidzungu. I am sincerely grateful for the motivation, encouragement, expertise guidance, and positive and constructive feedback from when my research topic was still an idea to a fully fleshed document. Your assistance and guidance helped me realise my dreams.

I am grateful to the primary school participants with whom I conducted my research. Your willingness to participate made this research possible.

To my family, partner, and friends, thank you for the continuous moral support and for believing in and inspiring me to pursue my dreams.

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ABBREVIATIONS

EMS	Economics and Management Sciences
FAO	Food and Agriculture Organisation
FSSA	Food Secured Schools Africa
DBE	Department of Basic Education
GDE	Gauteng Department of Education
GECD	Green Early Childhood Development
GREEN tool	Garden Resources, Education and Environment Nexus tool
IASWECE	International Association for Steiner/Waldorf Early Children Education
NGOs	Non-governmental organisations
NSNP	National School Nutrition Programme
PYE	Presidential Youth Employment
Stats SA	Statistics South Africa
SEED	Schools Environmental Education and Development
US	United States

CHAPTER 1: INTRODUCTION

1.1. Background

Education is argued to be a tool that invokes critical thinking and problem-solving in society by empowering and liberating learners (Freire, 1970). However, Mlachila & Moeletsi (2019) argued that the quality of education in South Africa is low compared to other countries because of the selected teaching methods. They traced low-quality education in South Africa to past political systems of colonisation and apartheid that operated to produce inequalities in societies. These systems selected teaching and learning strategies that disempowered and oppressed learners (Omodan, 2019). Thirty years after achieving democracy, the South African education system has failed to produce quality education because of the continuous enactment of outdated and conventional teaching strategies (Modisaotsile, 2012).

As a result, this vicious cycle reproduces socio-economic crises such as food insecurity faced by different households in the country and worldwide. Food insecurity is caused by poverty, which causes hunger, and is exacerbated by poor quality education (Ninno, 2002). For instance, Mkhize et al (2022) reported that 32.5 percent of the children in South Africa experienced daily food insecurity caused by hunger. Learners' performance and development are, therefore, directly affected because they attend school while hungry (Laurie et al., 2017). According to a report by the Food and Agriculture Organisation (FAO) (2004), children should have access to adequate nutrition daily to provide the nutrients required during their critical cognitive and physical development. The inability of their families, communities, the state welfare system, and schools to address food insecurity is problematic, as it reproduces challenges and barriers experienced by children and communities (Faught et al., 2017).

The National Department of Education has previously been called to play its role and responsibility in changing the current underperformance of education by improving it to empower and liberate learners from social injustice issues, as envisaged by Freire (1970). According to Nelson Mandela, the goal of education is to cause change in the world, which must be realised through the improvement of the education system in schools, where there is power to reach a considerable number of children (Gebremedhin and Joshi, 2016). The knowledge shared in schools is conveyed

through different venues and resources such as school food gardens. Since the 19th century, school food gardens have been used in education for several reasons (Burt, 2016). School food gardens can be defined as “a garden that grows edible plants, fruits, and herbs located on school property and can be used by teachers, volunteers, other school employees, and students during regular school hours and during summer and after-school programs” (Yates and Sullivan, 2017).

Hunter-Adams (2019) asserts that school food gardens are an essential educational and food security tool that can be used to improve the quality of education and reduce the impact of socio-economic issues societies face. Globally, school food gardens have been used as laboratories for learning to enhance the acquisition of knowledge and practical skills (FAO, 2010). Considering the low socioeconomic status of most South African households, school food gardens simultaneously fulfil a critical nutritional role by supplementing school feeding schemes and encouraging nutrition education with learners, particularly from disadvantaged households (Laurie et al., 2017).

The school food gardens are significant in South Africa for addressing the failure of the education system in response to the practical side of learning, which is assessed through the learning outcomes produced in schools (Modisaotsile, 2012). Moreover, most children experience hunger, which further perpetuates poor learning outcomes (Laurie et al., 2017). Thus, a school food garden is a strategy and venue that seeks to capacitate learners with lifelong learning skills and address short-term issues like hunger faced by the learners (Food Secured Schools Africa (FSSA), 2018).

1.2. Research problem

In South Africa, studies conducted on school food gardens are limited. In published research, the focus has been on their contribution to nutrition and feeding schemes (Laurie et al., 2017) and teacher perceptions (Laurie et al., 2013) of a few sustainable gardens. However, there is limited evidence on the role of school food gardens in enhancing learning and addressing food security in urban areas such as Johannesburg. As a result, the quality of education in South Africa is compromised and food insecurity persists. To improve the quality of education in South Africa and address food insecurity concerns, more research is needed on how school food gardens can be integrated as a beneficial tool. Ultimately, this can also provide an

understanding of how youth can be empowered and equipped with relevant practical and lifelong gardening and cultivation skills that will be useful in life beyond the school context.

1.3 Significance of the study

The integration of school food gardens into the school curriculum has the potential to widen learning through hands-on learning experiences that impart gardening skills. To address food insecurity, the South African government introduced and funded a school feeding scheme called the National School Nutrition Programme (NSNP). The NSNP is provided in quintiles of one to three public schools to cater to children from underprivileged backgrounds. There are three pillars outlined in the NSNP one of which is sustainable food production, which encourages the thriving of school food gardens and alleviates short-term hunger. Therefore, the purpose of this case study was to provide evidence of the impact of a school food garden on learning and food security in a primary school located in Orlando West, Soweto. The study area is situated in an urban area that is highly industrialised, with limited access to food gardens and naturally cultivated areas.

The overall purpose of this research was to answer the following main question:

How does the selected primary school in Soweto work with a food garden to support learning and ensure food security?
The sub-questions are:

1. What are the uses of a school food garden in the school?
2. What factors impact the sustainability of the existing school food garden?
3. How do school food gardens impact learning and food security?

1.4. Aim and Objectives

1.4.1 Aim

The study aimed to investigate whether the integration of a school food garden provides support towards learning about healthy nutrition and helps ensure food security in this primary school. To achieve this aim, the following objectives were addressed:

1.4.2 Objectives

1. To establish the uses of a school food garden in the school
2. To determine the factors that impact the sustainability of the existing school food garden.
3. To evaluate the impact of school food gardens on learning and food security

1.5. Theoretical Considerations

This section's main goal is to provide a brief overview of the reviewed literature described in **Chapter 2**. The literature review focuses on giving a quick overview of the background and role of school food gardens as a learning tool and its role in providing food security hence a means to improve nutrition. The school food garden as an experiential learning tool allows learners to reconnect with nature and simultaneously impart various lifelong skills. Concurrently, the school gardens can be a powerful tool in addressing food security in schools by supplementing the school's feeding schemes funded by the South African government.

1.6. Scope of the study, methodology and limitations

The study examined the use of school food gardens as a learning tool and means for providing food security, within one primary school in Soweto, Johannesburg in South Africa. The researcher assumed Dewy's nature study philosophical position and theory was used as the main theoretical framework. A qualitative research approach involving semi-structured interviews was adopted with the selected participants. The data was then analysed using thematic analysis that was coded and arranged according to the objectives of the research that aimed to answer the research question. During data collection, there were time limits that restricted the participants prevented from providing in-depth details of the interviews and other participants from taking part.

1.7. Structure of the report

The report consists of six (6) chapters, **Chapter 1** focuses on putting the research topic into context. The study questions, aims, and objectives are all stated in this chapter. The theoretical concerns and a literature review are presented in **Chapter 2**. This chapter examines the history of food gardens, school food gardens and learning,

school food gardens and food security. **Chapter 3** presents the methodology, research design, philosophical, theoretical framework, study sites, ethical considerations, scope, and limitations. A qualitative research strategy was used to collect data from the participants using a qualitative technique (semi-structured interviews). **Chapter 4** presents the empirical evidence for the role of food gardens as a tool for food security, as a tool for learning, and the pedagogical implications. **Chapter 5** is the discussion of the research findings and **Chapter 6** includes the conclusion and recommendations.

CHAPTER 2: LITERATURE REVIEW

This section outlines the literature relevant to this study. In the Global South, more research is needed on using urban school food gardens as tools for both learning and food security. On the contrary, there is a vast range of research in the Global North on school food gardens. Given the limited research in the Global South, the literature reviewed situates the study in international, regional, and then South African research on school food gardens.

The first section focuses on the historical context of school food gardens. The second section discusses the meaning of school food gardens and their underlying factors. The third section focuses on how school food gardens are used for learning, and the motivations behind them. The fourth section focuses on the use of school food gardens as a food security strategy. The fifth section focuses on how different organizations and communities can be involved in supporting school food gardens. The sixth section highlights the benefits of using school food gardens. Lastly, the section will focus on the challenges relating to school food gardens.

2.1. History of school food gardens

Since its inception, the role of school food gardens has evolved, and they have been recognised as a valuable multifunctional tool. The multi-functionality of school food gardens has been shaped by their rich and lengthy history, with periods of different movements and uses in various contexts (Food and Agriculture Organisation (FAO), 2010). In the early 19th century, the first school food garden movement began with its roots in rural schools, and later in urban schools (Burt, 2016). Initially, food gardens were a site for some form of learning that included but was not limited to, instilling the principle of patriotism and increasing food production during World War II, particularly for urban children in the United States (US) and Europe and for beautification purposes of the urban environment (Blair, 2009). Similarly, Wolsey and Lapp (2014) stated that school food gardens were introduced in urban areas of the Global North as a social transformation strategy for mobilising youth to become active gardening participants. To endorse the school gardening movement, the US Department of Education encouraged schools, churches, and home gardens to supplement school meal programmes to increase food access for schoolchildren (Lawson, 2005 in Burt,

2016). Moreover, schools have made financial resources available to offer technical assistance to maintain and develop school gardens (Burt, 2016).

After some time, a second school gardening movement emerged and continued worldwide. During the second movement, the number of school gardens increased significantly (Desmond & Subramaniam, 2004). In the Global North, school food gardens were integrated into the curriculum of various school subjects, with an increased focus on garden-based learning and natural integration into everyday learning (Wills, 2019; Wolsey & Lapp, 2014; Burt, 2016). During this time, school food gardens were mainly used as laboratories to centralise garden-based learning and enable learners to learn through observation, discovery, and experimentation (hands-on) to advance social and cognitive skill development. In other words, the aim of using the food garden was to provide learners with an empowerment tool that promotes interactive and practical learning experiences (Blair, 2009; Freire, 1970). The use of garden-based learning is motivated by learners' limited exposure to the natural ecosystem caused by industrialisation (Blair, 2009). Thus, school gardens were viewed as staging grounds for building knowledge about the world.

The view of school gardens as an effective medium that connects classrooms, society, and nature was initially advocated by educational theorists and philosophers such as John Comenius, Jean Rousseau, Friedrich Froebel, and later John Dewey and Maria Montessori, who joined in support of nature studies (Burt, 2016). As mentioned above, the theorists firmly believed in the garden's capability to advance learners' social and cognitive development and, to some extent, curiosity, and enthusiasm as they engage with and appreciate nature as a facet of learning (Burt, 2016). For this reason, school gardens have been widely accepted in many parts of the world and have continuously gained popularity with successful integration into the curriculum (Desmond & Subramaniam, 2004). For example, urban areas in the US, Europe, and Asia have successfully integrated school food gardens into the curriculum, as the FAO (2010) mentioned. Recent studies have shown the importance of school gardens in enriching health through their alignment with nutritional education (Jowell, 2011).

Compared to the Global North, more literature needs to be published in the Global South, which reveals the unwritten history of school food gardens. Initially, school food gardens were used for school-based food production, mainly for consumption or

monetary gain (FAO 2004; FAO 2010). For instance, in Rwanda and South Africa, school food gardens are solely used for food production and selling in local food markets (FAO, 2004). In brief, school food gardens were used to generate income that was directed towards addressing economic issues rather than acquiring long-term skills. However, the FAO (2010) points out that such an orientation of school food gardens has proven to be unsustainable and unsuccessful for reasons that include but are not limited to inadequate resources, lack of training, climate change, and inadequate commitment by different stakeholders involved in school food gardens. Otherwise, the FAO (2010) demonstrated that in cases of success, such as in Costa Rica, school gardens were used for nutrition education, environmental awareness, and to complement school feeding programmes, which sought to promote nutrition and education and connect learners to practical issues experienced in societies rather than for sole food production. Thus, the knowledge and skills gained through teaching and hands-on learning about nutrition education, environmental awareness, and health in school food gardens can be implemented by learners to contribute to household food production and security (Burt et al., 2016). Laurie et al. (2017) asserted that the spread of knowledge of food production with the connection to nutrition in households and a broad community depends on the learner's active involvement in school gardening. In other words, the use of school gardens for learning has proven to be a recipe for success. The following section highlights the definition of a school food garden and the factors that lead to its success.

2.2. Definition of a school food garden

There are different definitions of school food gardens, as documented in the literature. According to Yates and Sullivan (2017, p. 307), a school food garden can be defined as "a garden that grows edible plants, fruits, and herbs located on school property and can be used by teachers, volunteers, other school employees, and students during regular school hours and during summer and after-school programs." Burt et al. (2019) argue that school food gardens can be created in containers, greenhouses, school grounds, on rooftops, in raised beds, in the classroom, and even in a community garden, all of which aim to redesign the schoolyard for meaningful use. The purposeful use of school food gardens varies from educational, behavioural, aesthetic, social, and political to environmental (Blair, 2009). However, for the potential of gardens to be realised, they should be well implemented and sustained over time. Burt et al. (2016)

developed what they called a Garden Resources, Education, and Environment Nexus (GREEN) tool, which focuses on the establishment, integration, and sustainability of a school garden. Based on the GREEN tool, Burt et al. (2016) pointed out that a successful and well-integrated school food garden is underpinned by six motivational factors: connectedness to curriculum, embracing school values, having a maintenance plan, providing a learning environment for meaningful experience, valued as part of the community, and be sustainable.

Moreover, Jowell (2011) found that dedication, sufficient land, planting material, water availability, technical support, nutrition education, and active monitoring during school holidays are pivotal elements that constitute a successful school food garden. Thus, the successful integration and sustainability of school food gardens can translate into the development of learning and can bring about positive changes in their households and communities by ensuring long-term food security (Duncan et al., 2016). Therefore, the integration of school food gardens can play a pivotal role in promoting learning and food security, which the FAO (2004) suggests is a primary function of school gardens. In the following section, the learning and food security functions of school food gardens are discussed, along with their underlying motivations.

2.3. School food gardens and learning

Based on their long history, school gardens have been used as valuable educational instruments. The aforementioned theorists strongly believed that school food gardens should be integrated into the school curriculum (Burt, 2016). Learners would connect with nature while gaining direct learning experience and various skills. Thus, curriculum, experiential learning, nutrition, environmental awareness, practical skills development, and community development are considered motivations underpinning school gardens as an educational tool (Wolsey and Lapp, 2014; Laurie et al., 2013, Nowatschin et al. 2017).

2.3.1. Curriculum

According to Wolsey and Lapp (2014), in 21st-century education, school food gardens should be used as an innovative teaching tool that embodies hands-on activities and fosters meaningful learning experiences. For this reason, school food gardens should prioritise learning by integrating it into the core curriculum and extra-curricular activities that have existing educational goals (Wolsey & Lapp, 2014). For example, in New

York, United States of America, the school food garden movement is continuously growing to advance education by being rooted in the curriculum of different subjects (Burt et al., 2019). According to Krupp (2005), school food gardens are well integrated into the Waldorf curriculum, which has since been adopted in many urban schools worldwide. Krupp (2005) stated that any subject teacher can adopt the Waldorf curriculum to serve the educational needs of learners better while providing them with direct and authentic learning experiences. The Waldorf curriculum connects nature and the curriculum by merging the outdoor environment with everyday classroom activities to encourage inquiry-based learning (Love et al., 2015). The Waldorf curriculum aims to holistically develop and empower learners to become agents of societal transformation by developing meaningful learning experiences in sustainable school food gardens (Love et al., 2015).

Blair (2009) and Wolsey and Lapp (2014) found that school food gardens in the curriculum are used to create a dynamic learning environment that offers an opportunity for learners to become active, hands-on, and fully engaged in the experiential learning process as they are stimulated in an authentic and nurturing natural setting. For instance, Nowatschin et al. (2017) demonstrated that school food gardens have been used in urban areas of Canada as a catalyst for learning the core curriculum and social transformation, where learners engage in a stimulating environment. In a South African context, Thembani Primary School in Cape Town integrated a school food garden with the natural sciences curriculum to teach learners eco-lessons and life skills that can empower learners beyond school (Manie, 2021). For Freire (1970), the goal of education is the empowerment and liberation of learners through the impartation of knowledge and skills.

The literature suggests that garden-based learning has been used chiefly to enhance science, nutrition, and environmental studies instruction and outcomes. For instance, learning and understanding topics such as the life cycle, local ecology, sustainability, and conservation have improved in science-related studies (Blair, 2009; Wangfield & Whitfield, 2015). Meanwhile, a study by Beery et al. (2014) found that school food gardens in two Johannesburg schools were interdisciplinary and were linked with various subjects such as natural sciences, social sciences, life orientation, EMS, and others as a learning resource with health education, financial skills development, and problem-solving skills as long-term benefits. In subjects such as business studies,

mathematics, and geography, gardens have been used to understand concepts such as resource sharing, income generation, measurement, weather/climate, and soil erosion (Blair, 2009). Thus, the literature confirms the interdisciplinary nature of garden-based learning.

2.3.2. Experiential learning

Blair (2009) believes that learning in school gardens can encourage experiential learning as learners directly and actively interact with nature and develop inquiry skills. In Arizona, a school garden was used to teach science-related subjects and was found to be an effective instrument for experiential learning as learners gained skills (Moore et al., 2012). In advocacy for experiential learning, Kolb et al. (1999) asserted that when learners participate in school gardening, practical skills are gained and can be carried through beyond the schooling context as learners later reflect on and apply the gardening skills learned. In other words, learners could connect the knowledge learned in the garden with their local environment. Concurrently, in Ralston (2011) John Dewey, the proponent of school food gardens, asserted that skills such as creativity and critical thinking may be accentuated through the constant construction of knowledge and interaction with nature. Experiential learning has improved learners' cognitive skills through interaction with nature. However, Blair (2009) pointed out that cognitive skill development depends on learners' active involvement in experiential learning opportunities. Learners' interactions with nature invoke their curiosity and inquisition, which may lead to high understanding by making sense of the experiential learning process (Blair, 2009). School gardens are an essential tool for experiential learning because they deliver educational lessons in an unconventional rather than traditional way.

2.3.3. Nutrition education

Numerous studies have demonstrated the significance of nutrition in young people's development. Laurie et al. (2017) argued that a child's capability to learn depends on their nutritional intake. Evidently, in South African literature, there is growing support for school food gardens to promote nutritional education in schools (Laurie et al., 2017). School food gardens are viewed as valuable tools for teaching food literacy through nutrition and healthy eating lessons (Laurie et al., 2017). Wangfield and Whitfield (2015) demonstrated that the use of school gardens in nutrition education

plays a crucial role in influencing learners' nutritional decisions and shaping their overall nutritional perceptions by eliciting a positive understanding of nutrition and health. Similar findings have also been reported in South Africa. In Johannesburg, a study by Beery et al. (2014) found that when a school garden was used for teaching nutritional education, perceptual changes influenced learners' preferences for and consumption of fruits and vegetables. Graham and Zidenberg-Cherr (2005) reported that learners were exposed to various vegetables and were willing to taste them. It was also found that active engagement in a school garden could enhance learners' physical activity, which may have direct positive health effects (Laurie et al., 2013). Thus, the use of a school food garden provides a practical learning environment in which learners can obtain nutrition knowledge and understanding that can directly influence their eating behaviour, develop a positive outlook for healthy food, and positively impact their health.

2.3.4. Environmental awareness

Wolsey and Lapp (2014) state that hands-on experiences are essential in enriching learners' comprehension of the world they occupy. Learners who are allowed to directly experience nature and the place they occupy through learning in a school garden can later translate their experience into the development of specific attitudes or values like environmental awareness, which is a factor that addresses the affective domain of learning (Borland, 2022). Moore et al. (2012) point out that the use of gardening as a learning tool is vital for reconciling and connecting learners living in urban areas with nature. Participating in school gardening can help learners understand the evolution of processes and cycles that occur within nature (Blair, 2009). Blair (2009) argues that learning through the garden is the recontextualisation of environmental education, allowing learners to know the link between local and global ecological systems. Learners can understand how local actions can have a profound global impact (Blair, 2009). Thus, learners may engage in discussions centred around sustainable practices and the value of caring for the environment (Borland, 2022). In literature, it has been found that school gardening has positive effects on environmental awareness. For example, Wangfield & Whitfield (2015) demonstrate that through gardening, learners develop respect and appreciation for the environment by having direct experience with nature. In another study, Borland (2022) discovered that learners developed empathy for and commitment to the living

environment. Thus, the environmental values developed in the school garden may aid in the development of practical skills.

2.3.5. Practical skills development

The goal of school learning is to lead to the development of practical skills. Through a school garden, practical and life skills can be developed such as has been done in the Waldorf curriculum (McDermott et al., 1996). The Waldorf curriculum is implemented in different public schools in countries across the world, including South Africa which currently has sixteen schools that implement it (International Association for Steiner/Waldorf Early Childhood Education (IASWECE), n.d). The Waldorf curriculum is underpinned by the principle that learners' acquisition of skills and knowledge is through hands-on experiences and connection to nature, which encourages imagination for optimal learning (Shank, 2016). Thus, the school food gardens are used as learning venues that provide these experiences (Moodian, 2023). In these school food gardens, learners can learn concepts such as planting and preparing seeds which are practical skills that teach them to solve real-life problems (Moodian, 2023). Consequently, learners develop a connection to their societies and become agents of transformation (Moodian, 2023).

Thus, school food gardens offer a practical experience that learners engage in to learn about local food and how it is made available through gardening (Moore et al., 2012). In addition, lessons concerning local food may increase learners' food literacy in terms of how food is produced. Laurie et al. (2013) demonstrate that such skills gained from school gardens can be used to address food security as a relevant societal need that directly affects learners. In addition, school gardens can enable the acquisition of different sustainable life skills, such as ploughing, planting, entrepreneurship, and others, that can be taught to learners so that they can become self-sufficient in the future, choose healthy eating lifestyles, and potentially generate income (FSSA, 2018; Wolsey & Lapp, 2014). Similarly, in Johannesburg, Beery et al. (2014) reported that learners within public and independent schools obtained different skills ranging from cooking, communication, problem-solving, enterprise, and others from learning in a school garden. Moreover, learners are provided with an opportunity to develop cognitive skills and deepen the cultivation of social and interpersonal skills, such as communication and teamwork, that are rarely refined in traditional education (Duncan

et al., 2016; Wolsey & Lapp, 2014). For example, McDermott et al. (1996) reported that there was an increase in cooperation among learners as they worked together in a school garden. Thus, the learners' cooperation may enable community development.

2.3.6. Community development

A school garden provides an opportunity for the development of the local community (Blair, 2009). Learning in school food gardens encourages different participants to work together and become connected as part of the community. For learners, a school food garden facilitates the development of strong connections with community knowledge and practices and the understanding thereof (Love et al., 2015). Love et al. (2015) found that through engagement in school gardening, learners become agents of transformation who participate in their community gardens or local farms to bring about positive change, which fosters a sense of ownership and pride. Thus, learners became valued community members who were equipped with knowledge and skills for improving the community and bringing social change. Similarly, the Schools Environmental Education and Development (SEED) project at Rocklands Primary School, Mitchell's Plain, Cape Town, was established to capacitate learners and community members with multicultural skills (SEED, 2020). In the SEED project, strong connections among community members are created by bringing learners, parents, and the broader local community from diverse cultures together through cultivating food and learning about it (SEED, 2020). Some community members were reported to have developed their home gardens through interaction and training in school food gardens (SEED, 2020).

Recently, in South Africa the Green Early Childhood Development (GECD) program was initiated and sponsored by Vodacom to encourage food gardens across the country to support school children and underprivileged communities (Vodafone Group, 2023). Through the GECD program, the Grasar Day Care Centre in Gauteng, Hulisani Day Care Centre in Limpopo, and Lady Frere Day Care Centre in Eastern Cape were opened in collaboration with community members to ensure food availability and creating the culture of food gardening (Vodafone Group, 2023). In these initiatives, learners and the broader community acquire learning experiences and life skills from each other through regular interaction (Bice et al., 2018). This helps explain why a

school food garden is an essential tool used to capacitate learners and communities with the life skills they need for sustainable living and ensuring daily food security.

2.4. School food gardens and food security

Globally, food insecurity is a crisis that affects people. In 2020, 2.4 billion people were reported to experience food insecurity due to the COVID-19 pandemic (United Nations Development Programme, 2022). Like many other countries worldwide, food insecurity in South Africa has threatened the livelihoods of the majority and negatively affected overall human development (Du Toit et al., 2011). According to Naicker and Molobi (2022), food insecurity in South Africa dates back to the apartheid era when inequalities and social exclusions were prevalent. Statistics South Africa (Stats SA) (2019) highlights that before democracy in South Africa, resources such as land were taken away from non-whites in rural and urban areas, which consequently created food insecurity. Van der Berg et al. (2021) point out that food insecurity persists due to unemployment, inequality, and poverty, which limit food affordability and accessibility, worsen people's standard of living, and perpetuate social inequalities. These underlying factors cause food insecurity to persist due to the high population growth rate, which continuously threatens to exceed the country's ability to meet its needs. Furthermore, van der Berg et al. (2021) revealed that 2.3 million South African households in 2021 experienced food insecurity intricately linked to prevalent poverty rates, inequality, and unemployment, which was propelled by the COVID-19 pandemic.

Recently, the global COVID-19 pandemic, coupled with inflation, has further escalated food insecurity rates and hunger in 2020, with almost 40% of the population in the country being vulnerable (Stats SA, 2022). The cost of living, particularly in urban areas, is relatively high, and involvement in agricultural activities is low due to Eskom's failure to generate sufficient power to meet demand, resulting in regular power outages because of the implemented load shedding (Stats SA, 2022). Load shedding negatively affects farmers who rely on electricity to operate the irrigation and pump systems used for crops (Ali & Imtiaz, 2019). Thus, load shedding in the country has consequently led to a decline in agricultural production that perpetuates food insecurity (Stats SA, 2022).

Stats SA (2019) reported that despite Gauteng being the wealthiest province in South Africa, most of the urban population experienced hunger caused by high unemployment rates. Due to food insecurity, children in schools subsequently end up with low learning performance, while some drop out (Faber et al., 2013). However, through policy and legislation, the South African government has been committed to combat food insecurity by providing agricultural opportunities that aim to broaden people's food needs and increase food security (Du Toit et al., 2011). Stats SA (2019) reported that since the release of the Food and Nutrition Security Policy in 2011, the South African government has been committed to assisting citizens to produce their food and address food security by providing seeds for planting. At the World Food Summit in 1996, food security was believed to "exist when all people have access to sufficient, safe, nutritious food to meet their dietary needs for an active and healthy lifestyle at all times" (FAO, 1996, 1). Du Toit (2011), concurring with FAO (2004), argues that there are three dimensions underpinning food security: food availability, access, and use, which should be attained concurrently to achieve the objectives of food security.

To ensure food security and achieve the underpinning dimensions, in 2006, the South African government introduced the National School Nutrition Programme (NSNP), which is funded through a conditional grant and managed by the Department of Basic Education (DBE) (Laurie et al., 2013). The NSNP aligns with the South African Development Plan, which prioritised food security to alleviate hunger and poverty (National Planning Commission, 2020). Moreover, the NSNP continues to date, to address hunger and malnutrition amongst learners during school hours, by centralising the provision of nutritious and balanced meals to children attending quintile one to three public schools which are non-paying fee schools (Laurie et al., 2013). According to Laurie et al. (2013), the NSNP is rooted in three factors: its feeding programme reduces hunger during school hours, secondly, it ensures sustainable food production in school programmes, and lastly, nutrition education programmes that promote healthy eating. According to the Water Research Commission (2020), the NSNP encourages schools to have food gardens with the aim of fulfilling the goal of sustainable food production whilst contributing to the feeding program.

Beery et al. (2014) argue that school food gardens can widen food security by supplementing the school feeding scheme to increase food availability and access for

school children thus, ensuring that learners are not hungry throughout the school day as there is enough food supplemented by the school food garden (FSSA, 2018). To concur, the DBE (2011) in South Africa believes that school gardens can be used to support school feeding programs by providing fresh and healthy vegetables that will aid in the supply of nutrition in the meals provided to learners. Thus, the nutritional quality of school meals will be improved through school food gardening as children will be exposed to various nutritious foods while simultaneously reducing the incidence of malnutrition, particularly for children from impoverished backgrounds and food-insecure households (FAO, 2004).

The FAO (2004) further demonstrates that school food gardens can increase attendance as children have access to healthy and balanced meals supplemented by a school garden. For example, the Water Research Commission of South Africa collaborated with the DBE to establish two school food gardens in Mamelodi, Pretoria, to supplement the school feeding scheme and ensure that learners eat balanced and healthy meals (Water Research Commission, 2020). In other words, the supplementation of the school feeding program is the food security motivation of school food gardens. For this reason, school food gardens have enormous potential to widen food security in South Africa, mainly through collaborative efforts between the government, organisations, and other stakeholders who can partner with schools to support the sustainability of the gardens.

2.5. Collaborations and community involvement in school food gardens

The sustainability of school food gardens depends on different forms of support systems (FAO, 2004). At the top of the hierarchy, it is argued that there should be political commitment with the government at the forefront of the support system for school gardens (FAO, 2004). The government's commitment should be backed up by national policy documents that stipulate the vision and support for school gardening, and ways of merging with the existing educational goals (FAO, 2004), simultaneously, institutionalising school gardens to become sustainable (Ndayambeje, 2007). For this reason, the government will be actively involved and may further collaborate with different organisations in establishing and managing school food gardens for optimum support (DBE, n.d). For example, in South Africa, within the DBE, there is the NSNP that is still active and utilised across the country and is aided by the EduPlant

programme that is endorsed by Woolworths, a department store in South Africa, to support the school feeding program and nutrition education (DBE, 2014; Food and Trees for Africa, 2022). The partnerships between schools and non-education affiliated sponsors create opportunities for additional funding directed towards technical and practical support required for the garden's sustainability.

At the school level, the FAO (2010) suggests that there should be shared responsibilities and inputs among stakeholders, such as the principals, teachers, parents, and learners, to enable a school food garden's success. However, this means that all the stakeholders should have shared school garden values, and willingness to incorporate the garden into the school culture. This implies that the goal of quality education should be centralised as the fundamental principle that directs school food gardens (Ndayambeje, 2007). Laurie et al. (2017) assert that teachers, principals, administrators, and parents (gardening volunteers) should be adequately trained to actively participate in school food gardens and have an educational impact. The success of the garden is dependent upon the role played by the teachers and principals; thus, they should receive adequate gardening training (Blair, 2009). The training may fuel the teachers' commitment by developing an interest in gardening and equipping them with strategies for linking the garden with the curriculum for experiential education (Nowatschin et al., 2017).

Similarly, the parents' training may provide a community-building component by further promoting home food gardening, which can encourage the development of a community garden (Blair, 2009). Then, the school may collaborate with a community garden and network with other schools that have food gardens to further increase technical support and share ideas for the sustainability of a school garden (Blair, 2009; Moore et al., 2012). Therefore, the partnerships and collaborations with school food gardens will best present learning and food security opportunities for the learners by providing the required support to increase the sustainability of a school garden.

2.6. Benefits associated with school food gardens

Over the years, there has been a significant growing body of evidence which has revealed the benefits of school food gardens. The FAO (2004) categorises the benefits of school food gardens into educational and food security. School food gardens have been found to increase learners' academic, emotional, and mental performance (Blair,

2009). Learners developed enthusiasm towards learning traditional school subjects as they engaged in experiential learning experiences, which improved their overall learning performance and well-being (Blair, 2009). Desmond & Subramaniam (2004) found that school food gardens provide a practical learning environment that enriches theoretical understanding of specific topics and concepts such as environmental and nutritional education.

In other words, the garden increases the educational relevance of learning specific topics and further capacitates learners with life skills. The practicality of learning in the garden allows learners to develop specific skills that they would have otherwise struggled to acquire in the indoor classroom. Skills such as observation, critical analysis, inquiry, and problem-solving are easy to develop in the garden (Desmond & Subramaniam, 2004). In another study, learners gained moral intelligence that empowered them; and had a sense of pride and ownership of their learning process (Moore et al., 2012). Moral intelligence was then gained because learners reported having had pleasure and enjoyment in learning outside compared to the indoor classroom (Passy, 2014; Laurie et al., 2013). In terms of physical benefits, Wangfield & Whitfield (2015) reported that learners' engagement in gardening promoted physical exercise. In other words, learners' health is considered and improved through constructive activity engagement.

Regarding food security, a school food garden plays a fundamental role in addressing food insecurity and developing methods and skills for surviving among learners. The produce from a school garden can improve the nutritional quality of food by supplementing the school feeding scheme. As a result, hunger may be reduced during school hours and optimise learners' focus in classrooms. A school garden can also improve food availability and diversity in the school feeding scheme (Water Research Commission, 2020). Furthermore, in the garden, learners can be taught sustainable food production methods to address long-term food security (FAO, 2004). As a result, learners may be encouraged to start their home gardens by implementing the skills taught in a school garden.

The benefits of school food gardens can become economic for learners and community members from low-income backgrounds (Eichberger, 2016). It was found that school food gardens may create opportunities for income generation that will

enable learners to sell the produce from their gardens (FAO, 2004; Manie, 2021). According to the Water Research Commission (2020), the produce from the small food gardens that learners and the community may develop may be sold in farmer's markets to generate income and create networks with other farmers. For instance, in Rwanda, learners and the community greatly benefitted economically by obtaining the economic value of small-scale farming by selling fruits and vegetables from their food gardens (Ndayambeje, 2007).

2.7. Challenges faced by the existing school food gardens

Regardless of all the compelling benefits, some challenges and barriers hinder schools from effectively integrating and sustaining food gardens. Resources and support are the leading factors hindering school food gardens (Burt et al., 2019). Funding has been proven to be the most widespread support factor that becomes an obstacle to the sustainability of school gardens (Burt et al., 2019; Moore et al., 2012). Burt et al. (2019) assert that enough budget is pivotal for the operation of the garden.

Meanwhile, in terms of support, inadequate teacher training on the effective use of the garden has been discovered to be a barrier (Kincy et al., 2016). In the study, teachers needed more time and expertise on how the garden could be integrated into the curriculum (Kincy et al., 2016). There were negative perceptions and a lack of interest among the teachers (Kincy et al., 2016; Blair, 2009). In another study, community involvement is a hindrance to the success of school food gardens (Burt et al., 2019). It was argued that community involvement provides adequate support for the garden's sustainability (Burt et al., 2019). The community members who may be trained or have experience in gardening may capacitate others with the necessary skills needed for gardening and even volunteer to look after the garden during school holidays. Thus, without community involvement, school gardens fail to continue running sustainably (Burt et al., 2019). However, Laurie et al. (2013) argue that the stigma centred around gardening in communities needs to be addressed, which may enable greater community engagement. Non-governmental organisations (NGOs) may form part of support that provides further funding to enrich the sustainability of a school food garden.

Ndayambeje (2007) points out that the physical characteristics of the location of a school food garden limit its sustainability. The shortage of water is the leading factor

that becomes an obstacle to the sustainability of school food gardens (Ndayambeje, 2007). The water shortages are linked to the climatic conditions and changes which reduce the levels of annual rainfall (Nhemachena et al., 2020). As a result, the performance of gardening is affected and subsequently reduces the production of crops (Nhemachena et al., 2020). The soil fertility and moisture are another contributing factor that affects the quality and nutritional value of the crops in the school food garden (Moges & Holden, 2008). Soil fertility and moisture are viewed as essential elements that improve the growth of crops (Kiboi et al., 2019). In other words, the lack of soil moisture and fertility, however, negatively impacts the production of crops. Moges & Holden (2008) further found that food gardens that are situated along the upper and middle slopes produce quality crops compared to crops that are on a lower slope.

2.8. Conclusion

Integrating school food gardens into the curriculum has proven to yield significant benefits for learners in both the Global North and Global South urban areas. Indeed, Duncan et al. (2016) and Beery et al. (2014) have argued convincingly that food gardens have a significant role to play in nutrition. To concur, FOA (2010) believed that using food gardens for learning is more beneficial and sustainable, which should be schools' main focus. The school gardens can also be a powerful tool in addressing food security in schools by supplementing the school's feeding schemes (Beery et al., 2014). Thus, to fully realise the potential and reap the benefits of the school food gardens, they should be used as a tool for both learning and food security. However, the challenges that exist in the food gardens need to be addressed for the continuous reap of the benefits. In the following chapter, the study's methodological design will be described in detail.

CHAPTER 3: METHODOLOGY

In this chapter, I describe the research methodology and the rationale behind the methodological decisions that were taken to address the key research question. The research question for the study is: How does a primary school in Soweto work with a food garden to support learning and ensure food security? I first discuss the philosophical rationale of food gardens and the informing theoretical framework. I followed by describing the research approach, which was qualitative, and its justification. I then highlight the reasons behind choosing a case study as a research design choice. Thereafter, I explained the sampling strategy that I used to select the participants for the interviews. Interviews will be discussed as the data collection instrument that I chose for the study. I follow by highlighting the analysis method that I used for the interviews, which is thematic analysis. Lastly, I describe the ethical considerations for the study.

3.1. Philosophical rationale and theoretical framework

3.1.1. Philosophical rationale of school food gardens

Different theorists and philosophers have long supported the idea of school gardening. Among the leading philosophers, was John Dewey, who provided profound advocacy for school gardening through his enthusiasm for nature study (Ralston, 2011). Dewey (1996) recognised the dynamic nature of school gardening as an outdoor activity that allows learners, particularly those from urban areas, to have a direct learning experience with nature to gain a practical understanding of knowledge. Dewey (1996) points out that the school garden provides a balance between theoretical and practical knowledge rather than an exclusive focus on each. In other words, the school food garden becomes a useful resource to bridge the gap between theory and practice, through which learners can contextualise and understand the school subjects.

Through school gardening, there is fostered social progress and reform through the learner's active involvement (Dewey, 1996). For Dewey (1996), this meant that the school garden reconnects learners with others through social interactions. As a result, there are increased opportunities for collaboration, learning, and solidarity. In South Africa, a study by Beery et al. (2014) found that learners had an increased knowledge about where food comes from as they learn with others, which informs their decisions regarding what they consume. For this reason, the school food gardens possess great

potential as an educational tool. Dewey's and Beery's work provides practical and learning implications that substantiate the need for the integration of school gardens as an educational tool. Therefore, these contributions to school gardening provide a foundation by which to explain the theoretical framework of the study, which is centred on experiential learning, which will be discussed in the following section.

3.1.2. Theoretical framework

The theoretical framework of this study primarily focuses on experiential learning proposed by Kolb in support of school food gardens (Kolb et al., 1999). Kolb's explanation of experiential learning is influenced by John Dewey's rationale for school gardens as an educational tool. Experiential learning is a form of hands-on learning experience that fosters the learner's dependency on the construction of knowledge, skills, and values (Kolb et al., 1999). School food gardens are authentic learning spaces that encourage this construction through observation and reflection on their experiences of nature, thus developing concrete concepts that can later become abstract concepts through trialling in new situations (Kolb et al., 1999). However, this means that the key ingredient for the shift to happen is learners' intrinsic motivation, facilitated by the teacher's guidance to encourage reflection and application of the lessons learned in a new context. In the context of the study, learners may engage in direct learning experiences in the garden while simultaneously observing the school food garden and thereafter, reflecting to construct knowledge and understanding of a specific concept, such as nutrition provided by vegetables. Later, learners may then apply the knowledge at home to develop their home gardens.

Based on Kolb's experiential learning, a school food garden enables collaboration through learners' active involvement and interaction with peers and the teacher (Kolb et al., 1999). Thus, knowledge can be co-constructed through social interactions among learners. In other words, it is possible to argue that Vygotsky's (1931a) socio-constructivism serves as the foundation for experiential learning. In experiential learning, learners may communicate and work together in the garden to address real-life problems such as food insecurity in the school and beyond (Ralston, 2014). Therefore, learners' active involvement and engagement in school food gardens can improve learning by developing high-thinking skills and addressing food security through the transfer of knowledge and skills to the real world.

3.2 Research approach

A qualitative research approach was chosen to explore how the school uses a food garden to support learning and ensure food security. While the quantitative research approach seeks to find meaning through numbers and measurements, qualitative research, on the other hand, is concerned with understandings that are derived from an individual's subjective experiences (Hammarberg et al., 2016; Stake, 2010). In the past, the selection of qualitative research raised questions about its validity and reliability in comparison with quantitative research (Stake, 2010). Despite the scrutiny, researchers choose a qualitative approach to understand and depict the individual's social and complex experiences in the context of continuously changing societies (Hammarberg et al., 2016; Maxwell, 2008). Apart from the respective distinctions between the qualitative and quantitative research approaches, they are equally significant in finding meaning and understanding of the world.

A qualitative research approach is informed by interpretivism, which regards reality as a social construct that comes from multifaceted and subjective realities and interpretations (Starman, 2013; Berger & Luckmann, 2023). For this reason, the context of the research problem and its details are more important to qualitative research than the correlation of numbers. In my study, the interview questions for a qualitative approach were used to create conversations and discussions which unravelled how a school food garden is integrated into teaching and learning and ensuring food security within the context of the school and the experiences of teachers. The interview questions were structured and analysed through the use of the GREEN tool by Burt et al. (2016).

Burt et al. (2016) developed a GREEN tool to set a blueprint of factors that guide the establishment, integration, and sustainability of food gardens in schools. Based on the GREEN tool, Burt et al. (2016) pointed out that a successful and well-integrated school food garden is underpinned by six important factors: connectedness to curriculum, embracing school values, having a maintenance plan, providing a learning environment for a meaningful experience, valued as part of the community, and sustainable.

3.3 Research design

A case study strategy was adopted in this research. Previously, less attention has been given to case study research (Starman, 2013). However, in “practice-oriented fields” where understanding of reality is a social construct derived from an individual’s interpretation of their experiences, they have proven to have significance (Starman, 2013; Merriam, 1988). For this research, I selected a primary school in Orlando West as a case study to explore how the already existing food garden is used to support learning and ensure food security within the school. The goal of the case study was to understand the “how” and “why” of the food garden uses in this context. These questions regarding the phenomenon are key for a case study because they reveal its complexity and the existing dynamics that would otherwise be unknown to non-participants (Yin, 2002). I chose the school to unearth the reasons why a school food garden was established because in South Africa few schools have food gardens.

3.4 Sampling strategy

To gather the data needed for the study, it was important for the researcher to choose a sample of participants using a specific procedure. According to Robinson (2014), participant sampling is pivotal in determining an understanding of the subjective realities of the participants in a qualitative study. In qualitative research, the participants determine the richness of the conclusions that will be drawn from the participants’ interpretations of their experiences. Below, the methodological decisions for the sampling of participants for the study will be reviewed.

3.4.1 Participants

A purposeful sample was chosen for the study. Purposeful sampling is argued to be a technique that is mostly selected to develop an in-depth understanding of a specific phenomenon rather than develop the breadth of understanding intended by quantitative techniques (Palinkas et al., 2015). Individuals with experiences and knowledge of the phenomenon are key for purposeful sampling in constructing meaning and understanding (Palinkas et al., 2015; Merriam, 1988). In this study, a sampling of four participants was made for the interviews. These were the school principal and three subject teachers who were selected, based on their regular participation in gardening activities and willingness to participate in the study. As

Coynet (1997), points out, purposively selected participants may bring forth different and deep insights based on their experiences with the topic at hand.

The sampling criteria of participants sought to yield “information-rich data” (Patton, 1990) for the study by eliciting participants’ experiences with their involvement in a school food garden. To understand how the school runs and sustains a food garden, I first looked for a teacher who was actively involved with the maintenance of the food garden. In this regard, the school principal was interviewed because she is an active member of the garden committee. I also looked for three different teachers who teach Life Skills, Social Sciences and Natural Sciences because the subjects have concepts of soil, weather, plants life cycle, etc. that relate to a garden as a potential teaching and learning resource. Two teachers that I interviewed had previously used the garden as a teaching and learning tool, while one had no experience. The two male participants had 3- and 8-years teaching experience, and a female participant had 12 years which had limited impact on the insights provided.

3.5 Data collection

To collect data, semi-structured interviews were chosen and conducted with the participants who were willing and able to participate in the study. Each participant was interviewed face to face for 30 minutes to allow ample time to unearth the uses of the school food garden and obtain clarity of the responses. A semi-structured interview was chosen because it enabled the researcher to obtain data on unknown information that is key to understanding a specific experience and may otherwise be inaccessible through observation (DiCicco-Bloom & Crabtree, 2006). As a result, the interviews enabled the researcher to be at the forefront of their research (Barriball, 1994). Participants during semi-structured interviews were provided with the opportunity of free will to interpret and expand on their subjective experiences when answering the questions that emerged (DiCicco-Bloom & Crabtree, 2006). This is due to the open-ended question design that promoted a dialogue with the participants as opposed to close-ended questions that discouraged it (Longhurst, 2016).

The interviews were conducted for this case study because the school has a well-established food garden that was started in 2021 in collaboration with two community organisations. The organisations are registered and funded community NGOs to focus on serving the community by bridging the food security gap and spreading gardening

education. The questions that were posed to the participants were context-specific to the school and had two sections that examined the technical and pedagogical-related aspects of a food garden and the challenges thereof.

3.6 Data analysis

Data analysis in qualitative research can be a tedious process that requires order, structure, and making meaning of the provided data (Braun & Clarke, 2012). The collected data requires that it be organised along developed themes (Braun & Clarke, 2012). I analysed my data through the interpretation of the content of the interviews. The data from the interview recordings was first saved to my password-protected computer and thereafter retrieved for transcription. I organised and coded the transcribed data into themes that I identified and was guided by the GREEN tool that was created by Burt et al. (2016), as forementioned earlier. The GREEN tool was applied for the thematic analysis to highlight the interrelated aspects of a school food garden. The emerging common themes guided by the key aspects of the GREEN tool were categorised into the garden's main uses, educational curriculum integration, food security and school feeding scheme and challenges related to the use. The themes were arranged according to the objectives of the research that answered the research questions which then led to the results-drafting process.

3.7 Ethical considerations

The interaction with participants requires that a researcher obtain permission before conducting any research activities (Orb, et al., 2001). In this context, I first applied for an ethics clearance certificate from the ethics committee of the University of Witwatersrand along with research permission requests from the Gauteng Department of Education (GDE) and the school principal. The conditions for the GDE research permission were that research activities were permitted until September 30, 2023. Once permission was granted from both the ethics committee with the Ethics protocol number: 2023ECE022M and GDE, interviews then commenced.

Before going to the school, the first attempt was to contact the school electronically to request permission from the principal. However, the internet-accessed numbers, and the email address no longer exist. Then the next option was to physically visit the school to ask for permission to conduct research from the principal which was then granted. I requested to conduct interviews with the principal and three other teachers

in the school. On the day of the interviews, I first provided and explained the participant's information sheet of the research and the consent form details to all the willing participants before the interviews. Thereafter, I asked the participants to sign the consent forms approved by the ethics committee to state that they agreed to be audio recorded during the interview. Following the ethics guidelines, I maintained the confidentiality and anonymity of the participants by withholding their identity details in this report.

3.8 Conclusion

This chapter started by providing a rationale and outlining the methodology. Thereafter, I presented the research philosophy of the methodology chapter that justified and laid the foundation for the choice of the philosophical framework that I discussed. I then discussed the research design, followed by the sampling strategy that I used for the study. Thereafter, the use of interviews for data collection was discussed and justified followed by the analysis of the interviews that were thematically analysed. I then concluded the chapter with a discussion of ethical considerations for the study. In the next chapter, I will apply the chosen methodology to analyse the data.

CHAPTER 4: RESULTS

This chapter presents the results gathered from the interviews with the participants. A total of four participants involved with a food garden took part in the interviews. The first section of the chapter will provide an overview of the context of the school. Then, considering the key themes of the GREEN tool that Burt et al. (2016) proposed as a guide, I present the specific results from the interviews. The themes that emerged from the analysis were based on the technical and practical basis of the use of a food garden in the school that I researched. Lastly, I discuss the challenges that exist with the use of a food garden.

4.1 The school context and a food garden

The primary school selected is a non-fee-paying school located in Orlando West, a township in Johannesburg South (Soweto). The school has approximately six hundred learners, mostly from underprivileged families. The parents of these learners are Black African people who have diversified income levels with a majority either unemployed or receiving low income, and the minority receiving middle income. As a result, the majority of families are unable to afford a healthy and balanced diet. Two non-profit organisations based within the community initially established a school food garden. Initially, the organisations largely collaborated with the community members rather than the school. However, the garden is now being solely run by the school because the organisations are no longer involved.

The establishment of a food garden aimed to alleviate poverty and hunger, along with the provision of nutrition education empowerment for the community. Since its establishment, the school food garden in Orlando West has managed to bridge some food gaps by giving away vegetable surpluses to the learners in need and supplementing the school feeding scheme. In this context, it reveals that a food garden is mainly used to supplement the feeding scheme and assist learners from underprivileged backgrounds with food supplies, even when they are away from school. In addition, the school garden has also been reported by teachers to be used for teaching and learning in a few subjects such as life skills, social sciences and natural sciences which is a form of knowledge empowerment for the learners.

4.2 The current conditions of the food garden

The current conditions of a food garden are significant because they reveal the technical aspects of the garden. In the school, no cases of pests and diseases have been reported which minimises the exposure to risk factors like food poisoning and reduces the produce waste. However, in one season, the school has experienced a slow growth of crops which has been addressed using environmentally friendly fertilisers. Since then, the fertiliser is applied by the garden committee and after each season ends, crop rotation is undertaken to prepare the soil for the subsequent sow. The use of fertiliser is practical evidence that there is a maintenance plan for the school food garden.

As per the guidelines of the GREEN tool, a well-developed food garden should have a maintenance plan, embrace school values, be valued as part of the community, and be sustainable (Burt et al., 2016). In this context, there is a garden committee that consists of two general workers or caretakers, a principal, and PYE (Presidential Youth Employment) personnel who are all responsible for the maintenance of the school food garden. The school's garden committee looks after the garden and harvests ripe vegetables during school holidays to ensure that the plants never die out. The harvested produce is then handed to the impoverished families of the identified learners in the school. In this context, the existence of the school food garden embraces and supports the school values of community and a sense of belonging and provides a conducive and supportive learning space.

According to one participant:

> "The food garden provides learners with food and important gardening skills as well as other life skills, which aligns with the school's goal to provide a home away from home and establish unity through food and collaboration" (The Principal, interview 1, 2023).

The school food garden is greatly supported by the principal and teachers who were the main interviewed participants based on their willingness to participate. The principal is at the forefront of the gardening activities and an active member of the garden committee. During informal conversations, the principal explained that she has a garden at home which extends her passion for gardening. The teachers are mainly involved by utilising the garden for teaching and learning and recognise the great

uniqueness of a school food garden compared to the traditional classroom-based teaching and learning practices.

However, the food garden has not received much support from the community. According to participants, parents are not involved in any gardening activities; they believe it is a school project; hence they are not duty-bound. For this reason, it can be concluded that the community does not value the school's food garden, and this puts a compromise on its viability. The community's recognition of the importance of the school food garden is key in addressing their negative perception. The next section presents the practical and technical basis of the food garden and the challenges therein.

4.3 The practical and technical basis of the food garden

This section presents the findings on the practical and technical basis of the food garden as it points to food security and the feeding scheme, teaching, and learning, as well as the technical and pedagogic challenges therein.

4.3.1 Food Security and Feeding Scheme Tool

Within school hours, a school food garden addresses food security during lunchtime. This is through the supplementation of a school feeding scheme. The principal reported that since the first harvest of the ripened vegetables from the garden, they have been used to supplement the school feeding scheme during breakfast and lunchtime for approximately 500 out of 700 learners in the school. This way, the learners have access to a variety of fresh vegetables that may otherwise be unavailable in the school feeding scheme. The principal stated:

> "The main vegetables produced in the garden include cabbage, spinach, potatoes, onions, peppers, carrots, pumpkins, beetroot, and sweet potatoes which contain different key nutrients for a child's development." (The principal, Interview 1, 2023).

She further explained that these vegetables are selected because they are easy to grow and manage throughout the year. In cases of ripened vegetable surplus and a few days before the school holidays, learners are given the produce and food from the feeding scheme to take home. This extract is insightful in understanding that the

school is trying to bridge the food security gap for the learners and their households that experience poverty and need assistance with food supply.

4.3.2 Teaching and Learning Tools

The food garden was found to be used for teaching and learning the curriculum of two subjects which are Natural Sciences, and Social Sciences. Teacher A is a Natural Sciences teacher who has been in the school for 8 years and has previously used a food garden to forge the practical side of learning through experiments. Teacher A explained that,

> "In science, a food garden is very important and necessary because learners can investigate different plants and animals that use the garden as their natural habitat. The garden bridges the gap between theory and real-life application of learning." (Interview 2, 2023)

Similarly, in the Social Sciences (SS) subject, a food garden is used for teaching and learning, despite the less teaching experience of 3 years. Teacher C reported that,

> "In SS, the school food garden was used to teach the soil…Learners experienced how plants grow in diverse types of soil. In the garden, they get to understand SS concepts much better." (Interview 4, 2023)

In addition to providing a practical side of learning, a food garden has positive consequences. It can bring out the element of being in tune with the environment and encourage the contextualisation of the content. Learners may find it easy to learn as they have first-hand experience of what they are learning about.

Teacher C described that:

> "Learners show such great and heightened interest in what is being taught… Learners get to see, feel, and smell different things in a food garden, and they get to observe different plants and how they either thrive or not survive in different environments such as in and out of a greenhouse."

Similarly, Teacher A said that,

> "Teaching in the garden is unique; it enables learners to interact with their environment first-hand."

However, a teacher with more teaching experience within the school has not used a food garden before but has only observed others use it. Teacher B reported that,

> "I have not used the school garden before. My experience has only been observation. It has always been my intention to use the garden to teach life skills but due to time limitations, I have not yet fulfilled my intention…But am afraid that teaching in the food garden might waste time because some learners may not take learning outside seriously due to distractions and a desire to play instead of learning." (Interview 3, 2023)

Even though Teacher B realises the uniqueness of teaching and learning in a food garden, she mentioned that "Teaching and learning in the garden looks like fun and most learning skills are included". However, the time constraints and learners' distractions were mentioned as hindrances for stopping Teacher B from conducting lessons in the food garden.

In this context, even though not all the school subject teachers use a food garden for teaching and learning, all three teachers give insight into the significance of the garden in enabling a learning environment that provides meaningful experiences. This is through the connection of the school food garden to the curriculum and reality, intending to impart lifelong skills and create a social learning space. Thus, a food garden in the school in Orlando West is well-developed because it is an educational resource that caters for the educational needs of learners.

4.4 Challenges experienced with a food garden

The following result section details the technical and pedagogical-related challenges experienced with a school food garden. The teachers mentioned several difficulties with a food garden during the interviews. The technical-related challenges will be reported first followed by the pedagogical-related challenges, respectively.

4.4.1 Technical challenges

Firstly, the school previously worked with two community organisations, as mentioned earlier, which established a food garden that was initially created to serve the community. However, according to participants interviewed, the two community organisations that formed part of the garden committee withdrew because the school stakeholders wanted a food garden to be controlled internally rather than externally by

the organisations. In this context, the stakeholders refer to the school governing body which includes the principal, teachers, parents, and learners along with the caretakers. This challenge was further articulated in detail by the principal, who mentioned that:

> "The problem with the two organisations was that they did not want the school to be at the forefront of gardening activities. These organisations treated the garden as their own rather than a shared space with the school and this made them benefit more than the school." (Interview 1, personal communication, 2023)".

Secondly, the resources were identified as another technical challenge experienced by the school with a food garden during interviews. The resources that are referred to in this context are funding needed for the purchase of seeds, fertilisers, and garden tools for the maintenance of the garden. The interviewed teachers and the principal expressed funding as a leading challenge. Since the parting of the organisations, the school has not had sponsorship of tools and seeds which assisted with the maintenance of a food garden. This led to the school having to fundraise or use the school funds. On funding, one teacher explained that,

> "There is no funding. The garden has been sustained through accessible resources such as fundraisers that are available in the school. The school is obligated to use school funds. There is a pressing need for sponsorship that may produce the funds for sustaining the garden by ensuring that all the required tools are made available." (The principal, Interview 1, 2023)

Another challenge is the garden tools that were mentioned to be inadequate, which limits the gardening activities, as highlighted by the principal. The garden tools include "shovels, forks, hosepipes, gloves, boots, and a wheelbarrow." (The Principal, Interview, 2023). The technical challenges are not the only ones experienced in the school; the following section will present the pedagogically related food garden challenges.

4.4.2 Pedagogical challenges

Pedagogical challenges are all the problems relating to teaching and learning in a food garden. Teachers observed different challenges with teaching and learning in a food

garden. Time, concentration, and negative perceptions were the main challenges that the teachers highlighted, respectively.

Time was viewed as a hindrance to effective teaching and learning in the garden. The teachers said that they never get enough time to teach in the food garden because of the allocated time scheduled for their subjects. One teacher mentioned that,

> "The schedule to teach in the school garden has been a hindrance. There is less time given to my subject for the curriculum coverage in a week. Learners never get enough time in the garden." (Teacher A, Interview 2, 2023)

Another challenge observed by the teachers with the use of a food garden for teaching and learning was learners' concentration span. Learners were found to have less concentration when in a food garden. The teachers believed that they were easily distracted. One teacher stated,

> "There are less concentration levels as some learners may take learning outside the classroom as an opportunity to play around rather than taking the lesson seriously." (Teacher B, Interview 3, 2023)

Teacher C explained that she has not yet used the garden because of the type of learner she teaches. She considers the learners to be hyper, which makes it easy for them to be distracted. This then may waste teaching time and set them back.

The last challenges that were found by the teachers with teaching and learning in the garden were the negative perceptions that learners have due to their limited understanding and knowledge about food gardening. Teacher B explained that,

> "Some learners do not take gardening seriously because they have a perception that it is hard labour that is out of fashion and does not align with highly skilled jobs." (Interview 3, 2023)

Another teacher said that these negative perceptions stem from the use of the garden as a punishment tool for misbehaving learners in grades 5, 6, or 7. Teacher A mentioned that,

> "Some teachers use the garden as punishment for the misbehaving learners which then leads to a negative viewpoint and perception towards gardening." (Interview 2, 2023)

The use of the garden for punishment in this school is customary practice for most teachers because it is believed that doing non-academic work is punishment for learners. However, teachers who envision the teaching and learning potential of a food garden believe that this practice is faulty.

In support, Teacher A believes that using a food garden as a punishment tool is a wrong practice that teachers should discontinue because it perpetuates the idea that gardening is for punishment rather than beneficial (Interview 2, personal communication, 2023).

The use of the garden for punishment conditions the learners to develop negative perceptions about the food garden instead of viewing it in a positive light.

4.5 Conclusion

This chapter began with a clarification of the interviews that were used as a research tool for data collection in the school. Thereafter, the results were organised into themes that were constructed through thematic analysis for the conducted interviews. In the results, the context of the school was first described to explain why a school food garden is a valuable resource for the learners and the community. Secondly, the current conditions of the garden were examined as an assessment of its sustainability. Thereafter, the garden core practices of the school were categorised into food security and teaching.

It was found that the garden is used for both food security through the supplementation of the school feeding scheme and teaching as an instruction resource that guides the lesson. Lastly, the chapter concluded by presenting the challenges that are experienced in the school with a food garden. It was found that the challenges are both technical and pedagogical; these concern the lack of resources, political disputes, time constraints, lack of concentration, negative perceptions that stem from negative teachings and the use of the garden as punishment. In the next chapter, the results of the study that were gathered will be discussed, and conclusions drawn for the research along with the recommendations and implications thereinafter.

CHAPTER 5: DISCUSSION AND CONCLUSION

The results of this study shed light on how a school integrates a food garden into two categories: learning and food security, which increases its knowledge in South Africa. In this chapter, I provide a discussion of the key findings of the research design along with the implications for the interpretation of the results. I then follow with recommendations of practice for future research drawn from the literature. The limitations that I experienced during data collection are then discussed. Lastly, the chapter concludes with the overall findings of the research.

5.1 The study's key findings

Two key findings and areas of discussion were revealed in this study, namely, the use of the garden for food security and teaching and learning along with the challenges experienced.

5.1.1 Use of the food garden for security

The study shows that the garden programme in this primary school is centred on the food security role that it plays. The participants stated that the garden provides vegetables to address food security by supplementing the food-feeding scheme. The school is a non-paying fee school with a school feeding scheme that is supplemented by a food garden. The learners in the school come from households that cannot afford enough food, hence the need for a feeding scheme. The role played by the food garden in diversifying food in the school is important, mainly for learners from disadvantaged backgrounds as research supported by Laurie et al. (2017) and Lawson (2015) in Burt (2016).

The study findings and reviewed literature demonstrate that the benefits of food gardens are beyond the supplementation of feeding schemes through the provision of vegetables, these benefits range from physical, emotional, and mental that learners gain as they engage with nature (Truong et al., 2016). Wolsey & Lapp (2014) found that health improvement and entrepreneurial skills are the additional long-term benefits related to food gardens. Truong et al. (2016) revealed that these life skills are considered important because they have a long-term effect on an individual, even after they leave school. However, these benefits do not disregard the role played by food gardens in supplementing the school feeding scheme. Other benefits were also noted

by the participant teachers in the use of food gardens for learning, which are discussed in the following section.

5.1.2 Teaching and learning, and the garden

The study demonstrated that the use of school food gardens has great learning potential. During the interviews, it was found that learners get to be actively involved in a food garden through experiential learning as they engage in teaching and learning activities to make meaning and understand concepts. This is most significant for learners who are disadvantaged by the school system that focuses on theory and least on the practical aspect of learning. To concur, the findings of Beery et al. (2014) discovered that children's engagement in a food garden is vital for the acquisition of knowledge and skills that would otherwise be difficult to achieve in a normal classroom setting. For this reason, the school food garden serves a great empowerment purpose for learners by increasing epistemological access through the gaining of knowledge and skills.

The participants revealed that learners have shown academic improvements in social and natural sciences following teaching and learning in the garden. The findings correlate with Blair (2009) who demonstrated that the use of school food gardens for learning has yielded improvements in academic performance and social interactions. Learners have shown a better understanding of the concepts, particularly in science where reality should be merged into the curriculum (Blair, 2009). Hence, this bridges the gap between theory and practice and fosters learning that reconnects learners with themselves, others, and nature (Truong et al., 2016). The educational benefits of school food gardens provide a renewed focus on alternative ways of teaching and learning the curriculum in education. This highlights the significance of the school food gardens which Beery et al. (2014) believe could be fully experienced in various contexts through appropriate teacher training which may overcome various challenges that can influence the sustainability of the garden. In the following sections, the challenges that the school experiences with the food garden are discussed below.

5.1.3 Technical and Pedagogical Challenges

The study also analysed the current conditions of a school garden and found that technical support provided by the gardening committee positively affects the sustainability of a food garden, even after the two community organisations

disengaged from the school. Conversely, it was found that the lack of community involvement reduces the chances of a food garden being sustainable (Burt et al., 2019). Despite the positive proactivity of the garden committee, technical and pedagogical-related garden challenges in this context were experienced.

The results of this study reveal challenges that are technical in terms of a lack of resources and political disputes between the school and the community NGOs that were involved. Burt et al. (2019) found that plenty of studies focus on technical challenges with resources at the forefront and rarely on pedagogical challenges. However, in this context, the pedagogical challenges were experienced, and they relate to time constraints, lack of concentration and negative perceptions by learners due to punishment and negative beliefs about gardening. In terms of time constraints, the existing curriculum has its pressures, and the food gardens are still not an integral part of the South African curriculum. This calls for the revaluation of the curriculum and its integration with the school food gardens to improve learning in schools.

Regarding learner's concentration, the teachers should identify and deal with the cause of learners' distractions and not assume there will be a lack of concentration when learning in the food garden. Concerning negative perceptions, for example, a study in two Johannesburg schools demonstrated that positive gardening activities reinforce the gaining of knowledge which improved perceptions relating to gardening (Beery et al., 2014). This example is pivotal because it highlights the outcomes of the good practices that should be adopted in various contexts. Overall, there should be a consideration and address of the technical and pedagogical challenges for the school food gardens to be sustainable. Even though these challenges did not affect the main outcome of the study, there are practice recommendations that should be considered in the future.

5.2 Recommendations for Practice

The study proposes practice recommendations that should be considered in future research. The recommendations involve the review of stakeholder collaborations and curriculum development centred on the integration with the school food garden.

In this context, in addition to the existing garden committee, I recommend that different stakeholders collaborate. The additional stakeholders that may be included in the committee would be teachers, learners, community members, government

representatives to assist with the implementation of the existing garden policy and funding and an agriculture expert who will train and mentor all the garden participants regarding how to take care of the garden. All the stakeholders would have shared garden responsibilities which will consist of the maintenance, creating gardening culture and commitment towards teaching and learning as mentioned by the FAO (2010) so that the food garden may be sustained. In the future, the collaborative efforts may overcome the political differences that exist in the school regarding a food garden which may then forge and embrace a healthy working space for all the garden participants. Stakeholders will guide this and have equal inputs about a food garden.

Another recommendation is that there needs to be curriculum development that integrates food gardens as an instruction tool. The curriculum may be developed by the DBE and introduced in schools across the country. This integration may inform the structural changes such as time which is a challenge experienced with the use of a garden. Teachers would first need to be trained so that they are well equipped with skills of effectively utilising the time to engage learners in hands-on gardening activities, as well as implement cross-curriculum teaching. For this reason, learners may be exposed to various learning opportunities that can improve their concentration as they better develop an understanding of concepts. I also recommend that teachers prohibit the use of a food garden as a punishment tool as supported by Teacher A. This will enable learners to garden as valued as learners' negative perceptions change.

5.3 Limitations of the study

Given that the study focuses on only one school food garden, the results should be regarded with caution. Methodologically in this study, unexpected challenges were faced due to time and access. Initially, the interviews were scheduled for after school. However, the teachers did not agree, and they argued that they had to rush home after school. The only option proposed was that the interview be conducted during lunchtime. Unfortunately, with time constraints interviews were rushed through so that all three participants would be interviewed and in the following day the remaining. In case there was enough time, more time, other in-depth details from the participants would have been unearthed and probably the opportunity to interview other teachers. Despite the contributions of the community organisation in the establishment of a food

garden, they were no longer willing to participate in the study due to their ongoing political issues that relate to garden partnerships and who the beneficiaries should be. In future research, learners' input could add value in comprehending how a garden is used and its impact on overall academic performance.

5.4 Conclusion of the study

This study was a case study of a primary school which is located in Orlando West (Soweto) that has a food garden that was investigated. The results of the study were obtained through interviews that were done during the third school term of 2023 and then thematically analysed. Kolb's experiential learning framework along with literature was used to structure the argument. The research aimed to investigate whether the integration of school food gardens provides support towards learning and helps to ensure food security. The aim was to be achieved through 4 objectives firstly, explore the uses of a food garden, secondly investigate the challenges experienced by the existing food garden and its sustainability and lastly, evaluate the impact and contribution of a garden on food security and learning.

Overall, I found that a food garden in the school is used for teaching and learning and supplementing the feeding scheme. These results are similar to the ones that are mostly found in the Global North (FAO, 2004). For instance, Nowatschin, et al. (2017) found that the school food gardens in Canada were used as a teaching and learning tool for curriculum and extracurricular activities. Pedagogically, teachers in this context used the food garden to teach Natural Sciences and Social Sciences. The practice is supported by Wolsey and Lapp (2014) and Blair (2009) who argued that food gardens are commonly used as an instructional tool in science education. Learners are taken to a garden for experiential learning of different concepts by engaging in gardening activities. The practice was found to be useful because learners were able to obtain valuable cognitive and life skills like problem-solving, critical thinking, entrepreneurship, communication, and teamwork which are all important beyond school, despite the challenges that are experienced with a food garden. Beery et al. (2014) reported that learners who engaged in food gardening showed a range of similar practical and life skills. With these results, it is important to note that this research contributes to the limited data available in the global South about school food garden's role in food security and learning.

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Appendices

Appendix A: Wits Ethics Committee Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG | WSoE Wits School of Education

SCHOOL OF EDUCATION ETHICS COMMITTEE

CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: 2023ECE022M**
PROJECT TITLE	Exploring the integration of school food gardens as a learning and food security tool in Primary School, Orlando West, Soweto
INVESTIGATOR	Buthelezi Samukelisiwe Snethemba
SCHOOL/DEPARTMENT OF INVESTIGATOR	Wits School of Education
DATE CONSIDERED	08-May-23
DECISION OF THE COMMITTEE	Approved unconditionally
RISK LEVEL	Minimal risk
EXPIRY DATE :	Date of submission of the Research Report
ISSUE DATE OF CERTIFICATE	19-May-23
CHAIRPERSON	Mbokane Dr Batseba Mofolo-Mbokane

cc: Dr Paul Goldshagg

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

Signature _____ **Date** 25 / May / 2023

Apprendix B: Gauteng Department of Education Research Permission

GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	**31 July 2023**
Validity of Research Approval:	**08 February 2023– 30 September 2023** **2023/283**
Name of Researcher:	**Buthelezi BSS**
Address of Researcher:	**8345 Oak Crescent Street**
	Orlando Gardens/Orlando West
Telephone Number:	**073 390 6016**
Email address:	**samkesnehss@gmail.com**
Research Topic:	**Exploring the integration of school food gardens as a learning and food security tool in Primary School, Orlando West, Soweto**
Name of University:	**Wits**
Type of qualification	**Masters**
Number and type of schools:	**1 Primary School**
District/s/HO	**Johannesburg West**

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

31/07/2023

The following conditions apply to GDE research. The researcher may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

1. *Letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.*
2. *The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.*
3. ***Because of the relaxation of COVID 19 regulations researchers can collect data online, telephonically, physically access schools or may make arrangements for Zoom with the school Principal. Requests for such arrangements should be submitted to the GDE Education Research and Knowledge Management directorate.***
4. ***The Researchers are advised to wear a mask at all times, Social distance at all times, Provide a vaccination certificate or negative COVID-19 test, not older than 72 hours, and Sanitise frequently.***
5. *A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.*
6. *A letter / document that outline the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.*
7. *The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.*
8. *Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.*
9. *Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year.*
10. *Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.*
11. *It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.*
12. *The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.*
13. *The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.*
14. *On completion of the study the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.*
15. *The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.*
16. *Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.*

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

.....

Dr. Gumani Mukatuni
Acting CES: Education Research and Knowledge Management

DATE: 31/07/2003

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

Appendix C: Participants Information Sheet

Participant Information Sheet

24 April 2023

Dear Sir / Madam

My name is Snethemba Buthelezi. I am a Master's in Education student at the University of the Witwatersrand, Johannesburg. My supervisors are Dr P. Goldschagg and Ms T. Chidzungu. I am conducting a research study about a school food garden and its impact in learning and food security. The study title is: "*Exploring the integration of school food gardens as a learning and food security tool in a Primary School in Orlando West, Soweto."*

I am inviting you to take part in an interview. If you decide to take part, your participation in this research study will last about 30 minutes. The interview will take place in person at your workplace after school hours or at a time which is mutually convenient.

With your permission, I would like to audio record the interview and later take pictures of the school garden. This data will be stored in digital form through a password protected computer with all your identifying features removed. Only the researcher and the supervisors will have access to the data.

The interview will be confidential and anonymous. When I share the results of the research study, I will not include your name or anything else that could identify you instead pseudonyms will be used.

If you decide to take part in the research study, it should be because you want to volunteer. You do not have to take part. You can stop being in the study at any time. You do not have to answer any questions if you do not want to. You will not get any direct benefits if you choose to join the research study. You will not lose any services, benefits, or rights you would normally have if you decided not to join. Taking part in the research study will not cost you anything. You will also not be paid for being in this research study.

The risks for this research study are minimal and can be considered no more than what happens in everyday life.

This research study will be written up as a research report. If you would like to receive a summary of this report, I will be happy to send it to you.

If you have any questions during or afterwards about this research study, feel free to contact me or my supervisors on the details listed below. If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za.

Yours sincerely,
Snethemba Buthelezi

Researcher:
Snethemba Buthelezi, 1431451@students.wits,ac.za.

Supervisors:
Dr Paul Goldschagg, paul.goldschagg.wits.ac.za, 011 717 3172
Ms Thandiwe Chidzungu , 1312738@students.wits.ac.za, 011 717 3173

Appendix D: Consent form for interview participants

Consent Form for all the participants

Project name: "*Exploring the integration of school food gardens as a learning and food security tool in a Primary School in Orlando West, Soweto*"
Research conducted by Snethemba Buthelezi

I, …….., agree to participate in this research project.

I agree to the following conditions and activities of the research:

(Please indicate with an X to the relevant options below)

The research study was explained to me. I understand what this study is about.	Yes		No	
I understand that I can volunteer to take part in the study	Yes		No	
I agree that the interview may be audio recorded	Yes		No	
I agree that direct quotations from my interview may be used by the researcher in their research report	Yes		No	
I agree that my participation will remain anonymous (my name will not be used by the researcher in their research report instead pseudonyms will be used)	Yes		No	
I agree that other researchers may use the information I provide in my interview (depending on their own ethics clearance being obtained) but my name and any personal information will not be used or passed on	Yes		No	

……..…… signature

……..…… name of participant

……..…… date

……..…… signature

……..…… name of researcher

……..…… date

Appendix E: Interview schedules

Interview schedule for the principal

The interview will take 30 minutes or less

1. What role does the existing school food garden play?
2. What values does the food garden try to instil?
3. Who handles the maintenance of the school food garden?
4. Who are the stakeholders involved in the school food gardens and what contributions do they make?
5. Have the stakeholders received any form of gardening training?
6. Has there been funding for sustaining the school gardening? If yes, please elaborate on how it has been helpful/ if no, how will be helpful?
7. For what is the food harvested in the garden used?
8. What are your views on the food gardens potential in bridging the gap of food security?
9. What has been the benefits of having a school food garden?
10. What are the challenges that you have experienced in the school food garden?

Interview schedule for the teachers

The interview will take 30 minutes or less

1. How long have you been in the school?
2. Do you have any experience using the school food garden for any purpose? If yes, what kind?
3. Have you or intended to incorporate the school gardening activities as part of teaching and learning formal and informal activities in social sciences/ natural sciences/ life skills or orientation?
4. What are your views in the use of the school garden for learning and understanding social sciences/ natural sciences/ life skills?
5. How have you previously used the garden to teach? If yes, what was it used?
6. Do you think there is anything different and authentic that the school garden offers which is not already offered in the everyday classroom?

7. What skills do you think learners can be equipped with when learning in the school garden?
8. What do you think can be/ are challenges for integrating the school food garden for learning?