Educators' Reflections on their Practices of Agricultural Sciences Curriculum and Assessment Policy Statement

By

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at the

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Declaration

I, **Msimelelo Buyisile Nkohla**, declare that the dissertation entitled "**Educators' reflections on their practices of Agricultural Sciences Curriculum and Assessment Policy Statement**" is my own work and all the sources that I have used or quoted have been indicated and acknowledged. This dissertation does not contain other persons' data, picture, graphs and/or other information, unless specifically acknowledged as being sourced from other persons.

This dissertation has not been previously submitted or accepted for any degree or examination at any other university.

Signature: ………………………….   Date: …………………………..

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As the Candidate's supervisor, **I agree / disagree** to the submission of this Dissertation

Signature: …………………………..   Date: ………………………………

Dr. Simon Bheki Khoza

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Above all, God Almighty for giving me strength and courage to start and complete this research

Dedication

This study is dedicated to my Mother, Nocawa Patricia Nkohla, for her love, support and encouragement. She is one person who keeps me moving forward. I also dedicate this work to my Son, Ayolile Buncwane, for his unconditional love, and to my only brother, Lisolethu Nkohla.

Abstract

The aim of this action research was to explore the reflections of four educators on their practices of Agricultural Sciences Curriculum and Assessment Policy Statement (CAPS) in rural schools of KwaZulu-Natal. The research also meant to answer the following research questions: the first question was framed to discover what educators' reflected on their implementation of Agricultural Sciences CAPS; the second research question was based on what enlightens educators' reflections to be the way they are about execution of their duties; and the last quested intended to discover what lessons could be learned from the educators' reflections on their teaching practices. Data were generated through a reflective activity, one-on-one semi-structured interviews, and a focus group discussion. Purposive and convenience samplings were utilised in grouping the educators for easy accessibility. Data were analysed using guided analysis. Literature proposed psyche, pragmatic and performance as archetypes of reflection, and findings from this study indicated that educators were mostly influenced by personal and societal rationale in teaching Agricultural Sciences CAPS. Findings of the study also revealed that educators are not aware of all the factors that underpin their teaching practices, and unequal acknowledgement of the curricular archetypes may result in disparities between intended, implemented and attained curriculum. According to the findings, the subject aims emphasise practical skills but the actual content is theoretical due to a lack of resources. Remoteness and accessibility according to the findings hinder efficient and effective implementation of the intended curriculum. However, educators improved their teaching after reflecting on their practices. It is recommended that educators should reflect on their practices and understand all theories that underpin their teaching practices in order for them to attain better outcome and attain curriculum goals. Lastly, educators should be involved in the reviewing of CAPS because they are the primary implementers of any curriculum.

Keywords: Educators' reflections, teaching practices, CAPS, Agricultural Sciences, Curriculum

Table of Contents

List of Figures

List of Tables

CHAPTER 1

The synopsis, context and objectives

Candidate Statement

I conducted this study because I feel a string need to make a difference. I need to make a difference by understanding my own personal identity/needs together with that of learners (psyche reflection), societal identity/needs (pragmatic reflection), and Agricultural Sciences identity/needs (performance reflection). In my journey of trying to understand my own personal identity/needs, I completed a Bachelor degree (BSc) and Master degree (MSc) in Agricultural Science. This provided me with adequate theories and practices of Agricultural Sciences that I use in my real life situation to make decisions. Furthermore to my qualifications, I worked with different societies where I observed that I needed a teaching qualification in order to better understand curriculum theories. Curriculum theories were important for me because they helped me with planning, implementing, and evaluating different Agricultural Sciences activities (personal, societal and professional activities). In my journey of enquiring the curriculum theories I completed a Post-Graduate Certificate in Education (PGCE). I realised that PGCE was not enough for me to work with different communities/societies of educators, learners, and parents; I decided to conduct this study for a specific Master's degree in Curriculum Studies to complement my MSc in Agricultural Science. I have also published articles on Agricultural Science issues in different journals. My next intention is to help my country to stabilise food security and to develop Agricultural Sciences Curriculum through this MEd dissertation/thesis together with published journal articles. Over and above these activities I am planning to study towards a PhD in Agricultural Sciences Curriculum with an aim of producing a new Agricultural Sciences Curriculum theory that may address my personal needs (knowledge generation), societal needs (knowledgeable society and food secure livelihood) and Agricultural Science needs (to develop resources for economic development). Therefore, this study transformed my knowledge of Agricultural Sciences Curriculum to understand the different needs of learners, societies and Agricultural Sciences profession. These were facilitated though the educators' reflections on their Agricultural Sciences practices of curriculum visions, goals, content, activities, resources, environment, time, assessment, educator role and grouping/accessibility. These factors need to be equally recognised in order for any curriculum to be successful and

significant, if not, the curriculum may collapse. Thus, this long and lonely journey has made me understand that a well balanced curriculum should address individual/personal needs, societal needs, and subject/professional needs.

1.1 Introduction

Curriculum implementation has been a major aspect of South Africa's education reform discussions since our transformation to a democratic government in 1994 (Khoza, 2015c, 2015d). The discussions have been endorsed by the number of changes of curricular in the country since 1997, after the first curriculum review to instate a policy which will counteract the inhumane principles of apartheid era (Bantwini, 2010). Hoadley and Jansen (2013) define curriculum as a plan of teaching and learning to attain learning outcomes. How it is put into practice is affected by a number of factors, which will be discussed in details in this study. Thus, due to challenges in implementation, Motshekga (2011) asserts that the first curriculum in the democratic South Africa, Curriculum 2005 (C2005), was preceded by the Revised National Curriculum Statement (RNCS) and National Curriculum Statement (NCS), which were also reviewed and replaced by the current Curriculum and Assessment Policy Statement (CAPS). Curriculum is designed at a national (MACRO) level and its maximum implementation/enactment processes take place at classroom (MICRO) level (Carl, 2012). Thus, this study intends to explore educators' reflections on their practices of implementing/enacting the Agricultural Sciences Curriculum (CAPS).

Furthermore, through these reflections, educators' practices/experiences will be understood and also what influence how they execute their duties. This study also intends to reveal the lessons that can be learnt from Agricultural Sciences CAPS educators' experiences in order to transform and improve how the curriculum planned at macro level is implemented at micro level. Lastly, in this chapter, the focus of the study, the rationale, literature review summary, methodology, limitations, delimitations and ethical issues will be presented.

1.2 Title

Educators' reflections on their practices of Agricultural Sciences Curriculum and Assessment Policy Statement

1.3 Focus and Purpose of the study

The purpose of this study is to explore educators' reflections on their practices of implementing Agricultural Sciences CAPS.

1.4 Location of study (delimitation)

The study was conducted in three rural high schools offering Agricultural Sciences from Grade 10-12 at Lebombo cluster under Ingwavuma circuit in the Umkhanyakude district of KwaZulu-Natal. The schools were as follows: School 1 = S1 with one educator (P1); school 2 = S2 with two educators (P2 and P3); and School 3 = S3 with one educator (P4). These schools are located in a rural area where the socio-economic status is low due to the high unemployment rate, a high incidence of poverty, and drugs and substance use. The study focused on educators' reflections on how they implement/enact the Agricultural Sciences Curriculum (CAPS) from Grade 10-12.

1.5 Rationale of the study

The study was preferred because of my personal interests in teaching Agricultural Sciences. Also my experience/s during my postgraduate (Masters) studies in Agricultural Sciences ignited the urge to embark on this journey (study). I started teaching Agricultural Sciences, at high school level, in 2014, as a student teacher. However, I have also taught agricultural sciences courses, as a time-on-task lecturer and tutor, at the University of Fort Hare from 2011 to 2013. I have worked with the Agricultural and Rural Development Research Institute (ARDRI), Institute for Cooperatives Development, and Heifer International South Africa, where I assessed and monitored projects (assisted by the government) and noticed the scant involvement of youth in several innovative initiatives. That troubled me because it poses a huge challenge as agriculture is one of the core areas sustaining human livelihood through food security, especially in rural areas. It came to my attention that learners/ students lack motivation at school level and even educator's effectiveness in educating the subject concerned me. I also observed a lack of foundation and poor pass rate amongst students. Furthermore, at secondary level, educators don't seem to be following CAPS very well, and this leads to a poor pass rate in Agricultural Sciences. Educators state that they have not

changed their teaching styles and activities, regardless of the curriculum change over the past few years. Hence, I felt the need to conduct this study in order to explore educators' reflections on their practices of the new South Africa Agricultural Sciences Curriculum (CAPS). Their reflections might serve to assist curriculum designers, policy makers, circuit management, educators, subject specialists and advisors to address the problems of bridging the gap between planned, implemented/enacted and attained curriculum.

Ever since South Africa became a democratic country during the post-apartheid regime, curriculum change has been one of the major features of teaching and learning in the country (Carl, 2005). Curriculum is defined by Walsh (2015) as an interdisciplinary foundation on which provision, assessment, and evaluation of education is based. It has been changing continuously to address the education system which was characterised by marginalisation, racism, sexism and inequalities. However, its implementation has also erupted enormous controversy due to the belief that more attention had been focused on the educational change and desired outcomes than on how it should really be put into practice (Bantwini, 2009), and the rationale for its implementation/enactment (Khoza, 2015a). Moreover, implementation of any curriculum needs critical reflections on both intended (planned) and attained (learned) curriculum so that educators become aware of the archetypes (goals, resources, environment, activities, environment, educator role, assessment, rationale, time and content) that frame any curriculum (Khoza, 2015c). Teaching the new South African Curriculum and Assessment Policy Statement (CAPS) can be a strenuous and overwhelming exercise coupled by complexity of hierarchy in all levels of education that demands educators' understanding of teaching/ curriculum concepts (Czerniewincz & Brown, 2014). Moreover, schools are complex, and a failure to acknowledge their complexity, by understanding and applying the curriculum concepts, is one of the major reasons for the predicable failures of educational reform. Amongst other reasons, low consideration of educators' voices in curriculum contributes significantly to the failure (Carl, 2005). With inadequate tools, educators are expected to reach a miracle on unattainable goals (King-McKenzi, Bantwini, & Bogan, 2013).

Furthermore, Khoza (2015c) asserts that educators' reflections are fundamental in education, as self, written and verbal reflections promote critical thinking and problem solving

capabilities. If educators' reflections on the curriculum practices based on curriculum concepts could be known and understood, it might be much better to implement the new South African curriculum (CAPS). Thus, educators should not only be involved in continuously facilitating and implementing the education reform that was/is designed without their involvement (Swanepoel, 2008). In addition to the latter, technology integration in teaching and learning seems to be increasing (Khoza, 2015d), mainly in urban areas or in schools that are not regarded as "needy/poor" or "disadvantaged". So, indeed, it is clear that rural schools continue to suffer due to lack of efficient learning conditions compared with their urban counterparts (Czerniewincz & Brown, 2014). Furthermore, Czerniewincz and Brown (2014) indicate that there is no proper infrastructure in some rural schools and this is coupled by limited textbooks and poorly trained educators.

1.6 Literature Review

A study conducted by Nakabugo and Sieborger (2001), which focused on curriculum reform and teaching in South Africa, revealed that there are a lot of discrepancies between planned curriculum and implemented curriculum. The lack of understanding of curriculum visions and goals (aims/objectives and learning outcomes) is still continuing to be a worldwide challenge that needs to be critically dealt with in order to promote good quality teaching and learning (Khoza, 2015c). The challenge seems to be denied by most curriculum implementers (educators), as a result they continue implementing/enacting the curriculum without a proper understanding of the visions and goals (Berkvens, Van den Akker, & Brugman, 2014). However, the above-mentioned challenge is not the only issue in education. This is affirmed in a qualitative study that was conducted by Boone, Boone, and Hughes (2006) which focused on agricultural sciences educators' attitudes, knowledge and understanding of Biotechnology. The study revealed that, sometimes educators' subject content knowledgeableness hinders their practice in classroom. This further inculcates a negative attitude towards the subject which gets in the way of the educators ability to perform their role to their maximum level possible level.

Additionally, Thobega, Subair, Mabusa, and Rammolao (2011) (who focused on curriculum related factors that affect agriculture educators' delivery of subject matter) together with Waithera (2013) (who worked on challenges to teaching and learning of agriculture curriculum) reveal that inadequacy of teaching-learning resources which limit learning

activities, and the area (rural) where some schools are located hinder accessing resource centres, like libraries which are in urban areas. As a result it takes time to transfer knowledge to learners in order to induce understanding and critical thinking skills. Thus, Van den Akker *et al.* (2009) developed the curriculum spider-web with ten archetypes/concepts to model (frame) our analysis of a curriculum (Rationale, accessibility, goals, content, activities, teacher role, resources, environment, time and assessment). These archetypes allow educators to reflect on their practices of curriculum implementation/enactment, and should be equally addressed in order for the implementation/enactment process to be effective.

1.7 Objectives of the study

The objectives of this study are:

A. To identify educators' reflections of implementation of the current South African Agricultural Sciences Curriculum (CAPS);

B. To understand what enlightens educators' reflections on the execution of their duties;

C. To explain the lessons that can be learnt with educators' practices in implementing Agricultural Sciences Curriculum (CAPS).

1.8 Research Questions

A. What are educators' reflections on their implementation of the new South African Agricultural Sciences Curriculum (CAPS)?

B. What informs educators' reflections to be the way they are, about executing their duties?

C. What lessons can be learnt with educators' reflections in implementing and enacting Agricultural Sciences Curriculum (CAPS)?

1.9 Research Design and Methodology

1.9.1   Research Paradigm

According to Krauss (2005), the critical paradigm deals with the knowledge of reality as a result of social conditioning and it cannot be well recognised without the involvement of the social actors and implementers. Therefore, it is the educators' understanding of their own implementation that determines the success of learning, and failure to recognise their

reflections on their practices of Agricultural Sciences Curriculum (CAPS) may lead curriculum failure. Hence I decided to choose the critical paradigm, as its focal point is to bring transformation in society (Cohen, Manion, & Morrison, 2011; Khoza, 2015b). Educators' voices are not loud enough to be heard by those who are in corridors of power and decide what's to be done, and how it should be done. Therefore, choosing a critical paradigm for this research explored how educators feel about their day-to-day practices. However, this paradigm needed me to first understand the social, economic, political, cultural, gender, and ethnic issues to incorporate altruistic values and empowerment in educators' day-to-day work. This includes how they experience the feasibility of instructions they are given to perform their duties/tasks. Furthermore, the curricular archetypes (concepts), to assist their teaching-learning processes, were brought forward, as they have little or no influence in curriculum planning and development, mainly because of their ranks or post level. Hence the purpose of this study was to explore educators' reflections on their practices of implementing and enacting the current Agricultural Sciences Curriculum (CAPS) at secondary level.

However, socio-economic and political domination constrain participants to fully reflect and express themselves, as they may be uncertain about the level of privacy and confidentiality of the research. This could then result in hiding some important information due to fear of alienation and further domination by existing structures of power, such as policy makers (B. Bogdan & Biklen, 2002).

1.9.2   Research approach/style

Comparable data were gathered using a qualitative method in order to determine the feasibility of implementing/enacting the new Agricultural Sciences Curriculum (CAPS) in selected secondary schools. A qualitative approach allowed the participants to put their views in plain words and express themselves about the subject matter. Krauss (2005) asserts that, due to the fact that it is a form of social inquiry, it shows how people interpret and make sense of everything they experience on their day-to-day life. A qualitative approach provides more precise reflections directly from the affected individuals. A profound insight, about their cries and experiences is revealed. This brings an understanding on the social reality of the individuals affected, through behaviour and feelings of people who are directly affected

(Atkinston, Coffey, & Delamont, 2001; Babbie, 1993; Khoza, 2015c). Moreover, "The way educators perceive their work has been a crucial question in education" (Khoza, 2015b, p. 2).

Qualitative methods of research, such as unstructured or semi-structured in-depth interviews and case studies are appropriate in the critical paradigm (Krauss, 2005). This method is constructive to explore transformation or conflict, as its basis lies in interpreting and describing the lived experience of educators. It helps us to understand the societal aspects in our, in this case teachers, everyday lives. Our interaction with society is directly influenced by the stimuli that society has on us. The stimuli and social events determine our attitudes, values and culture differences amongst social groups. Qualitative research will then answer questions about why and how individuals feel about the experiences they are subjected to (Khoza, 2015c) and active participants in. The data were used to conceptualise and understand the social world of agricultural sciences educators and for them to do self introspection in order to improve their teaching methods.

The study would not have been very significant and clear in meeting its aims if I had not combined the critical paradigm with an action research methodology. However, action research has been reported by Khoza (2015b), that it cannot be used to generalise, since it gives conclusions based on a certain group of people who participated in a particular study, and it is not done in controlled environments. Thus, it does not signify conclusions of the entire population. Despite that shortfall, its natural and practical state endorses an in-depth description of the phenomenon, exploratory and critical thinking.

1.9.3 Sampling

Sampling is described by Babbie (1998) as the selection of a suitable sample for a study. These can include items selected at random from a population and used to test hypothesis about the population. There are an enormous number of factors, such as time, finances, accessibility, and secrecy, which prevent efficiency of/in a study. Therefore, to minimise those constraints, I chose a small group for information gathering. I used four educators as participants, (S1, S2A, S2B and S3), whom served in the same schooling cluster (Lebombo).

So, the target population for the study was the Agricultural Sciences educators in FET senior phase (Grade 10-12), at Lebombo cluster of the Ingwavuma circuit in Umkhanyakude district (KwaZulu Natal). All the selected schools (S1, S2, and S3) were located in the same area so visiting them would not be a problem since all the participants attend the same cluster and workshop meetings together. For this reasons, purposive and convenience sampling was also chosen as the research methodology for this study. Purposive sampling was best for this qualitative sampling and this is affirmed by Palys (2008, p. 698) by asserting that "purposive sampling is virtually synonymous with qualitative research". Each school had two Agricultural Sciences educators, except for school S3.

1.10   Data Generation Methods

Data for this study were generated using three methods: 1. Educator's reflections through open-ended questionnaire; 2. One-on-one semi structured interviews; and 3. Semi-structured focus group discussion.

1.10.1 Reflective Activity (Open-ended questionnaire)

Educators reflected through a series of open-ended questions as an activity to voice out their perception about the Agricultural Sciences Curriculum (CAPS) implementation. Reflective activities are common in social research and they allow participants to be explorative and comfortable (Babbie, 1993, 1998; Bernard, 1994). The reflective activity (open-ended questionnaire) paved the way as a foundation for the focus group discussions. Furthermore, adequate time was given to all the participants to complete the questionnaires. Before the questionnaires were issued, they were carefully revised for accuracy. However, participants sometimes become hesitant to disclose everything due to personal and confidential issues. After evaluating the questionnaire, we all engaged in a focus group discussion.

1.10.2 Focus group discussions

For participants to interact with each other and the researcher as the mediator, a focus group discussion (interview) is vital (Mpungose, 2016). This allows participants to intensively

debate and come with idealistic suggestions which are of high moral or intellectual value to remedy the problems of Agricultural Sciences Curriculum implementation (Cohen et al., 2011). To effortlessly access and travel between schools, a focus group discussion was held at one school central to the participant. Reflections on the implementation of the new Agricultural Sciences Curriculum (CAPS) were in a form of a discussion and dialogues. As the principal mediator, the researcher had to make sure that everyone had equal chances to participate without discrimination based on sex/gender, age, race, tribe, and otherwise. Everyone's view was recognised uniformly. Equal participation was assured by facilitating one semi-structured focus group interview using the same set of questions from a questionnaire, to avoid dominance by certain participants. This took about an hour. All participants were post level (PL) 1 educators to avoid feelings of rank superiority and inferiority within the group.

1.10.3 One-on-one (individual) semi-structured interviews

Semi-structured interviews have been reported by Bernard (1994) to be the most useful type of interview in qualitative research. Using this method of data generation allowed me, as the principal researcher, to get specific information, to compare and contrast the information from the open-ended questionnaires (reflect activity) and the focus group discussions (interviews). Generating data by using different sources/methods enhances authenticity which in turn enhances and helps to achieve measures of trustworthiness (Khoza, 2015c). During the interview, the same set of questions was asked individually to all interviewees, to maintain uniformity and precision of the results. However, had to remain as adaptable as possible to accommodate other important information that might arise and which would require elaboration (Gillies & Boyle, 2010).

The interviews were conducted for about 30 to 40 minutes per session. A tape recorder was also used for a later transcription to check accuracy. Khoza (2015c) also indicates that audio-taping verifies that triangulations, transferability, dependability, conformability and curricular spider web credibility are supported. This would also ensure long-term reliability and legitimacy of the findings.

1.11   Data analysis

Modification, through data interaction, of themes and categories that materialize from the data generation procedures used in this study were analysed using guided analysis. Even Khoza (2015c) on a study entitled *"Student teachers' reflections on their practices of Curriculum and Assessment Policy Statement",* points out that for a study which is exploratory in nature, guided analysis is appropriate to be used for semi-structured interviews, focus group discussions and project analysis comments. Guided analysis includes both inductive and deductive reasoning processes. Inductive reasoning was enhanced by emerging categories from the data, while mapping sets of categories onto the data enhanced deductive reasoning. The focus of the study, which was to explore educators' reflections on their practices of Agricultural Sciences Curriculum (CAPS), was revealed by open-coding the participants' responses and analysing the data using guided analysis.

1.12   Ethical considerations

Many professional studies carried out throughout the world have an obligation of adhering to firm ethical principles. This study is no exception to that. Bernard (1994) defines ethics as the principles of right and wrong that are accepted by an individual or a social group. Henning (2004) further states that ethics is a system of principles governing morality and acceptable conduct. As a researcher, I needed to be very sensitive about the morals and rights of others, while human dignity was respected and embraced. The rights of others need not to be violated in any manner. Furthermore, on my previous research on livestock animals, I learned that their welfare needs to be taken with vigilant caution as well. Christiansen, Bertram, and Land (2010) also assert that in research, ethics is critical, especially in human and animal research programmes where the rights are protected from harm and discomfort. So, this study was aligned along the ethical conducts employed in any study of this nature. All aspects of ethical conduct, such as informed consent, sovereignty, impartiality or justice, social value, legitimacy and even-handedness, were taken with great respect.

The first activity undertaken was to verbally request the targeted individuals become participants, this was followed though informed consent forms which explained the process. I then consulted the institute/school heads (principals) in Ingwavuma Area, Lebombo circuit of

the Umkhanyakude district to seek permission, to have the respective educators interviewed for this research. After permission was granted, the Department of Education circuit office was consulted for approval. Before the interviews started, the purpose of the study was explained to the participants, and letters of informed consent were issued for their signatures. It was ensured that all participants understood that their rights, to confidentiality and anonymity of their voluntary participation in this research, were taken with maximum precautions. If at any given time they felt some discomfort of emotional distress, they were free to discontinue with the interview. Pseudonyms were used instead of their real names, for the sake of their rights to privacy. They were asked to sign, as a confirmation that they understood all the terms and conditions of the interviews and agree to participate.

1.13   Trustworthiness

The rigorousness of this study was greatly dependant on the trustworthiness of the research design and the research itself. This ensures that data is legitimate and authentic and endorses the quality and significance of the study (Henning, 2004). All instruments and methods used allowed the principal researcher to meet this study's purpose, which was to explore educators' reflections on their practices of the new Agricultural Sciences Curriculum (CAPS). Results from this study are beneficial even to other educators not involved in the study, subject advisors (assessors), curriculum planners and developers. In other words, findings from this study can benefit the whole education fraternity to bring transformation in educators' day-to-day lives. Trustworthiness includes the extent of consistency of results over time. Hence, I strongly believed that results from this research should be considered significant if ever they could be reproduced under a similar methodology.

To make my findings more truthful, consistent, credible, transferable, conformable, and dependable, I engaged the unwritten (verbal) accounts of the respondents in a process that was more reflective during the analysis procedure. This prevented biasness and brought findings that maintained an obligatory neutral state. Furthermore, an audio tape recorder was used during interviews, to ensure accuracy during the transcription process. Uniformity was maintained in the questionnaire by asking the same interview questions to all the participants.

1.14   Anticipated problems/limitation

Ideally, a study of this nature is supposed to incorporate a wider range of schools within the Umkhanyakude district, but due to time constraints and monetary restrictions, only five educators, in three schools were accessible. The results and findings from this study are subjective, personal and contextual due to its small scale. Therefore, findings from this study can be used for the sake of transferability rather than generalisation. During data generation, I had to be very careful with regards to biasness and the unintentional influence of my own personal interests. Thus, the interviews had to be informal and allowing participants to tell me about their teaching experiences in no particle order. This enhanced the subconscious mind to partake in the reflection process without any reservations.

1.15   Chapter overview

1.5.1 Chapter 1

This chapter reveals the overview synopsis, context and objectives of the study. Research questions, as they are directly linked to the objectives, are clearly stated. This chapter also provides the reader with information to know and understand the significance of conducting this empirical research and how it will benefit the field studied. The research design and methodology are clearly elucidated in this chapter.

1.5.2 Chapter 2

In this chapter, the researcher engages in a discourse with what other researchers have written/reported/asserted on the same area. In this chapter, the phenomenon (educators' reflections), two prepositions (curriculum enactment and curriculum implementation), curriculum development approaches (instrumental, communicative, artistic, and pragmatic) and archetypical model (conceptual framework) are discussed.

1.5.3 Chapter 3

This chapter unpacks the methodology adopted by this study in order to answer the research questions and achieve the research objectives. The chapter outlines that this research has adopted a critical paradigm and is an action research study. It also reveals that four

participants have been selected for the study. For data generation methods, it indicates that reflective activities, one-on-one semi-structured interviews, and a focus group discussion have been used. This chapter also describes the convenience and purposive sampling, and inductive and deductive reasoning (guided analysis) methodologies that are used in this study. Trustworthiness is also described in this chapter.

1.5.4 Chapter 4

This chapter presents data analyses and discussions of findings. The data is presented using the curricular archetypes as the themes to categorise educators' reflections which are based on psyche, pragmatic, and performance levels. In presenting the data, the study would ensure that the voices of the participants are not lost.

1.5.5 Chapter 5

This chapter summarises the findings from the previous chapters as based on the purpose of the study. The findings summary is also aligned with research questions that are used to achieve the study purpose. Suggestions for further research and recommendations are presented in this chapter.

CHAPTER 2

<u>Literature review</u>

2.1 Introduction

This chapter begins by elaborating on the contextual meaning of reflection, as the research phenomenon, based on what Agricultural Sciences educators feel about their experiences on the work they are doing. The fact that educators are the central drivers (enactors and implementers) of any school curriculum reform indicates that their reflections should be aligned to what Khoza (2015d) refers to as the ten curriculum concept or teaching/learning signals, which can also be called curricular archetypes. Their experiences are entrenched on two prepositions, namely curriculum implementation and enactment. This literature review chapter will then evaluate reports of different studies related to the nature of the current study and its objectives. Levy and Ellis (2006) indicate that for any academic research, literature reviewing is critical as it uncovers what is already known and reported by other researchers on the topic of interest. Literature review is defined as the study of collected works of multiple research manuscripts (Boote & Beile, 2005).

Furthermore, political, economic, and social changes have distorted the traditional view of educators as the primary holders of power in classrooms and schools in general. That traditional view made ways for a reciprocal power relationship with learners, in which both learners and educators are in control of the teaching-learning environment (Cothran & Ennis, 1997). Therefore, this chapter aims to evaluate reports of studies in the literature related to educators' reflections on their practices of Agricultural Sciences Curriculum and Assessment Policy Statement. Thus, this chapter intends to describe, summarise, evaluate and clarify these reports, not only those based on the South African context but also international contexts in order to reveal how curriculum is managed in other countries as well. The phenomenon (educators' reflections), prepositions (implementation and enactment), conceptual model and curricular archetypes will be presented in this literature review chapter. Furthermore, this chapter also intends to answer the following questions: 1) What are educators' reflections on their practices (implementation and enactment) of the new South African Agricultural Sciences Curriculum (CAPS)?; 2) what informs educators' reflections to be the way they are about executing their duties?; and 3) what lessons can be learnt with

educators' reflections in implementing and enacting Agricultural Sciences CAPS. These questions are aligned with the study's objectives and will be addressed as based on the curricular archetypes (curriculum concepts) that form the basis of educators' reflections.

The model for this chapter is represented by the fruit tree model diagram shown by figure 2.1 below:
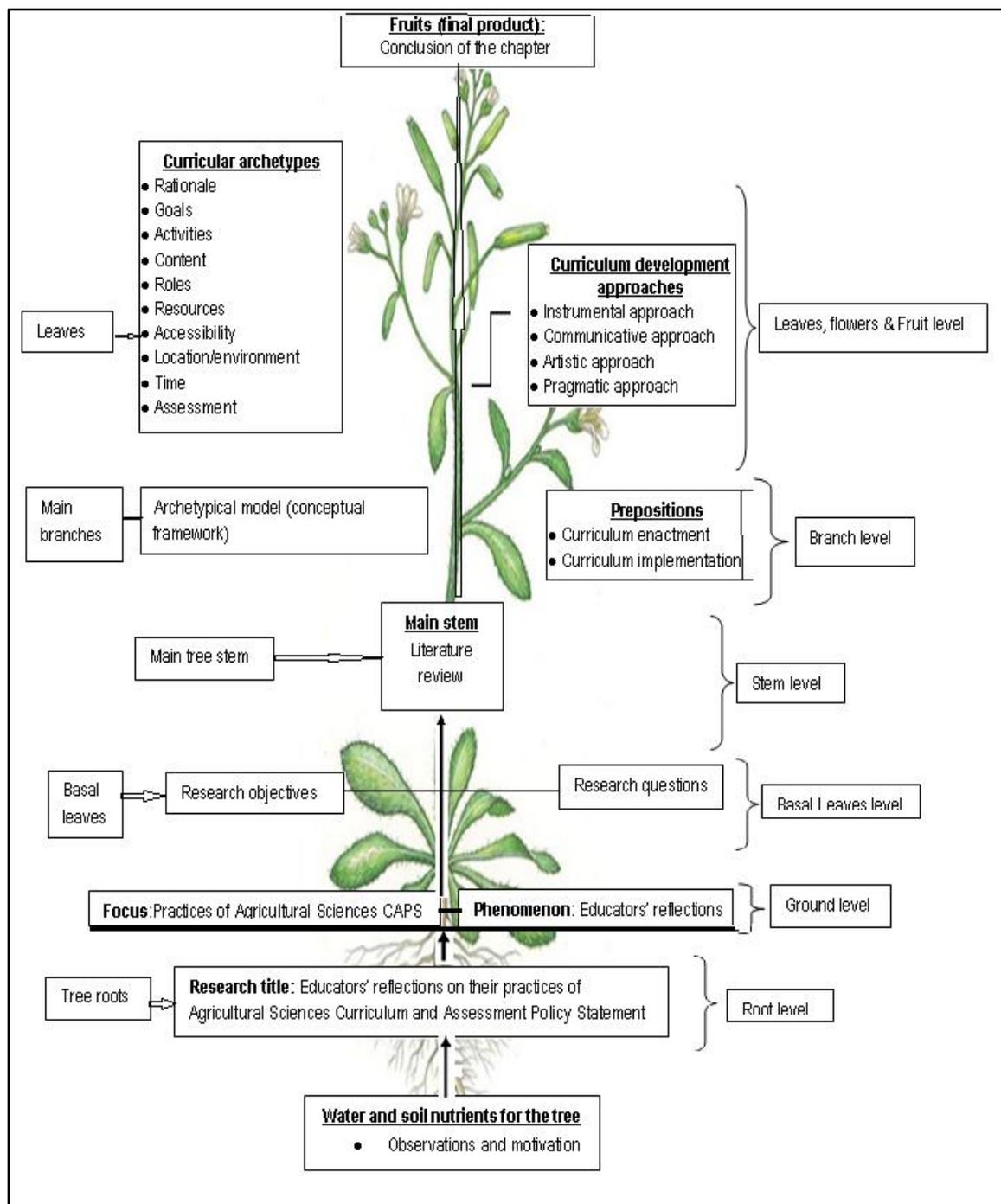
Figure 2.1: Chapter 2 fruit tree model diagram

2.2 Phenomenon (Educators' reflections)

The heart of any educational reform is educators, and their reflections on their experiences/practices of implementation and enactment of the reforms which are key to meeting the curriculum goals (Askell-Williams & Murray-Harvey, 2013; Khoza, 2015c). Çimer, Çimer, and Vekli (2013, p. 133) undoubtedly indicate that "reflections involve the participant in a critique for practice, the values which are implicit in that place, the personal, social, institutional and broad policy context in which practice takes place, and the implications of these for improvement of that practice". Furthermore, reflections and reflective activities are reported by Mann, Gordon, and MacLeod (2009) to be essential for professional competence. With curriculum implementation/enactment, educators' reflections help to keep track of how educators execute their duties. This also promotes self-introspection for educators to revive their enthusiasm towards teaching and learning (Wan, Howard, & Alan, 2010). Educators' roles to implement the curriculum are compromised by the ever changing policies, and this hinders their effectiveness to execute their duties. In addition, failure to allow educators to reflect on their practices may yield poor outcomes (Askell-Williams & Murray-Harvey, 2013).

Moreover, educators' reflections of teaching and learning are also changing as curriculum develops, to be more active and practical than passive and instructional (Çimer et al., 2013). Teaching and learning is increasingly viewed as a personal and complex process where there is an active building of knowledge from practices/experiences, and actions and interactions with the outside world. This suggests that, the view of teaching and learning in terms of passive assimilation of knowledge/information is eradicated (Çimer et al., 2013; Mann et al., 2009; Mpungose, 2016; Ndwandwe & Dlamini, 2013; Waithera, 2013). Hence reflective practice is seen by Ferraro (2000) as a critical process in enlightening one's artistry in a particular discipline. Ferraro (2000) further expands by mentioning that reflections start when people inquire into their experiences/practices and awareness to discover sense in their philosophy. In this sense, reflection shares resemblance with our consciousness of critical thinking (Mann et al., 2009). This suggests that educators should be given an opportunity to reflect on their practices of implementation/enactment of the intended curriculum. This significantly allows educators to understand the curriculum vision in order to achieve curriculum goals (Khoza, 2015c).

Furthermore, the importance of educators' reflections became evident in a case study conducted by Khoza (2015c) on twenty-two postgraduate university students who specialised in curriculum studies. For data generation, the students' project analysis, one-on-one semi-structured interviews and focus group discussion were used. In selecting the most accessible twenty-two students, purposive and convenience samplings were used. The study revealed that most student educators did not have much awareness of some principles that strengthens their subjects CAPS. Due to the less awareness of the principles that shape their learning, they continued to educate their learners the way they had been working throughout their years of being educators. CAPS has a hierarchy of steps to implement and attain the intended curriculum (Khoza, 2015d), but Khoza (2015c) reported that the twenty-two educators did not prioritise on subscribing to CAPS when implementing their subjects. Khoza (2015c) identifies reflection as an important principle in education, as it allows one to take a thorough analysis on his own ideology and use of the soft-ware and hard-ware resources in education. Furthermore, Khoza (2015d) stresses that for proper implementation of CAPS, principles to be considered include educators using their conscious mind in teaching in order to be aware of their actions, and by all means they should avoid using their subconscious thoughts which are behaviours created without thinking. He further asserts that, the use of conscious mind may promote critical reflections that primarily answer questions of 'what', 'how', and 'why' within one's teaching-learning practice.

Moreover, looking at Khoza's studies (Khoza, 2012, 2013b, 2014a, 2014b, 2015a, 2015b, 2015c, 2015d), the principle of expressing careful consideration on the teaching/learning signals (rationale, goals, content, accessibility, teaching/learning activities, teacher role, resources, environment, time and assessment) discovered by Van den Akker et al. (2009), is crucial for transforming education reform and teaching-learning processes. This suggests that agricultural sciences educators should identify the principles/theories that underpin their subjects in order to understand and master the implementation process to attain the intended curriculum goals. Unfortunately, the CAPS document does not specify that educators should reflect. The principles are not vocal about reflecting educators. Thus, educators' voices never reach the ears of those who develop curriculum, the policy makers.

In addition to the above, Dewey (1933) concurs with the assertion that reflections are central in transforming practices, and in any successful reflection on curriculum, personal, social,

and political elements are significant in making your own meaning of reflective practice (Kehdinga, 2014a, 2014b). Dewey, as an American pragmatist, places a strong principle of human faculties of habit, practice/experience, and emotions in reflections. Dewey views the primacy of reflections based, on habits and experiences, as core fundamentals to successfully strengthen emotions and cognition (Dewey, 1933). A similar study on reflections was conducted by Pedro (2005) on five pre-service educators who put together their own senses on the significance of reflective practices in their teaching-learning. The study reveals that self-reflections, verbal reflections and written reflections promote critical thinking and educators should be given a chance to reflect on their practices. As an educator, being conscious about your practice/s improves your cognitive level and allows you to develop your own effective ideologies and approaches for teaching-learning (Khoza, 2012). Thus, I state that CAPS does not produce enough support for the educators to reflect on their practices. Furthermore, this suggests that, in order for educators to identify and understand the problems affecting their practices, they should critically reflect and involve themselves in self-introspection. This can then strengthen the relationships between agricultural sciences educators and other educators, as well as with learners/students.

Moreover, another study by Khoza (2015b) which represents a qualitative critical action research on six Grade 12 high school educators who used *Turnitin* as part of their assessment process, reveals the significance on educators' reflections in formulating ideologies to facilitate teaching and learning processes. The study explored educators' reflections on *Turnitin* used in assessing their learners' work at a school in Durban. The ideologies encompass personal reasoning and justification for the employed approaches educators use, with all the teaching-learning activities in the process. Khoza (2015b) asserts that, if educators have facts about their practices, they tend to have content reasoning, but if they have opinions about their practices, they tend to have societal reasons for teaching the way they teach, and for using the approaches they use. These assertions are also in line with the one by Yang (2009) that reflections promote critical thinking, and without proper reflections, transformation will be scant. Thus, there is always room for improvements in any teaching practice, regardless of how perfect and justifiable the educator's approach (Mpungose, 2016).

Milliken and Barnes (2002) conducted a study on students' perceptions and personal reflections on teaching and technology in higher education. The study focused on the implementation of a technologically rich approach to introducing the principles of business marketing to 484 undergraduate students. A questionnaire was used for data generation. The study revealed that there is a growing overuse of lecture method or teacher-centred approach as the exclusive means of content delivery. It also reported that in the education institution, the major focus is on the interests of lecturers and the educational institutions more than the interests of students. Milliken and Barnes (2002) also indicate that students outlined that lecturers pass on essential content with them (students) as passive learners. These reports prove that educators sometimes cover the content in classroom just to finish the syllabus, without involving the remedial actions to assist students who may be left behind. However, there might be factors, such as subject duty overload, little time, and sometimes personal reasons like lack of awareness or skills, influencing the use of different teaching approaches. This suggests that Agricultural Sciences educators need self-introspection to reflect on how they conduct their lessons and factors affecting effective execution of their duties.

Furthermore to the above studies, one for the major ideas and attributes of all aspects of teaching-learning from experience is that of reflection, Boud and Walker (1998) wrote. Pertaining the significance of making reflections a culture or habit in education, Dewey (1933) states that, while educators cannot learn or be taught to critically think consciously (awareness of reflection), they do have to learn how to think well, especially acquire the general habit of reflecting. Dewey perceives reflection as a tool that precedes intelligent remedial action. This means that reflective thinking improves one's philosophy and practice (Dewey, 1933; Khoza, 2015c; Van Manen, 1977). Van Manen (1977), agrees with Dewey (1933) by outlining that critical reflections can help educators to transform since reflection can be based on past actions (retrospective reflection), future actions (anticipatory reflection) or be based on current action (contemporaneous or action reflection). This suggests that educators should also reflect on their past, which can also be associated with professional reflection, as described by Khoza (2015c). The fact that anticipatory reflections are based on the future implies that reflections are also rooted on personal perceptions (psyche reflections). Psyche reflection, which is responsible for one's personal thoughts, is the seat in the faculty of reasoning. Dewey's assertion of action reflection, which is grounded on current issues of society and politics, is aligned with the practical reflections elucidated by Schon (1987).

Practical or action reflection can be written as pragmatic reflection because it is guided by practical, and moral forces of society; technical reflection (Van Manen, 1977) are regarded by Zeichner and Liston (1987) and Khoza (2015c) as professional reflection, and can be written as performance reflection because it is guided by the knowledge, skills and aptitude.

However, reflections may not only be on actions, but also thoughts/perceptions (conceptual reflection) where the doing part (what educators do) is put aside and the focus becomes on what educators think/believe (Schon, 1987; Zeichner & Liston, 1987). Thus educators need to reflect on their past and present experiences/practices to construct future goals and predict remedial action/s to challenges that might come their way.

In addition to the above, the South African curriculum has changed continuously the last 2 decades in order to transform the education system bequeathed to its citizens by the apartheid (Motshekga, 2011). The changes in education reform require educators to also change their pedagogical approach and mind set to fit with the transformation done (Kehdinga, 2014a). Changes in curriculum in South Africa was, and is still, influenced by political interventions that allowed the constitution to come up with practicable aims, including establishing a society based on democratic values, social justice, and fundamental human rights. Also, to improve the quality of life for all citizens in order to live and work in a free democratic society (Motshekga, 2011). This clearly indicates that curriculum reform is influenced by politics (Spreen & Vally, 2006), and the political dimension in education starts at the international level to national level and ends up at classroom level, which includes nano (individual) curriculum (Kehdinga, 2014a, 2014b; Khoza, 2015c). This indicates that educators' reflections on their practices of Agricultural Sciences Curriculum and Assessment Policy Statement (CAPS) might also be influenced or affected by political dynamics. The above statements are even supported by Apple (2003) & Mpungose (2016) when reporting that curriculum is a political document and education is constructed politically by the ruling party. For that reason, when educators reflect, they need to be aware of the political dynamics that affect how they implement/enact curriculum.

Furthermore, a school or any educational institution builds a society because it is where learners/students, academic and non-academic (support) staff assemble (Apple, 2003; Mpungose, 2016; Zeichner & Liston, 1987). This suggests that, when there is an assembly (or a cohort) there is a society. The national constitution, together with the institutional constitution is a symbol of hope for social justice because it guides all members in a society to participate based on common principles (Spreen & Vally, 2006). However, despite the national law, unjust social influence in education remains pervasive (Pansiri, 2008). A study by Pansiri (2008) entitled "Improving commitment to basic education for the minorities in Botswana: A challenge for policy and practice", evaluated the level of commitment of primary schools of remote area dwellers to basic education. Questionnaires and semi-structured interviews were used to generate data and the main focus was on the commitment of schools to school-community partnership in school governance and involvement of parents in the way curriculum is delivered (implemented/enacted). Results from the study show a significant relationship between educators' perceptions and the variables such as the area of school, the school governing body, school management team, and the experience of educators. Also it is revealed that learners' academic performance depends on educators' performance which is affected by policy environment and school management practices. This suggests that how the school is managed and the parents from the community, with the community itself, can sometimes hinder how educators educate. This justifies a need for agricultural science educators to reflect on how school society and location affect how the curriculum is implemented.

Furthermore, Motala (2001); Pachler, Makoea, Burnsc, and Blommaerta (2008), concur with findings by Pansiri (2008) because the study also indicates that rurality or remoteness of the areas, where a school is situated, hinders educators from working in collaboration with educators from other schools and actively participating in socio-economic and political activities driven from the institution. Additionally, common features of remoteness/rurality include: school curriculum that lacks sensitivity and compassion to local context; language of instructions (English) excludes/eliminates parents and children in the locality; curriculum that embraces mono-culturalism and a homogenised view of child identity; education that is aligned to rejection of cultural diversity; and education system that sometimes promotes social inequality. However, national policies, including CAPS, have clearly indicated the eradication of social injustices for everyone to stay and work comfortably, but institutional as

well as micro-ideological dynamics affect the wellbeing of educators in schools (Pachler et al., 2008).

In this regard, agricultural sciences educators should be first taught explicitly about the above discourses (psyche reflection, pragmatic reflection, and performance reflection) by which teaching-learning is constructed in order for them to reflect more critically on their professional practices.

2.3 Prepositions (Curriculum enactment and Curriculum implementation)
In human societies, children are initiated into certain modes of making sense of their daily experiences and their world into a set of norms, skills, and knowledge which are required for society's continuance (Egan, 1978). Mostly, the curriculum of initiation, from national (Macro) level, is never questioned as sometimes it is enshrined in politics, myths, and immemorial practices that have unconditional authority (Egan, 1978; Vilegas & Lucas, 2002). Such curriculum, which is developed at MACRO level, is described by Van den Akker et al. (2009) as Instrumental curriculum and it is final. There are five curriculum development approaches which will be discussed in section 2.4 below.

However, over the past years, because of social and political transformations from the apartheid to the democratic regime, curriculum reform has been questioned and studied by several researchers, as practices have evolved with time (Hoadley & Jansen, 2013; Kabugi, 2013; Kehdinga, 2014a; Orstein & Huskins, 2004; Pachlera et al., 2008; Thobega, Subair, Mabusa, & Rammolao, 2011; Van den Akker et al., 2009; Van Manen, 1977; Walsh, 2015). The word curriculum is however defined by Van den Akker et al., (2009) as an educational plan for learning which is imparted in series of lessons. Furthermore, the word is elucidated by Hoadley and Jansen (2013) that it originates from the word '*currere*', a Latin word which means a race or the course of a learning race. How curriculum is represented/planned or intended to be put in place determines if it should be enacted or if it should be implemented (Khoza, 2015c). This suggests that, curriculum enactment and curriculum implementation are intermediate layers between the intended/planned and attained/achieved curriculum.

2.3.1 Curriculum enactment

In South Africa, the planned/intended curriculum, which is a formal official document from the Department of Education, entails most of the activities which need to be done by educators at MICRO (school) curriculum level (Khoza, 2015c). Since democracy in 1994, South Africa has had a number of curriculum reforms aimed at redressing the disparity and prejudice caused by the apartheid regime policies (Bantwini, 2010). Furthermore, Motshekga (2011) asserts on her foreword drafted in a policy document of the Department of Education (2011) that, the curriculum division of the apartheid era was eradicated by the introduction of Curriculum 2005 (C2005) that was rooted on outcomes-based education. Due to the experiences of enactment, in 2000, Curriculum 2005 was reviewed and this led to the first curriculum revision: the Revised National Curriculum Statement Grades R-9 and the National Curriculum Statement Grades 10-12. These revised curricular were further launched in 2002 and replaced C2005, in which in 2005 both curricula were combined in one policy document known as National Curriculum Statement Grades R-12 (Motsheka, 2011). However, despite the revision and change in reform, OBE continued to be functional as it was seen as an approach underpinned by social values such as non-racialism and democracy, peace, prosperity and non-sexism (Bantwini, 2010; Jansen, 2002; Motshekga, 2011).

Furthermore, the above assertions agree with a study conducted by Khoza (2015c) which also reveals that before democracy, during the apartheid regime, curriculum in South Africa was driven by the Christian National Education (CNE). CNE was rooted on an ideology that teaching and learning should be through a drilling method that encouraged rote learning and limited high-order thinking. The National Curriculum Statement Grades R-12 which was introduced in 2005 together with the outcomes-based education ideological-ware resources/principles/beliefs/theories followed Bernstein's horizontal discourse and competence curriculum model.

Additionally to the above reports, a study conducted by Nakabugo and Sieborger (2001) indicates that Curriculum 2005 was introduced to replace CNE with many good intentions and an abundance of perceived educationally correct rhetoric. The study further states that, it required educators to make a paradigm shift from their old teaching practices to new ones. Seven Grade 4 educators (educator 1 to 7) teaching the English subject were selected to

participate in the study, in which three of them taught in previously 'whites only' schools while the rest taught in previously African/black schools. One hour video recordings during English lessons were the main tools used to gather data, and were supplemented with pre- and post-lesson interviews and questionnaires. In all the previously 'whites only' schools, there were also isiXhosa speaking learners who were also assessed on fluency of reading English and compared to English speaking learners. Results from the study revealed that some educators (educators 2,3,4,5 and 6) assessed learners' comprehension and conceptual skills by asking closed questions, while other educators asked open-ended questions. Educators 4, 5 & 7 also assessed by extracting words from the text and asked learners to read them and give their own meaning. Only educator 1 asked learners to dramatise what they were reading.

Moreover, from the results above, Nakabugo and Seiborger (2001) report that one of the seven educators assessed comprehension through asking learners to apply what they were reading on real life situations and other contexts. This suggests that in competence/integrated/horizontal curriculum which is outcome-based (Bernstein, 1999; Hoadley & Jansen, 2013), educators sometimes missed using opportunities to assess sufficiently by only providing praise for the correct responses. Some educators from the study missed the opportunity by asking other learners to decide correct/incorrect answers without any remedial comment (Nakabugo & Seiborger, 2001). The study concluded that in competence curriculum (Curriculum 2005 and National Curriculum Statement), enactment of the curriculum limited educators' opportunities to assess and enhance learners' abilities to develop independent thinking skills. Educators were only suppliers of information, thus, no learning and independent thinking took place on the part of learners. This indicates that C2005 failed in South Africa because some of the reasons were around the wrong practices that privileged performance curriculum, where educators become information suppliers. Competence-based curriculum is about the achievement of outcomes using different experienced activities to present both learners' specific content and context. However, educators seemed to do justice in terms of assessing learners' achievement of outcomes, where constant testing was about checking if learners had achieved the outcomes. However, there might still be educators who still use the 'banking' approach or route teaching regardless of curriculum change/reform. Proper understanding of such issues could assist educators to reflect on their practices in order to understand that different assessment methods will enhance learners' independent thinking skills, as learners also learn differently.

Furthermore, the above study by Nakabugo and Sieborger (2001) has portrayed some sense of segmentation of knowledge where educators assess learners based on what they (educators) deem to be important for learners. This feature of knowledge being segmentally differentiated is identified by Bernstein (1999) to be a horizontal curricular discourse. Bernstein further states that a horizontal discourse means that the knowledge segments do not have equal importance, clearly some are more important than others. Thus Nakabugo and Sieborger (2001) asserted that educators, in the process of segmenting certain knowledge as more important, miss the opportunities to discover the significance of other approaches. Muller, Davies, and Morais (2004) who seem to be motivated by the enthusiasm and intense devotion to Bernstein's ideologies, also concur with these assertions as they indicated that the re-contextualisation of segments of horizontal discourses in school subjects' content doesn't necessarily lead to more efficient acquisition and is usually confined to less capable learners, diminishing vertical discourses to a set of approaches to improve functioning in the day-to-day world. This statement by Muller et al., (2004) is rooted from an argument by Bernstein (1971, p. 215) that the "pedagogical frame is relaxed to include everyday realities... usually with the less able children whom we have given up educating". Muller and Taylor (1995) also argued that the day-to-day experiences (indigenous knowledge) can have a significant role to play in formal schooling if it is used to grant an entrance into the formal schooling, rather than as a means to confine certain learners to the intellectual cul-de-sacs of manual work and domestic life.

In addition to the above, Bernstein (1999) articulates that in a horizontal discourse, knowledge acquisition is competence based, rather than graded performance. In South Africa, competence curriculum was driven by specified outcomes that were divided into seven critical outcomes, and five developmental and learning outcomes (Khoza, 2015c; Khoza and Manik, 2015). Moreover, Khoza (2015c) points out that, in competence curriculum, observable/achievable outcomes is the key to practice, and the levels of outcomes (lower, middle and higher order) were not considered as significant. This suggests that the achievement of outcomes became the focal point, irrespective of the levels and how the outcomes were achieved. This is in line with a stipulation by Schimdt (2012) that, in this curriculum, educators inculcate specific skills and content to learners according to what the policy document indicated. What is important is that at the end of the day learners are

expected to arrive at an outcome (Hoadley & Jansen, 2013). This suggests that there must be a strong link between how learners learn and what they have learned.

Furthermore, Khoza (2015c) together with Bernstein (1999) describe knowledge, in competence curriculum, as horizontally generated from simple sources or local known sources. This implies that learning was mostly influenced by oral conversation through opinions and local everyday or general knowledge. For this reason, assessment is mostly not based on the hierarchy of steps or levels of cognitive domain but what the learners/students managed to achieve/attain irrespective of what the international standards expect (Khoza 2015c; Pinar 2004; Schimdt, 2012; Schiro, 2013). Hoadley and Jansen (2013) share the same view with Bernstein (1999); Khoza (2015c); Muller et al., (2004) that competence curriculum, as a horizontal discourse, encourages the knowledge that comes from people's judgments/opinions as everyday knowledge that inculcates one's ideology. Also, at times it gives praise to the learner/student as s/he will be seen by the society as more superior than others. For this reason, competence curriculum enhances confidence and at times boosts the ego of those seen to achieve measurable outcomes than others (Bernstein, 1975, 1999; Khoza, 2015c). In other words, learners/students who achieve more outcomes than others are likely to be more recognised in society, irrespective of their intellectual differences. It is also clear that competence curriculum is not a function of professional /content vision for teaching since the knowledge from lower level to higher level is not important, as opposed to the vertical process. This suggests that competence curriculum is rooted on societal norms, culture, and local context more than the international perspective.

In addition to the above, Hoadley and Jansen (2013) agree with Bernstein (1999) that competence curriculum enactment embraces social visioning as it places society at the centre of teaching-learning environment as the integrated /horizontal curriculum. Then the combination of subjects forms a learning area. This was evident when Mathematics, Physical Sciences and Technology were combined into a single learning area during Curriculum 2005 (C2005), Revised National Curriculum Statement (RNCS), and National Curriculum Statement (NCS). From the above statements, it is evident that since subjects form learning areas, assessment is based on what learners know, as Hoadley and Jansen (2013) also assert. This suggests that learning is more important than teaching during teaching-learning process,

and learners are allowed to not have the same learning outcomes as they learn differently, and at different paces. In other words, learners do not fail, because they are allowed to achieve different outcomes at different levels of teaching. Thus, literature emphasises that competence/integrated/horizontal curriculum was rooted on principles of outcomes-based education (Brodie, Lelliot, & Davis, 2002; Hoadley, 2007; Hoadley and Jansen, 2013; Jansen, 1999, 2002; Khoza, 2015c; Muller et al., 2004; Muller & Taylor, 1995; Nakabugo & Sieborger, 2001).

Furthermore, Brodie et al., (2002) outlines that the enactment of OBE embraced the conception of learner-centred approach to transforming children's lives, and ultimately the larger society. Regarding learner centeredness, Cuban (1998) outlines that competence/ integrated/horizontal curriculum was seen as a means of providing personal and social development through curriculum, and this gained psychological support from the principles of Piaget's theory of development which argues that children enthusiastically construct their own concepts, which differ from adults' conceptions of the world. Also, children's ideas or thinking processes are primarily influenced by their environment in which they live and learn. For this reason, Brodie et al., (2002); Cuban (1998) have similar assertions to those by Hoadley and Jansen (2013) that the adoption of learner-centred curriculum builds learners' confidence on the curriculum in the view of the fact that they have control over the way they learn, when they learn. Thus, in a competence curriculum, learners can use a different pace and techniques to comprehend the concepts in a particular context. This may help educators when reflecting on their practices of agricultural science curriculum in order to understand and appreciate learners' diversity and learners will not learn at the same pace. Some are fast learners while some are slow learners, but what is important is that all learners should learn, irrespective of their personal, social, economic, cognitive, and psychological differences.

Additionally, the above literature allows one to link curriculum enactment with a pragmatic gesture of approaching curriculum, as described by Freire (2005). Freire believes that teaching and learning should not only be guided by scientific discoveries, but that it should also try to instil its findings into learners with different backgrounds and experiences so that it affects how they learn. Competence/integrated/ horizontal curriculum is also aligned with an assertion by Eisner (1979), an advocate of artistic approach to teaching. This involves

educators deciding what they see as significant based on how quickly or slowly their learners learn. Artistic approach is discussed in detail in section 2.4.3. Stenhouse (1975) also shares the same judgement with Eisner and Freire. Hoadley and Jansen (2013) regard Stenhouse's approach as a 'process approach' since Stenhouse sees educators as facilitators of learning, rather than just transmitters of knowledge.

From the literature above, the discussion suggests that during content (knowledge, values, skills, and attitudes/habits) delivery, educators should take selfless consideration of the general characteristics, developmental and otherwise, of diverse groups of learners. Furthermore, the literature above suggests that there should be maximum acknowledgement and accommodation of different learning styles and rates during assessment processes. The modes in which different cultural/societal values and lifestyles affect the construction and reconstruction of knowledge should also be acknowledged and incorporated in the development and implementation of teaching-learning of agricultural sciences.

2.3.2 Curriculum implementation

Motshekga (2011) indicates that further challenges of curriculum enactment, as discussed in the previous section (2.3.1), resulted in another review of the National Curriculum Statement in 2009, to produce a curriculum called the Curriculum and Assessment Policy Statement (CAPS) document. CAPS has been actively implemented since 2012. Khoza (2015c) asserts that the present curriculum (CAPS) is driven by an ideology/belief/theory of performance/collection/vertical curriculum discourse where subjects are demarcated from each other and focus is not on what learners know, but what learners don't know. This suggests that curriculum is not enacted, like in competence/ integrated/ horizontal curricula such as C2005, RNCS, and NCS, but implemented as the notion of teaching is to move from the known to the unknown. Thus, Hoadley and Jansen (2013) advocates that performance curriculum knowledge is imposed from the outside/international standards, and not upon the local standards to accommodate what learners already know from their different societies.

Furthermore, during implementation of performance curriculum, Hoadley and Jansen (2013) emphasise that professionalism is key to meeting international standards, and such a

curriculum is run hierarchically according to various criteria into successive levels or layers. This emphasis is in line with an assertion by Bernstein (1999) together with Bloom (1975) that learning is hierarchically organised, coherent and explicit with systematically principled structure. This makes such curriculum approach a vertical discourse (Bernstein, 1999), which gives greater privilege to the cognitive domain (Khoza, 2015c, 2015d). The hierarchy of cognitive domain is composed of six successive levels. The levels are 1. Knowledge; 2. Comprehension; 3. Application; 4. Analysis; 5. Synthesis; and 6 Evaluation (Kennedy, Hyland, & Ryan, 2006). The above levels of cognitive domain are discussed in detail in section 2.5.2 below. Since performance curriculum is systematic/hierarchic, when educators are educating and assessing learners/students, they should bear in mind that learning is a process with several developmental stages, and educators should try to get the thought processes of the learner/students to move up into the higher order stages of synthesis and evaluation (Kennedy et al., 2006). This suggests that educators should be well aware of the learning levels when implementing the performance curriculum.

Moreover, the above assertions by Bernstein (1999); Bloom (1975); Kennedy et al. (2006) and Khoza (2015d) resemble the one by Hoadley and Jansen (2013) that competence curriculum focuses on high levels of understanding with precise content and sequenced formal school knowledge. Thus, this curriculum places discipline/content at the centre of teaching and encourages international knowledge and collection of knowledge to ensure that all basic knowledge is imparted. Bernstein (1999) further elucidates that there are firm distributive rules regulating access, transmission and evaluation of knowledge in performance curriculum where time, space, and knowledge transferors(educators) are the main agents of these regulations. Hoadley and Jansen (2013) have the same viewpoint with Bernstein, by stating that educators should consider knowledge, assessment, time, space, learner and approach, as key factors, in order to understand and reflect on the performance curriculum.

Additionally, in performance curriculum educators are the ones setting the sequence and pace with which the teaching-learning process will move (Khoza, 2015c). However, educators should make sure that learners receive maximum assistance in understanding the content, growing cognitively, and meeting learning outcomes (Khoza & Manik, 2015). This indicates that learners have little control over what they are taught since educators decide what to teach

and teaching is a direct transmission of knowledge. (Hoadley & Jansen, 2013). This suggests that in terms of pedagogical activities, focus is not primarily on the learner but on the subject matter, with little or no link/integration between subjects and between formal school knowledge and everyday knowledge. Also, this means that subjects are demarcated, meaning that each subject stands on its own and the assortment/collection of its content/terms/concepts are purely established and set up specifically for that subject (Bernstein, 1975, 1999; Hoadley, 2012; Hoadley & Jansen, 2013; Tyler, 1959). Therefore, in the performance curriculum, school knowledge and international standards are used in making decisions and the concentration of assessment is mostly on what learners should have achieved/learned more than what they have learned (Khoza, 2015c). This suggests that performance curriculum focuses on what is still cognitively missing since learners are supposed to learn from the lowest content level of cognition to the highest content level of cognition in a particular subject/discipline. This, in performance curriculum, becoming more proficient in the subject/discipline content is more important that the reconstruction of agricultural knowledge.

Bernstein (1999) further states that, because performance curriculum is systematically put in practice, it includes a collection of all necessary information in a prescribed manner to develop school knowledge. The exclusive processes of knowledge collection also make this curriculum a collection curriculum, in which its manner of knowledge formulation allows the knowledge to be recorded and written than orally shared. Moreover, Muller and Taylor (1995) affirm that knowledge only orally shared tends to vanish and be forgotten over time, but written knowledge never vanishes over time. Thus Bernstein (1975) asserts that formal school knowledge is based on scientific research which is proven and recorded. With the systematic principle of collection/performance/vertical curriculum, generalisation of knowledge based on local context does not apply; instead knowledge is precise, specific and based on evidence (research).

The literature above suggests that the curriculum is implemented in a vertical discourse where there is a strict and precise power structure to follow. Therefore, curriculum implementation goes hand-in-hand with the instrumental approach. Such an approach is entrenched on a systematic design process and is objective in nature (Tyler, 1959; Van den Akker et al., 2009). Instrumental approach will be discussed in section 2.4.1 below. A

pragmatist, Paulo Freire, is a critic of such an approach, together with an artistic approach advocate, Elliot Eisner, who believes that educators should possess the necessary skills and the ability to value educational relevance of activities to be employed during teaching and learning.

In this regard, school knowledge, that is hierarchic and systematic with specific topics to be covered in a specific time frame, is seen to be more embraced than local knowledge in the South African Curriculum and Assessment Policy Statement (CAPS). Based on the above assertions, it is clear that CAPS, is a performance/collection/vertical curriculum, and since it is implemented it would be easy for educators to reflect on their implementation practices.

2.4 Approaches to curriculum development

Curriculum development entails improvement and innovative strategies employed in the development of education (Van den Akker et al., 2009). The manner at which the strategies are employed determine how basic knowledge/values are transmitted from one generation to another (Tyler, 1959). Various approaches are used in education (Bernstein, 1975; Hoadley, 2012; Hoadley & Jansen, 2013; Khoza, 2015c), and Van den Akker et al. (2009) identify four types of curriculum development approached: instrumental approach, communicative approach, artistic approach, and pragmatic approach. This suggests that how curriculum is developed and put into practice depends on the approach envisages by the curriculum developer. Furthermore, these curriculum development approaches take place at different curriculum development level, from Supra to Nano curriculum (Van den Akker et al., 2009).

2.4.1 Instrumental approach

The instrumental approach is embedded on logic principles designed methodically or analytically with clear and measurable aim and objectives (Van den Akker et al., 2009). Thus, this approach gives much emphasis to the importance of a systematic design process. An assertion by Kennedy et al. (2006) that, for any curriculum development process to be successful and sustainable, aims and objectives need to be intensively outlined. This suggests that, when there are clear measurable objectives, the implementation of curriculum is aligned to the formulated objectives. Van den Akker et al. (2009, p. 16) further point out that "these

objectives provide the reference points for the design process", which makes objectives the core of the instrumental approach. The curriculum objectives become the decisive factor that determined the selection of needed materials, outlining of content, procedures of instruction are developed and tasks and examinations are prepared (Tyler, 1959). This suggests that, in instrumental approach, all features of the educational programme are really revenues to accomplish basic educational intentions.

Furthermore, Van den Akker et al. (2009) and Tyler (1959) both share the same view point that, if a curriculum is to be developed and efforts for continued improvement are to be made, for instrumental approach, it is obligatory to have some conception of the goals that are being aimed at. This is also reported in an empirical study by Sarantopoulos and Tsaparlis (2004) who used chemical analogies to determine their effect on the attainment of cognitive and effective objectives. One-hundred and forty eight tenth-grade Greek learners were used, where attention was paid to the structural correspondence between the analogue and the specific objectives to be attained. The study revealed that after the introduction of each chemistry analogy, as well as from final exams, with concrete set of objectives and learning outcomes to be achieved, learners learn according to the curriculum's set pace. Additionally, the study reported that using analogies can be effective for lower cognitive development learners. The teaching and learning strategy is perceived to produce intellectual competitive and curious students, with educators playing a major role in instructing what needs to be done. This suggests that curriculum, in this regard, should be goal orientated in order for specific learning outcomes to be attained.

Moreover, Van den Akker et al. (2009) outline four fundamental questions, identified by Tyler (1959) which that must be answered when developing any curriculum plan of instruction. These are:

- What objectives should education seek to attain?
- Which teaching and learning experiences are the most suitable in order to attain these objectives?
- How could these teaching and learning experiences be organised effectively?
- How can we determine whether the objectives are being attained?

These questions are described by Tyler (1959) as a functioning instrument of education in an instrumental curriculum design approach, and these questions formulate *Tyler rationale*. However, Tyler asserts that many educational programmes do not have clearly defined objectives; as a result some educators fail to give satisfactory reply when asked about what the teaching and learning objectives are aimed at. Also, as much as Tyler confidently affirms that curriculum should be rationale and goal orientated, Van den Akker et al. (2009) asserts that, there are shortcomings of such approach (instrumental), as it focuses only on the vertical discourse, as described by Bernstein (1975), and less consideration of individual/personal aspects of educators and learners. Furthermore, the instrumental curriculum development approach is less flexible in adjusting to adjust to adjust to the diverse needs of users, growing insights of designers, and socio-economic aspects have little or no space to fit in instrumental approach (Van den Akker et al., 2009). This suggests that, this approach, like performance/collection/ vertical curriculum (Bernstein, 1999; Hoadley & Jansen, 2013), does only encourages school knowledge which is taught methodically with simpler tasks that build on each other to make more complex tasks.

Furthermore, instrumental approach seems to very analogous to the current South African curriculum, CAPS, that is developed to be implemented in a hierarchical manner, as discussed in section 2.3.2 above. I am confident to say CAPS is an instrumental curriculum, as its main focus is on the objectives of each subject taught and its content (Hoadley & Jansen, 2013). This suggests that, what learners learn is not based on their experiences outside classrooms, and at homes, but on the prescribed/ intended curriculum as planned by the National Department of Education (NDE). In addition, the assessment on instrumental curriculum, like CAPS, follows a vertical approach (Hoadley & Jansen, 2013), and if learners don't meet specific levels, they fail. Lastly, no negotiations can be done because the purpose has been clearly stated and no developments can be incorporated into the final design (Tyler, 1959).

2.4.2 Communicative approach

In the previous section, paragraph 2.4.1, closes with an assertion on deliberation and negotiation in curriculum development. As much as none of these aspects (deliberation negotiations) are considered during instrumental curriculum development, there is a firm

emphasis of their significance in communicative approach (Van den Akker et al., 2009). Communicative approach also puts more emphasis on comparative and relational systematic plan of action (Tyler, 1959). Therefore, this means that in communicative approach, all affected stakeholders take part in the development stage. Thus, Van den Akker et al. (2009, p. 17) emphasise " …building relationships with stakeholders and soliciting the input of developers and other parties involved are crucial". It is therefore fundamental to consider reflections of everyone involved in the curriculum.

Furthermore, the significance of relational strategies in curriculum development has been emphasised by many other researchers who focus on curriculum planning, development, implementation and enactment (Ainscow, 2005; Askell-Williams & Murray-Harvey, 2013; Bantwini, 2010; Berkvens et al., 2014; Bond, Keogh, & Walker, 1985; Carl, 2005; Czerniewincz & Brown, 2014; Egan, 1978; Jansen, 1999; Kehdinga, 2014a; Khoza, 2015c, 2015d; Mann et al., 2009; Mansfield, Wosnitza, & Beltman, 2012; Muller & Taylor, 1995; Pansiri, 2008; Pinar, 2004; Schimdt, 2012; Schiro, 2013; Shulman, 1987; Taole, 2013; Veronesi & Varrella, 1999; Walsh, 2015; Zeichner & Liston, 1987). All stakeholders' (designers, educators, learners/students and parents) reflections and perceptions of the curriculum, and factors that underpin its success and sustainability, form the starting point of communicative approach (Van den Akker et al., 2009). This suggests that communicative approach is more subjective, not objective than instrumental approach. Everyone's view is important and different views, knowledge, negotiations, and discussions/assertions are necessary to provide a more intelligent and considerate base for decisions about the curriculum and its objectives (Tyler, 1959).

With regards to the reflections of all parties involved in curriculum, from planning to implementation, see a case study by Ngubane-Mokiwa and Khoza (2016) which asserts that innovative teaching is a concept based on learner- or student-centred teaching strategies. The study explored lecturer's experiences of teaching STEM to students with disabilities as most traditional curriculum teaching strategies exclude disable students. From the in-depth e-interviews and class observations, the experiences of lecturers were used to guide the development of inclusive and equitable technology integration curriculum model. Another study by Khoza (2015d) showed the same assertion by reporting that the teaching of STEM

subjects has always been designed as being based on models that require both the educator and the student to have similar physical ability. This suggests that communicative approach supports inclusivity in education, and thus reflections on practices or experiences of educators should be considered during curriculum development.

Furthermore, communicative approach, as described by Van den Akker et al. (2009) to be more of a socialistic, that individualistic, artistic or pragmatic approach as all interested parties have their own visualisation on the problem situation and the desired transformation and improvement. This approach is also affirmed by Pansiri (2008) who explored challenges between policy and practice in Botswana. The research question of the Pansiri's study focused on the level of commitment of schools to universal basic education, school-community partnership in school governance and parental involvement in school curriculum implementation processes. Curriculum developers at the national department of education should take into account how feasible the policies are, at school and classroom levels (Pansiri, 2008). In order for developers to understand the feasibility factor, they should consider the involvement of principals (Hoadley, 2012), teachers/educators/lecturers (Gillies & Boyle, 2010; Khoza, 2015c; Pedro, 2005), students/learners (Connors & Elliot, 1996; Kehdinga, 2014b; Khoza, 2015a, 2015d; Khoza & Manik, 2015; Temur, 2007) and society/parents (Bantwini, 2010; Mbajiorgu et al., 2014; McDonald, 2008; Pachler et al., 2008; Spreen & Vally, 2006; Waithera, 2013). Thus, communicative approach is rooted on an ideology that all parties should be involved for a consensus to be reached.

Moreover, from the above assertions about communicative approach in curriculum development, it is why Walker (1971) developed a *deliberative model* which is naturalistic, and reflects the actual practice of curriculum development. Van den Akker et al. (2009) has described the deliberative model as constituting of three phases:

- The platform of ideas: this is the first phase of curriculum development where designers and other parties engage together and discuss their views and opinions about the problem, while striving for consensus.

- Deliberation: here, the designers and other parties involved generate possible solutions for the problem identified and discuss/debate the most desirable and suitable solution.

- Design: during this phase, the most desirable solutions are transformed into a draft of the final product which is the policy document

From the above model, it is evident that social factors are greatly considered during communicative curriculum development, and for this reason, such curriculum accommodates diverse concerns of everyone affected. However, Van den Akker et al. (2009) claims that this model is time consuming/ lengthy and overwhelming. The nature of communicative approach resembles the competence/ integrated curriculum model which was identified by Bernstein (1975) and Hoadley and Jansen (2013) to encourage everyday knowledge that comes from people's opinions. Thus, in this view, knowledge is located on the problems, rather than subjects that are given to students.

In addition to the above, since CAPS is a performance/collection curriculum, and it focuses on high level of understanding from development to implementation phase (Hoadley & Jansen, 2013), its knowledge is only based on proven reports (research). The social factors which are based on beliefs and experiences are not considered as important in CAPS. This suggests that, other stakeholders such as school educators, learners, parents and other community structures, socio-economic status of school societies including where the school is located, are never put on the agenda when CAPS was developed. Even currently, CAPS takes no account for how parents and learners perceive the curriculum. CAPS is not flexible and somehow not inclusive since its policies are developed only by curriculum developers as the MACRO (national) level (Khoza, 2015c). This suggests that, communicative curriculum approach in South Africa is more practicable at MESO (school/institution) and MICRO (classroom) levels where the SMT together with the subject educators decide to include the SGB, parents, society (former students/learners and religious leaders) and other departments (such as social development and correctional services) to be involved in certain decision making processes of schools.

2.4.3 Artistic approach

Tyler (1959) mentions that there is no doubt that some outstanding educational work is being performed by artistic educators who do not have a much clearer conception of curriculum goals, but do have an intuitive sense of what is good teaching and learning. Tyler (1959) further states that such educators know exactly what materials are significant, what topics are worth dealing with and how to present material and formulate concepts effectively with students. Therefore, this makes artistic approach to be more dependent, and put more emphasis, on the creativity of the designer (Van den Akker et al., 2009). This suggests that, there might still be educators who don't prescribe to the rules/norms of the nationally drafted curriculum policy statement nor even what the school managers (SMT) instruct, to be done inside classroom. Such educators are the ones which are regarded by Tyler (1959) as artistic educators and these educators may aesthetically say they aim to develop a well-educated citizen and are teaching a particular subject because it is essential to a well-rounded education. Thus, Van den Akker et al. (2009) assets that in an artistic approach, there are no objective criteria or permanent set of procedures to follow; what matters is the designer's inventiveness and resourcefulness to perform his art.

Furthermore, in an artistic curriculum design, intended goals are simply matters of personal preference of designers who are the artists of the curriculum (Tyler, 1959). The designer has a strong belief and trust in him-or-herself and is always envisioning of how best to put into practice the imaginations. The intense self-trusting belief the artist has, allows him/her to only be guided by his/her own intuition, taste and experience in the design process (Van den Akker et al., 2009). This approach seems to be supported by Dewey (1933) who believes that educators should always reflect their practices as they constantly formulate their own ideologies of what is best for learners/students. Dewey further asserts that when educators are allowed to be artistic and creative, they enjoy their work whilst they improving their teaching skills to overcome curriculum challenges.

Moreover, see a qualitative critical action research conducted by Khoza (2015b) where six Grade 12 high school educators used *Turnitin* as part of their assessment processes. The educators aimed at preventing learners from plagiarising other people's work. However, the study concluded that *Turnitin* did not help educators to prevent all learner acts of plagiarism.

CAPS does not have anything specified on plagiarism prevention for primary and secondary schools, and based on the study, Khoza (2015b) shows that educators can be creative and incorporate means to transform curriculum and produce better students. This suggests that, artistic curriculum is feasible as a Micro (classroom) level where educators use their own strategies and methods, even if they are not prescribed by the national curriculum policy document, during teaching and learning. Furthermore, the artistic approach can never be possible at the Micro level, since the national curriculum is rooted on concrete aims and objectives, with specific Annual Teaching Plan (ATP) that specifies topics to be covered, at specific time frames. Thus individual artistry is not accommodated in CAPS, even though educators sometimes become creative and teach what they deem best and relevant for learners (Fomunyam, 2014; Pedro, 2005).

Adding more on the above, Van den Akker et al. (2009) recognise a well-known artistic approach advocate, Elliot Eisner, who acknowledged the skills and the ability of a curriculum designer to identify what is educationally relevant. Eisner (1979) asserts that, education should be a more holistic environment, in which educators play a central role in facilitating the teaching and learning processes through his/her own skills, vision and experience. This suggests that, educators are major role players in decision making processes of what should be taught and how it should be taught. The role of an educator as an instructor can be seen from an assertion made by Khoza (2013a) as he describes educators' role in the curriculum driven by a teacher-centred approach. The issue of educators identifying what is relevant and best for educators is also in line with an assertion by Hoadley and Jansen (2013) that it is vital for educators to choose the relevant approach in order to spot their role in facilitating teaching-learning. This suggests that, in an artistic curriculum, learners/students do not have much to put in themselves, other than abiding with what educators instruct them to do.

Furthermore, it is vital for educators to reflect on their curriculum practices in order to understand how creative they are during teaching-learning. If they are artistic, it has to be explored and understood if CAPS does allow them to be, or they are just implementing the curriculum based on their own visions and experiences. Eisner (1979) points out that reflection on curriculum should be aimed at seven aspects of the curriculum. These aspects are objectives, content, learning situations, organisation of learning experiences, organisation

of content, presentation forms, and evaluation forms. However, Berkvens et al. (2014) and Van den Akker et al. (2009) assert that any reflection on curriculum should be aimed at ten curricular spider web archetypes. See section 2.6 below, each of the ten curricular archetypes is discussed in details.

2.4.4 Pragmatic approach

The word pragmatism is described by Czujko (2013) as the doctrine that embraces practical consequences as the criteria of knowledge, meaning and value. This description is in line with an assertion by Fomunyam (2014) together with one by Tyler (1959) that being pragmatic is an attribute of accepting realities of life and favouring practicality and literal truth. Thus, Van den Akker et al. (2009) states that a pragmatic approach to curriculum is guided by practical experience and observation rather than theory. In this regards, awareness of reflections may promote a good connection between theory taught and practical experiences in education (Khoza, 2015c). Pragmatic approach stresses the significance of developing personal and critical consciousness about cultural, societal, racial, and ethnic diversity in the teaching-learning environment (Khoza, 2015d).

The pragmatic approach's centre of attention is on the practical usability of products of the curriculum, and the development of curriculum takes place in close relations with local practice and users (Van den Akker et al., 2009). This above assertion by Van den Akker et al. (2009) is in line with the one that was made by an education theorists, Dewey (1933), that curriculum should be regarded as a developmental continuum of learning, as it is derived from the Latin word *currere,* to run a course, and should be the series of practical experiences which learners/students must have by way of obtaining curricular objectives. The main objectives of a pragmatic curriculum should then be abilities, attitudes, habits, appreciations and forms of knowledge that learners/students need in order to be competitive in their day-to-day living (Howes, 2013). Thus even Dewey (1933) asserts that pragmatic approach is based on realism as a philosophy of action, and there is no right or wrong answer because designers know for sure that learners/students will make sense of what is taught. This suggests that pragmatic approach is learner-centred and knowledge transmission is mainly through experience rather than talking. The central idea of pragmatic curriculum is experience. The experience is pedagogical/educational, and learning is by doing (Czujko, 2013). This

approach emphasises that when people learn by doing, long-lasting and useful knowledge is gained.

However, "learning by doing is not confined to the physical and manipulative probe of the learner. It means, being self-engaged in seeking understanding and control (Czujko, 2013). This suggests that, pragmatic approach cannot be sustainable and effective if the learners do not have the natural interest of the world they are living in. Furthermore, the differences in attitude of both designers and learners, might result is failure of pragmatically developed curriculum (Czujko, 2013). Unfortunately, the current South African curriculum, CAPS, is not related to the inherent and spontaneous experiences of learners. Due to the disconnection between CAPS and learners' experiences, pragmatic approach can only be designed and implemented at Micro and Nano levels. As a result, it is not that much easier to present the content in CAPS in a way that engages pupils to contribute to the society in return. Principles of CAPS are based more on scientism (Mbajiorgu et al., 2014) than realism/pragmatism (Hoadley & Jansen, 2013). Czujko believes that true interests of learners can have a dynamic power on their academic performances, in which pragmatic curriculum induces that interest by integrating school-based knowledge and everyday life experience.

Furthermore, based on the literature above, CAPS embraces instrumental approach. This assertion is due to the fact that CAPS is not flexible to how practicable the curriculum is. Some schools are resource limited, yet CAPS does indicate the use of resource without specifying the actual resources to be used, especially in remote schools where even for educators, it is difficult to improvise. Yet, at the end of the year, such schools will be assessed/examined equally with their counterparts, resourced schools, with an assumption that all schools have fully attained the intended curriculum effectively and efficiently. The Annual Teaching Plan (ATP) given to educators by national curriculum developers is not flexible for educators to incorporate learners' knowledge based on their experience. Thus, CAPS does not accommodate artistic and pragmatic approach. Educators are implementers of curriculum but have no influence in curriculum planning development stage at national level. This assertion has also been proven by many studies (Asmal, 2000; Bantwini, 2010; Çimer et al., 2013; Kabugi, 2013; Khoza, 2015c; King-McKenzi et al., 2013; Nakabugo & Sieborger,

2001; Ndwandwe & Dlamini, 2013; Swanepoel, 2008; Taole, 2013; Thobega et al., 2011; Wahlstrom & Louis, 2008; Walsh, 2015; Webb, 2009; You & You, 2013).

Moreover, the literature above suggests a need for a study to be conducted using a critical paradigm via action research in order to involve educators to reflect about their approach to curriculum. Also, there should more studies conducted with reflective activities in order to fully explore the relationship between intended, implemented/enacted and attained curriculum, and the approaches used.

The general aspect of the four design approaches are summarized and compared with CAPS in the table, adopted from Van den Akker et al. (2009), below:

	Instrumental approach vs CAPS	Communicative approach vs CAPS	Artistic approach vs CAPS	Pragmatic approach vs CAPS
Sequence of activities	Logical sequence and is accordance with CAPS	No strict sequence and in conflict with CAPS	Completely open process and in conflict with CAPS	Cyclical and in conflict with CAPS
Characteristics of activities	Rational process And accordance with CAPS	Intensive deliberation during a part of the process and is accordance with CAPS	Creative reflection during the whole process and in conflict with CAPS	Frequent evaluation with users and in accordance with CAPS
A good curriculum	Meeting predetermined requirements and accordance with CAPS	Meeting requirements about which a broad consensus exists and somehow accordance with CAPS	Meeting designer's requirements and in conflict with CAPS	Meeting user's requirements and in conflict with CAPS

Table 2.1: Comparison of aspects of curriculum design approaches with CAPS

2.5 Archetypical Model (Conceptual Framework)

Educational reforms and curriculum development, coupled by educators' reflections and perceptions on implementation experiences/practices, have been major concerns in educational dialogues and there have been enormous controversial logical discussions from many researchers (Bernstein, 1999; Hoadley & Jansen, 2013; Jansen, 2002; Kehdinga, 2014a; Kennedy et al., 2006; Khoza, 2013a, 2015b, 2015c, 2015d; Nakabugo & Sieborger, 2001; Ndwandwe & Dlamini, 2013; Ngubane-Mokiwa & Khoza, 2016; Pinar, 2004; Snow, Met, & Genesee, 1989; Spreen & Vally, 2006; Taole, 2013; Thobega et al., 2011; Tyler, 1959; Van den Akker et al., 2009; Waithera, 2013; Walsh, 2015). The above researchers, and many others, have researched on different phenomena for remarkable developments in education/curriculum reforms, where each phenomenon is modelled by a set of archetypes (concepts/ideas) inferred from specific instances. The underlying model interconnecting the archetypes forms a model/framework (Snow et al., 1989). Thus archetypical model (conceptual framework) is the set of archetypes or concepts or ideas that formulate a research in order for each study to have a focal point (Christiansen et al., 2010). This suggests that for any research study to have a precise mode of direction, an archetypical model should be drafted in order to link the archetypes (concepts) that mould the study.

Furthermore, Cochran-Smith (2002) affirmed that a rich conceptual framework is needed to help clarify underlying assumptions, and sort out discrepancies between theory and practice in teacher education research. Cochran-Smith further states that, since curriculum is politically reviewed, passed, and implemented, a conceptual framework in curriculum studies also assists in analysing the ways the discrepancies are entangled with competing political agendas. Thus, in this study, various curricular archetypes, that were developed and identified by Van den Akker et al. (2009) as curricula spider-web concepts, are used to explore educators' reflections on their practices of Agricultural sciences Curriculum and Assessment Policy Statement (CAPS). A study by Berkvens et al. (2014) indicated that at the centre of the spider-web there are ten curricular archetypes that are all interrelated and each archetype is accompanied by a guiding question which act as a steering of curriculum implementation/ enactment for educators. The implementation process of any curriculum should be guided by specific archetypes and all the archetypes should be equally recognised (Khoza, 2015d). Thus, curriculum users should also know and understand all factors that underpin their day-

to-day practices. These curricular archetypes are represented by the fruit tree model shown by Figure 2.2 below:
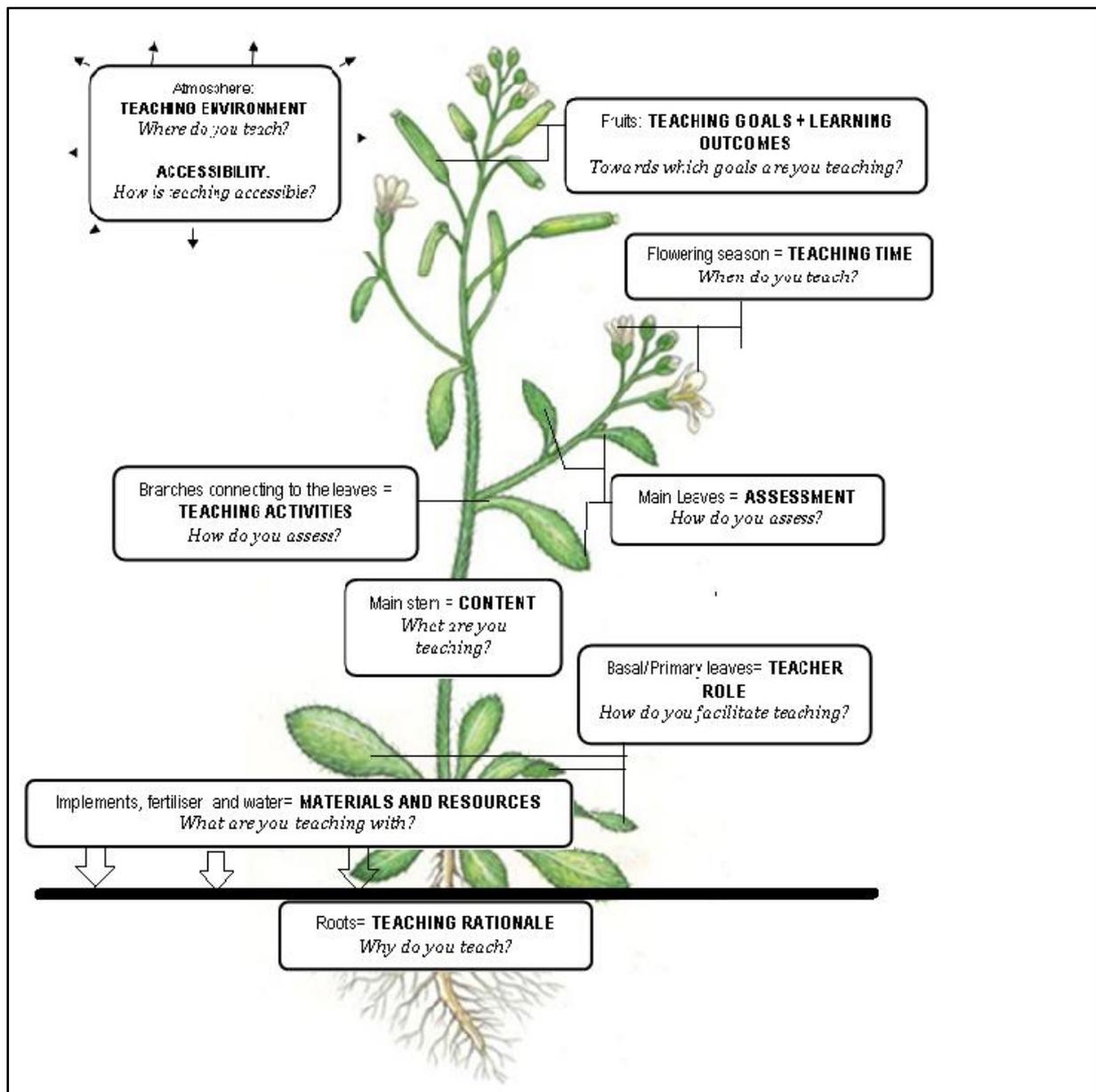
(Picture source: https://Slideplayer.com/slide/6113413.) [Accessed: 17/05/2016]

Figure 2.2: The curricular archetypes fruit tree model

The above fruit model clearly shows how each factor (internal and external) affects the growth and development of a fruit tree in order to produce good quality fruits. This is the same way the curricular archetypes, collectively influence the success of a curriculum. The implements used to plough/till the soil, together with fertiliser and water, as fundamental

resources needed by fruit trees, are linked with teaching material and resources used to facilitate teaching and learning processes. The roots, as an underground and covered component of a tree, are linked to the unseen and intangible rationale of an educator to be an educator. The primary basal leaves give base of the growth and development of the stem, branches and leaves of the tree, and in this case the role of an educator forms an integral part in overseeing the growth and development of learners, and the success of the curriculum. The stem is a central pillar of strength of a tree and harbours all other components. It transports nutrients from the roots up to the leaves, flowers and fruits. Thus, the stem is linked to (with) the content that is taught and determines the topics, activities, assessment methods, time, and the attainment of the goals. The branches connect the stem with leaves and fruits, so as the teaching and learning activities determine the mode of assessment and the learning outcomes to be achieved. Leaves are the primary components that determine if the tree is healthy or not, and any mineral or nutrient deficiency is shown by the leaves. Thus, leaves are linked with assessment activities as they give an idea about the learners' progress and where remedial actions need to be applied.

Furthermore, in plants, flowering does not just happen anytime because there are seasons that are favourable for flowering. The same applies to teaching and learning time which does not happen randomly, but at a specific time with a specific duration for it to take place. Thus, teaching time is linked to flowers or flowering season. Furthermore, the atmosphere, including the surrounding environment in which the tree is located, determines the growth and development of the tree and the fruit. It also determines who and how the fruits can be accessed. Thus, in the model above the atmosphere is linked with environment and accessibility. Lastly, fruits are the end product and are the farmers' main concern. The product quantity and quality will determine the demand and supply and how profitable the business will be. Hence, the goal towards which an educator educates is linked with the fruits as the final product.

In addition to the above, Berkvens et al. (2014) together with the developer of the curricular Spider-web, Van den Akker, indicate that metaphorically the archetypes shows vulnerability of a curriculum. The metaphor is that, if the archetypes are not addressed logically/rationally/consistently, the fruit tree will not bear good quality fruits. This means

that the intended curriculum goals will not be attained due to the imbalance of the factors a tree needs in order to bear fruits. This will then lead to poor productivity of the tree and the curriculum will lose its integrity.

Furthermore, the ten curricular archetypes articulated as the steering questions posed to educators, to guide their reflections of practices, are as follows: Rationale- why do you teach?; Accessibility- who and with whom do you teach?; Goals- towards which goals are you teaching?; Content- what are you teaching?; Teaching-learning activities- how do you teach?; Teacher role- how do you facilitate teaching?; Resources- what are you teaching with?; Environment- where do you teach?; Time- when do you teach?; and assessment- how do you assess teaching-learning?

Furthermore, Van den Akker et al. (2009) outline four quality criteria that give strength to the archetypes. These are: relevance, consistency, practicality and sustainability. The four criteria are unconditionally correlated and each criterion could be applied to each curricular archetype. Thus, if the archetypes are not balanced or coherently addressed, where one is pulled more strongly than the others, curriculum is not relevant, not consistent, not practical and not sustainable. Then, the curriculum will collapse.

The above assertions by Berkvens et al. (2014) and Van den Akker et al. (2009) suggest that the curricular archetypes and their steering questions together should be the base of educators' implementation reflections. All the archetypes should be given equal consideration in order for the intended curriculum to be implemented efficiently. However, due to different curriculum implementation challenges at schools, the curricular archetypes are unevenly pulled and this might lead to a curriculum collapse in future. Therefore, CAPS may not be sustainable, practicable, consistent, and relevant. Thus, in this study, the curricular spider-web will be used as an archetypical model (conceptual framework). Educators' reflections on their practices of implementing the current curriculum will be explored through action research using the critical paradigm as a means to transform and improve teaching-learning processes.

2.6 Curricular archetypes

2.6.1 Rationale for being an Agricultural Sciences educator

One of the main challenges facing education arena in South Africa is having educators lacking understanding of curriculum, teaching and learning rationale (Khoza, 2015c). However, this is a global challenge which seems to be escalating and it must be addressed to reduce poor performances in schools (Khoza, 2015c, 2015d). The word rationale is simply defined by Van den Akker et al. (2009) as the fundamental reasons or logic behind executing a task. It is basically the justification for embarking into an activity. This suggests that educators should indicate the rationale as to why they teach Agricultural Sciences Curriculum.

Furthermore, a study conducted by Ennis (1994) examined the teaching decisions of eleven educators to determine their rationale and goals. The Rationale was based on educators' reflections and perceptions of student background, content relevance and motivation of students. The study by Ennis (1994, p. 1) reported that "Teachers' comments revealed a tension between the need to teach academic goals and the need to teach skills associated with social responsibility". There are many factors that motivate educators to pursue a teaching profession, these include the desire for personal development, continuous learning to have a significant contribution to others' lives and the society at large, and to have a stable job for monetary benefits (Mansfield et al., 2012). Studies conducted by Van den Akker et al. (2009); Van Manen (1977); Khoza (2015c) which focused on curriculum reform/s, visions/rationale and goals discovered and reported that rationale for implementing/enacting curriculum is divided into personal, societal (social) and discipline (content) rationale. Furthermore, Khoza (2015c) indicates that educators' experiences/practices, which induce a pragmatic rationalisation and reconstruct behaviour, forms part of the list as to why educators educate. This is an indication that the act of educators organising how they will educate agricultural sciences according to their experiences allows them to construct and reconstruct their approaches of implementing/enacting curriculum.

In addition, a case study that was conducted by Khoza (2015c) explored student educators' reflections on their practices of Curriculum and Assessment Policy Statement and focused on twenty-two postgraduate curriculum studies students. The study also determined the rationale

behind the student educators' implementation practices of CAPS. Khoza (2015c) used projects analysis, one-on-one semi-structured interviews and focus-group discussion to generate data where convenience sampling was used in most accessible students. The study discovered that educators' reflections and reasons to teach do not have any influence in designing the intended curriculum. Instead they are just copying CAPS instructions from the policy document to "defend and promote their subjects, which is the reflection that produces descriptive reflections as opposed to critical reflections" (Khoza, 2015c, p. 114).

On a study conducted by Mpungose (2016), it is said that personal rationale has a very significant role in attaining curriculum goals. Furthermore, it is reported that personal rationale assists educators to implement/enact any curriculum effortlessly and efficiently. This is because an educator will be able to identify his/her own strengths and weakness in relation to their broad vision of his/her career choice as an educator (Kehdinga, 2014a; Khoza, 2014; Taole, 2013). Reports from the above mentioned studies are aligned with a report by Fullan (1993) that indicates that educators have a variety of motives for becoming educators. Fullan (1993)'s study explored why educators must become change agents, and a random sample of 220 student-educators was done. The majority of participants' personal rationale was to make a significant difference in the lives of learners and to bring consciousness for them to value education. These reports suggest that some agricultural sciences educators may personally have motives to induce consciousness to learners to value agriculture as it is the main sector to fight against food insecurities, hunger, and unemployment in South Africa and the world at large. So basically, with a personal rationale, an educator can face any uncertain and unexpected situation during teaching-learning inside the classroom and school premises, because it encourages them to crucially appraise themselves, current attitudes, and the interaction with learners and staff members (Çimer et al., 2013).

Furthermore to the above-mentioned attributes of personal rationale, Ngubane-Mokiwa and Khoza (2016) conducted a case study on the experiences of lecturers in teaching Science, Technology, Engineering and Mathematics (STEM) subjects to students with disabilities in Technical and Vocational Education and Training (TVET). The nature of the study was mainly motivated by the scarcity of STEM lecturers in our communities. This suggests that

some educators may be agricultural sciences educators because of the scant involvement of youth on agricultural initiative in our communities (societal rationale). Ngubane-Mokiwa and Khoza (2016) seem to share the same sentiments with Kehdinga (2014a); Khoza (2014); Khoza (2015c); Thobega et al. (2011); Waithera (2013) that socio-economic factors, such as inadequate educators, and communities may influence the choices of those who are keen to be vehicles of transformation. Agricultural Sciences is more of a practical subject hence the main aim of implementing its curriculum is to produce skilled citizens to put what they've been taught in class on the ground and practice agriculture in their communities (Ochieng'-Konyango & Asienyo, 2015). The above-mentioned studies evidently give an idea about societal rationale that positions society at the heart of the teaching and learning environment. The learning environment is referred to as horizontal/competence curriculum where knowledge is gathered horizontally from known sources and learning influenced by local daily indigenous knowledge (Bernstein, 1999; Khoza, 2015d)

However, the issue of ploughing back to communities can never be overemphasised as one needs to transform their communities, irrespective of their fields of study. This was also proven by Kaminski, Switzer, and Gloeckner (2009) who conducted a study entitled "Workforce readiness: A study of university students' fluency with information technology" and reported that most of the students who were used to generate data indicated that technologically seems to be advancing. Therefore, one must be technological literate to be relevant in the modern society. Hence this also informs that some people pursue some qualifications for modern societal relevance. Meaning, the issue of urbanisation and eradicating value of soil, animals, plants and nature at large, in our societies, have motivated educators to educate agricultural sciences. This aids in regenerating the love of agriculture amongst society members for better livelihood, especially in rural areas where there is too much arable land (Agbulu & Ademu, 2010; Thobega et al., 2011; Waithera, 2013).

In addition to personal and societal rationale, educators need to be content (discipline) sound, as indicated by the Department of basic Education (2011) on the Agricultural Sciences Curriculum and Assessment Policy Statement (CAPS) document. Being content sound means that agricultural sciences educators must be knowledgeable of the content in order to promote skills-orientated education (Ndwandwe & Dlamini, 2013). In order to promote the skills-

orientated education, an educator must be qualified (content rationale) before standing in front of learners and transferring knowledge (Schimdt, 2012). Meaning that, a discipline or profession is put at the centre of the teaching and learning environment as a performance/ vertical curriculum (Bernstein, 1999; Khoza, 2015d). This suggests that educators should be properly trained and qualified to educate learners and be effective to attain curriculum aims. So some educators may not have any personal nor societal reasons to educate agricultural sciences, but do so because they are trained and qualified to be educators, and well knowledgeable about the subject matter. This is also proven by some of Khoza (2015c)'s participants who indicated that they did not have any specific personal rationales for being educators, except that they were just following instructions from the Department of Basic Education CAPS document of 2011. Therefore, in order to be competitive in education and reforming the nature of curriculum and how classroom instructions are implemented/enacted, educators need to sharpen their understanding of how qualifications matter to secondary school educators (Grossman & Stodolsky, 1995). When educators understand the importance of qualifications and skills, they may to reflect on their practices of agricultural sciences, and thrive to improve how they teach. Thus, the growth and development of any curriculum depends on how knowledgeable educators are, in their subjects.

Moreover, experiences promote critical thinking which fabricates critical reconstruction rationale (Khoza, 2015b; Schiro, 2013). Educators' consciousness and cognitive level is the centre of the teaching and learning environment. Agricultural Sciences educators may then have to always have to be critical thinkers in order to reflect on their practices, and in attempting to remedy social injustices. This is done in order to counteract the moral degradation for the betterment of human's spiritual, cultural and social well-being (Bernstein, 1999; Khoza, 2015d; Schiro, 2013; Van Manen, 1977).

Above all rationale, CAPS is silent about why (rationale) educators need to educate agricultural sciences in secondary schools, hence they should reflect on their rationale as to why they are agricultural sciences educators. Furthermore, studies mentioned above did not use action research to explore educators' rationale of implementing/enacting curriculum. For this reason, there is a need to conduct a study where data will also be generated through reflective activities and focus group discussion as well. Understanding rationale paves the

way to attain curriculum goals which are determined by aims, objectives and learning outcomes (Khoza, 2015d)

2.6.2 Educators' goal (Aims, objectives and learning outcomes)

Educational goals reflects diverse curricular value orientations (Ennis, 1994). The word goal is however defined by Khoza (2013b) as the state of affairs that a plan is intended to achieve and that, when achieved, terminates behaviour intended to achieve it. The goals justify the means of doing something. Furthermore, goals are divided into aim, objective and outcome (Kennedy et al., 2006). Aim is regarded as a long term intention based on educators' perception or standpoint, while objective as a short term intention with specific plan/steps to achieve a goal. Both aim and objective still indicate the intentions of an educator for the anticipated outcome from learners (Kennedy et al., 2006; Khoza, 2013b, 2015d; Mpungose, 2016). However, aim and objectives are given more power in performance/vertical curriculum (Hoadley & Jansen, 2013). Learning outcomes are therefore described by Khoza (2013b) as what the learners are expected to know, understand and be able to do at the end of the learning period. Meaning what it is hoped learners will learn. Outcomes are given more power in competence/horizontal curriculum (Bernstein, 1999).

Furthermore, it is very important, in any subject curriculum, to state the aims and objectives prior to implementation. This assists an educator to design the lesson content, methods, ways of assessing and identification of all resources needed to embark on the teaching and learning process (Khoza, 2015d). In a nutshell, this provides a basis for quality education assurance. As aim is a long term goal, it gives an educator a clear understanding of the broader purpose of educating Agricultural Sciences CAPS to learners. This entails what the education intends to cover at the end of a lesson or chapter or section (Kennedy et al., 2006). The significance of setting a precise aim when teaching a subject is declared, to be fundamental, by Khoza (2013b) who conducted a study on "Learning Outcomes as understood by Publishing Research facilitators at a South African university". Six facilitators were used in the study in which data were collected through document analysis and semi-structured interviews. From the study, it was divulged that learners can never achieve the intended outcomes if the aim is not clearly specified. This suggests that Agricultural Sciences CAPS educators should specify their aims as they are crucial to implement/enact the intended curriculum. Reflections of

agricultural sciences educators' on their teaching aims are imperative to improve how they execute their duties.

Furthermore, Berkvens et al. (2014) indicated that high quality curricula are based on broader goals and that what students will learn, understand, be able to do depend on those developed goals. Agricultural Sciences educators should not only aim at covering the entire intended curriculum, but also aim to develop skills, instil critical thinking and problem solving skills to learners. This moulds a learner to be competitive to the outside world, as they will also be competing at tertiary institutions, when seeking jobs and as well as at the work place. Moreover, others will embark on community agricultural initiatives where the skills learned at schools need to be applied. Thus, the aim of agricultural sciences educators should also entail broader intentions for learners to contribute in the upliftment of community livelihood (Agbulu & Ademu, 2010; Kabugi, 2013; Thobega et al., 2011; Waithera, 2013). In order to achieve the aim, one must point out some specific step towards reaching the aim. The specific steps of teaching intention are objectives, which collectively form the aim of teaching and learning.

In addition to the above, objectives play a very significant role in any teaching and learning process. This is affirmed by Khoza and Manik (2015) who conducted a study on digital technology experience of postgraduate students doing research at a South African university in the KwaZulu-Natal province. Students were selected using a purposive convenience sampling where instruments, such as handwritten and email communication, and their articulations (spoken and digital), were used to generate data. The study asserted that some of the students commented and said "they were forced to migrate to a digital world without the requisite support" (Khoza & Manik, 2015, p. 190). In simple terms; moving to the digital world was the aim, and the support students needed would be the specific step (objectives) to follow in order to attain the aim. Furthermore, Khoza and Manik (2015) refer to such students as 'digital technology refugee', as they seek refuge (help/assistance) in the strange world they find themselves into, without step-by-step (hierarchy) preparations to find comfort in the new digital world. This suggests that, educators should begin lessons by diagnosing what learners know so that teaching and learning start from the known to [the] unknown. The approach or style of gradually introducing complex theories from simple concepts should be promoted

and adopted from the Bloom's taxonomy (Berkvens et al., 2014; Kennedy et al., 2006; Khoza, 2013a, 2015d).
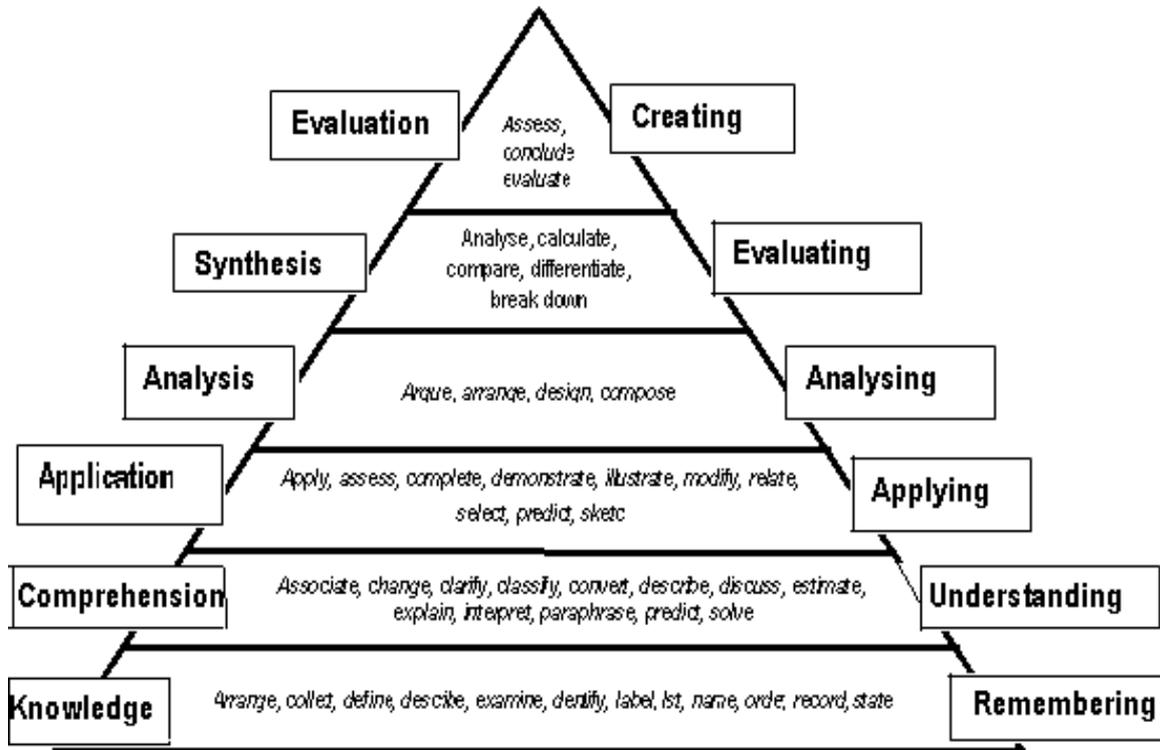
Figure 2.3: Benjamin Bloom Cognitive levels of learning outcomes and key words Khoza (2016)

Using Bloom's taxonomy (figure 2.3) may then allow an educator to move the lesson, even for assessment purposes, from low order knowledge to a higher order (Kennedy et al., 2006). This develops and arranges the thinking process in a hierarchy where the learner's ability to think at a particular level depends on the ability to perform at a lower level, Kennedy et al. (2006) reported. Therefore properly articulated aims and objectives make it easier for agricultural sciences educators to attain the learning outcomes. Kennedy et al. (2006) and Khoza (2013b) affirms this by reporting that learning outcomes are rooted on learners' perspectives if they understood and met the educator's aim and objectives of a particular subject/lesson/course/module. Thus, Kennedy et al. (2006, p. 5) came with a working definition that "Learning outcomes are statement of what a learner is expected to know, understand and/or be able to demonstrate after completion of a process of learning". Even

Berkvens et al. (2014) and Khoza (2013b) share the same view that learning outcomes are based on what has been grasped and understood by a learner after a lesson, and these are measureable or observed from each learner's performance. Bloom's taxonomy (figure 2.2) allows each educator to measure each learner based on the Hierarchy of cognitive domain levels, namely: 1. Knowledge, 2. Comprehension, 3. Application, 4. Analysis, 5 Synthesis and 6 Evaluation. Because of the learning experience, learning outcomes bring about a significant change in both educator and a learner (Khoza, 2014b; Watson, 2002). This suggests that after each and every lesson, Agricultural Sciences CAPS students should be able to know and explain what they did not know before the learning process took place. Knowing does not solely imply understanding the theory, but it well encompasses being able to demonstrate what they (learners) could not before the learning process.

Furthermore, outcomes were reported by Khoza (2013b) to be divided into Critical Outcomes (CO) and Learning Outcomes (LO). He further indicated that COs are very analogous to aims and objectives, as they are also broad and specific statements of teaching intention, while LOs are post learning measurable learners' performance. Learning is seen by Bond et al. (1985) as a process whereby outcomes ought to be achieved concluding in the success of both learners and educators. Learning is successful when learners are able to reflect on their learning based on what they have acquired. Reflection is easier for those who did not just memorise to pass, but understood every aspect of the teaching-learning process in order to be critical thinkers who solve problems confronting them in their lifetime (Barnes, 2002). Moreover, as learning outcomes are measured based on Bloom's (1975) assortments. Khoza (2013b) reveals that learning outcomes must be linked to lesson activities and assessment strategies because, if not, an educator will not be able to measure learners 'performance objectively. This means that learning outcomes are more important than aims and objectives in terms of measuring learners' performance for attained curriculum, as it would be difficult to precisely identify what the learner has to be able to know, demonstrate and articulate in order to master the subject (Kennedy et al., 2006; Waithera, 2013). Kennedy et al. (2006) add to this by mentioning that learning outcomes also clearly indicate how learners are able to demonstrate their achievements. Thus, they are more precise and easier to compose than aims and objectives. This then suggests that agricultural sciences educators have to establish the degree of excellence that has to be specified and have to ask themselves what the learners need to know, do, and understand in relation to what has to be taught. By so doing, educators

should decide which teaching methods, as well as resources they are going to utilise to construct their lessons. This may assist in attaining the desired outcomes for the intended and implemented curriculum.

The importance of learning outcomes is understated in the discussion of the key curricular archetypes (spider-web concepts), by Van den Akker et al. (2009). This is argued by Mpungose (2016) when he observed that learning outcomes are not included as the proposition when goals are discussed. This means that, since learning outcomes are not addressed adequately, the spider-web does not cover all concepts to evaluate the curriculum yet learning outcomes play a significant role in the teaching and learning process. This suggests that agricultural sciences educators should be able to seriously reflect on their learning outcomes. Learning outcomes should be taken as a central goal even if it is not significantly recognised in the curriculum spider-web. The Agricultural Sciences CAPS (2011) document specifies South Africa's general aims of the curriculum where the policy document states that, it "…gives expression to the knowledge, skills and values worth learning in South African schools. This curriculum aims to ensure that children acquire and apply knowledge and skills in ways that are meaningful to their own lives. In this regards, the curriculum promotes knowledge in local contexts, while being sensitive to global imperative" (Education, 2011, p. 4). Furthermore, the policy document aims to produce learners that are able to identify and solve problems and make decisions using critical and creative thinking. However, the policy document (CAPS, 2011) fails to address specific aims and objectives of agricultural sciences educators' intentions (aims), including the activities when implementing/enacting a specific topic inside classrooms. In addition to this, CAPS does not have specific learning outcomes for Agricultural Sciences CAPS. This suggests that, there should be specific learning outcomes for each grade (Grade 10 - 12) because each the syllabus is different in each grade, and general goals may confuse educators. It is then evident that intended, implemented and attained learning outcomes are missing from South African Curriculum and Assessment Policy Statement. For this reason, agricultural sciences education should be well aware of the learning outcomes and should reflect on them, even though it might be easy since they are not stated by the policy documents. The goal of any curriculum is rooted on the aims, objective and learning outcomes, and goals' attainability depends on the classroom teaching activities (Kennedy et al., 2006; Khoza, 2013b; Mansfield et al., 2012).

2.6.3 Teaching and learning activities for Agricultural Sciences

Learning as an act of developing knowledge and skills, and moulding values/attitudes, is viewed at a two dimensional position. Learning is a function of selecting signals and is a function of avoiding noise, mainly inside classrooms (Khoza, 2015d). Signal being the important activities of learning and noise being those activities that disturb learning (Johnstone & Letton, 1991; Khoza, 2015d). Educators are the ones who drive the learning processes as they introduce and facilitates all teaching and learning activities (Kennedy et al., 2006). Classroom activities and learners' experiences are what is needed in order for learning to be deemed as such as they facilitate the outcomes and behavioural competencies (Mpungose, 2016). It is therefore indicated by Haladyna, Downing, and Rodriguez (2002) that teaching/learning activities need to be clearly formulated with valid guidelines to help educators better assess the complex learning progress of learners. This allows an educator to recognise the need to teach and assess knowledge, skills and abilities. Thus, all classroom activities should be rooted on assessment activities because it is a vigorous part of effective teaching and successful learning (Chappuis & Stiggins, 2002).

Furthermore, a study conducted by Turner and Patric (2004) focused on how student classroom participation, in relation to a combination of both student factors and features of the classroom context, affect learning. Student factors included personal achievement goals, perception of classroom goal structure, and educator support, while features of the classroom context included educators' instructional practices, average perceptions of classroom goal structure. Twenty-one students/learners were assessed. Differential educator expectations, instructional and motivational support interacted with beliefs and behaviours of learner participation. Surveys, where a point-5 scale, were used. Results from the study revealed that students' classroom participation is imperative in developing students' cognitive level and attaining teaching and learning outcomes. Students who participated with enthusiasm on informal and formal classroom discussions demonstrated high concern on how they perform during assessment. Turner and Patric (2004) add by indicating that assessing students through discussions (informal formative assessment) triggered excitement in students as they learn new skills or knowledge. However, those who were less active were not performing well even during examinations (both mid-year and final year). This suggests that educators should not focus only on written tasks to assess learners, but also engage learners in activities like

discussions, debates, and abstract analysis so that learners can learn from each other, while educators facilitate the activities.

Moreover, CAPS (2011) suggests that teaching/learning activities should be based on processing formative (informal), interval summative (formal) and continuous assessment. Mpungose (2016) asserts that there are three types of assessment activities educators employ in classrooms to engage their learners. These include informal assessment activities, formal assessment activities and continuous assessment activities. He further asserts that, because informal assessment activities include all activities, diagnostic, and remedial, done by both educators and learners during teaching and learning, they (activities) should be regarded as activities for learning. These activities have massive significance in updating the educator on learners' progress and where learners need some polishing up. Formal assessment activities are viewed as activities of learning because they are given to learners at the end of each teaching and learning programme to validate if the learning outcomes are achieved by learners Khoza (2015b). At the end of each term continuous assessment (CASS) is done, in which at the end of the whole programme or year, the average percentage of all the formal tasks given to learners will be combined to determine if learners are progressing to the next level or not (Khoza, 2015b; Mpungose, 2016). In this regard, educators reflecting on teaching and learning activities in terms of when, how, and why they use these activities, might help to bring and understanding on which activities to be employed and for what purpose. In addition to this, no intended learning outcomes can ever be attained without understanding and mastering the learning activities and how to assess learners (Temur, 2007).

Temur (2007) conducted a study which revealed that teaching activities which are designed according to the Multiple Intelligence Theory have an impact on the students' success in mathematics, on the performance of the learned knowledge and cognitive level in general. The study was carried out using Grade 4 learners at Gazi University Foundation Private Primary School. Two classes (Grade 4 A and B) were selected where A was used as an experimental group while B as a control group. A pre-test was given where all participants seemed to perform uniformly. The experimental group was active and was engaging into discussions/debates, and was given some informal formative assessment activities (homework and class work) based on the intended outcomes for the research. The control

group was just passive and with no remedial activities given to them. A post-test was given where the average of the final test points were analysed based on the Multiple intelligence Theory. The results revealed that assessment activities had positive effects on the mathematic achievement of primary school fourth grade learners. Meaningful differences between learner achievement scores were detected in favour of the experimental group. Furthermore, Khoza (2015d); Temur (2007); Turner and Patric (2004) share the same view that when students/learners actively participate in lessons, their interest level rose with rich activities were performed. This makes them more aware of their abilities, thus proper understanding and employment of teaching/learning activities developed each learner's intelligence domain. Temur (2007) reported that, at the end of the lesson, learners reflected and stated that they could not really understand when the lesson began, but then ended comprehending the lesson well. They further stated that the classroom activities, tools and materials used assisted in improving learners' problem-solving and critical thinking skills. The researched concluded that the learners who were in the experimental group could do some activities independently, and with improved leadership skills compared to their counterpart control group members. This suggests that educators should continue doing the informal tasks/activities such as homework, class work, presentations, and tests. These activities are the most significant to keep track of learners' progress as educators move further with the syllabus. Remedial actions could be easily done on these short pieces of activities for learners to attain the desired outcomes (Kennedy et al., 2006; King-McKenzi et al., 2013).

However, Hoadley and Jansen (2013) reported that it is the formal activities which have more significance in learners' progress more than the informal ones. In addition, formal activities are marked and recorded for reporting and certification purposes. Khoza (2016) further states that, for promotion purposes, informal assessments add no value, but the formal ones since they (informal activities) are not moderated for quality assurance, as stipulated by CAPS (2011). Mpungose (2016) suggests that the School Management Team (SMT) should moderate all formal tasks before (pre-moderation) given to learners/students and after (post-moderation) learners have submitted and educators have marked the scripts. This suggests that agricultural sciences educators should, at a cluster level, design/formulate formal activities such as tests, practical investigations, assignments, projects and examinations to be done in each term. These activities should be recorded in order for subject advisors to moderate, and also parents to see the progress of their learners.

Additionally, classroom teaching-learning activities should be formulated to cover questions which will allow learners to process those questions and their answers on all levels of Bloom's domains of learning (Khoza, 2013b). To be able to attain all these levels, an educator should employ learner-centred approach during lessons. Learner-centred lessons allow technical competences in classrooms, and inculcate appropriate attitude in both educators and learners towards the assessment activities as they are active participants (Harden, 2002a, 2002b; Harden & Crosby, 2000). However, Anderson and Elloumi (2004) asserted that there are three approaches in learning; namely teacher-centred, learner-centred and content-centred, and all three of them should be used according to their potency or effectiveness. Furthermore, Anderson and Elloumi (2004) indicated that none of these approaches should be employed exclusively. Khoza (2013b) mentions that for an effective approach to presentation, teacher-centred approach (behaviourism) should be used by educators, while content-centred approach (cognitivism) used to measure any piece of content to be given to learners. Lastly, the learner-centred approach (constructivism) should be used when educators want contextualised learning activities. Therefore, this clearly means that there should be a strong link between measurable or observable learning outcomes, and lesson activities or assessment activities. Also, assessment activities should be seen by learners as having real-world relevance (Khoza, 2013b). However, linking learning assessment activities with learning outcomes is still a huge challenge for most educators, Taole (2013) reported. Hence sometimes there are curriculum backlog (failure), implementation or enactment difficulties and less competitiveness in learners when they go to various tertiary educational disciplines (Mpungose, 2016). This suggests that workshops/trainings for educators should also focus on how best they can master teaching-learning activities. Meaning that, educator support programmes for agricultural sciences, and other subjects, should not only focus on content knowledge but also on employment of teaching-learning activities. Therefore it is pivotal for educators to reflect on learning activities they employ during teaching and learning.

In addition to the above, technology integration in schools is growing and learners need to be computer literate in order to move with the flow of learning activities (Khoza, 2012, 2013a, 2015a, 2015b; Khoza & Manik, 2015). A case study done by Khoza (2012) explored

reflections of one facilitator who uses online resources with eight post-graduate students in teaching a Curriculum module at one of the universities in South Africa. Online chat, discussion forums, Facebook, and blogs are used by the facilitator to learn (blended learning) with his students. For data production, (Khoza, 2012) used a guided analysis theory as a framework. Online document analysis, semi-structured interviews and observation were used for generating data. Khoza (2012) reports that the facilitator claimed that these online resources promoted active students during teaching and learning because they were not learning from these online resources, but with these online resources. The study concludes that educators who use technology as part of their lessons' activities should be able to promote active participation and allow learners to best use these tools without discrimination. It is also important to note how these online tools are used because "learning activity principle is about the how of teaching/learning" (Khoza, 2013a, p. 55). So, educators, as facilitators of teaching and learning process, should decide and guide learners to which activities to do in order to attain the learning outcomes.

Therefore, educators should be well equipped to use different approaches (teacher-centred, content-centred, and learner-centred approach) during teaching and learning activities, as elaborated by the literature above. All learning activities employed should be aligned with the learning outcomes. Learning outcomes are measured based on informal, formal and continuous assessment activities during lessons. Educators are therefore playing a significant role in assisting learners in the execution of learning activities anticipated by the curriculum. Therefore, agricultural sciences educators' reflections on teaching-learning activities are important for educators to understand why, how, and what activities are required to successfully attain curriculum aims and positive learning outcomes. However, teaching activities are formulated based on the content an educator needs to instil in order for learners to know and understand the subject matter (Ochieng'-Konyango & Asienyo, 2015).

2.6.4 Agricultural Sciences content
When the government of any country approves the curriculum to be used in basic education and training, there is a significant recognition of skills-orientated education to address the problems of incompetent students, unemployment, and unemployability (Ndwandwe & Dlamini, 2013). Curriculum reform has stipulated that in essence, effective implementation of

curriculum should be learner-centred, even though Anderson and Elloumi (2004) in the previous section (learning activities) outlined the significance of teacher-centred and content-centred approaches for effective learning. However, on the other hand, the approach to be used is determined by the subject content (Hoadley & Jansen, 2013; Ochieng'-Konyango & Asienyo, 2015) to be covered as prescribed by CAPS. The accomplishment of educational innovations, largely depends on the skills and content knowledge of educators (Agbulu & Ademu, 2010). Furthermore, implementation of enquiry-based teaching requires an educator to be well knowledgeable about the content in order for the educator to move from known to unknown knowledge when delivering the content (Keys & Bryan, 2001). No curriculum implementation can ever be successful if implementers (educators) are not well knowledgeable. Furthermore, educators are the primary source of knowledge for learners (Berkvens et al., 2014; Hoadley & Jansen, 2013; Ochieng'-Konyango & Asienyo, 2015). The content should be segregated and sorted according to topics (Berkvens et al., 2014; Fullan, 1993).

The above literature suggests that agricultural sciences educators must possess subject knowledge and understand all topics to be covered as per the intended curriculum. The "what" part in transferring of knowledge to learners is key for educators to be able to come to the "how" and "when" parts. Hence, an approach to teaching depends largely on the magnitude of content one has. Therefore, what an educator knows should be organised based on the topics to be covered. Additionally, Boone et al. (2006); Kabugi (2013); Thobega et al. (2011) and Waithera (2013), have indicated that agricultural education has been in existence even long before our nomadic ancestors consistently settled and farmed. That was before agricultural education was even recoded in books to be taught formally in schools. This makes agriculture an inborn essence of human kind and it should not only be classroom-based but also practiced outside classrooms. Thus, educators need to be knowledgeable of its content and its practices to instil not only understanding, but love and enthusiasm into learners learning agricultural sciences.

Furthermore, a qualitative study conducted by Ochieng'-Konyango and Asienyo (2015) documented, examined, describes, analysed, and interpreted how the participatory curriculum implementation strategies with content have shaped school agriculture. The purpose of the

study was to determine why school agriculture had not made an impact on the practical aspects of the subject. One hundred and seventy-four current and former agricultural sciences educators, including subject heads, current and former agricultural sciences education officials (advisors). Forty-six schools were selected and data were generated using document analysis, visits to archives and questionnaires, and interviews. Ochieng'-Konyango and Asienyo (2015) reported that the status of the subject does not reflect the coverage of scientific and practical standards of school agricultural sciences but the materialisation of theoretical teaching and learning of the subject contrary to the expectations. This assertion agrees with the one by Thobega et al. (2011), who conducted a descriptive survey study to identify curriculum related factors that affect how Agricultural Sciences educators educate in secondary schools. Thobega et al. (2011) asserted that agricultural sciences is a practical subject and its content cannot solely be based on theory. Unlike other subjects, the agricultural sciences subject needs also to include working with livestock, soil, and crops outside the classroom, in school gardens and farms. This suggests that practical experiments go hand-in-in hand with the content to be covered as practical experiments develop skills and the cognitive level of learners, and to some extent of educators as well. Additionally, content covered should include practical work designed to invoke learners use of critical skills such as observing, remembering, planning, data collecting, data analysing, synthesising, evaluating and concluding. Thus, agricultural educators should include practical work when implementing/enacting curriculum.

Moreover, Mbajiorgu et al. (2014), conducted a survey study at Mandlethu FET School in Mpumalanga Province of South Africa. The study determined factors affecting teaching and learning of Agricultural Sciences at the school. Both learners and educators reflected through face-to-face interviews and questionnaires. Among other factors, the study identified that adequate implementation of Agricultural Sciences curriculum (content) is also hindered by poor skills and teaching approaches by educators, poor social skills, and a lack of resources like study materials and libraries. Mbajiorgu et al. (2014) also reported that, learners mentioned educators' poor attendance of classes which in turn resulted some content not covered when final examinations are written. Given that Boone et al. (2006); Kabugi (2013); Ochieng'-Konyango and Asienyo (2015) and Thobega et al. (2011), have clearly asserted that agriculture has been practiced by our ancestors, grandparents and parents at our homesteads, there is a need to get support from organic intellectuals (our parents) in explaining some

concepts taught in classroom. Sadly, some parents do not give support to their children when they are given assignments and homework to be done after school (Mbajiorgu et al., 2014). The studies mentioned above suggest that educators should not be the only source of information/knowledge to learners. Parents should also be part and parcel of the subject because the agricultural scientific knowledge taught at schools is derived from traditional knowledge practiced at home. So, scientific intellectuals (educators) should be assisted by organic intellectuals (parents) for agricultural sciences content to make sense and develop skills in learners.

However, content knowledgeableness of educators can never be overemphasised in view of the fact that education starts with an educator knowing all components/topics of the subject because educators are scholars as well (Hoadley & Jansen, 2013). Teaching Curriculum and Assessment Policy statement (CAPS) can be overwhelming as it requires one to possess also technical knowhow to attain the intended curriculum (Czerniewincz & Brown, 2014). Khoza (2014a) states that the content (intended curriculum) drafted at national (MACRO) level needs to be attained mainly at classroom (MICRO) level, and for its attainment, the Department of Basic Education, together with school management teams and parents need to provide maximum support to educators. Furthermore, Khoza (2016) agrees with this as he indicated that the powerlessness of connecting content prescribed in the Annual Teaching Plan (ATP) and its feasibility, in schools, has injurious effects on teaching and learning, Khoza (2016) adds that this ends up resulting in curriculum backlog. This means both content and curriculum awareness are vital for educators to possess because content knowledge involves content knowledgeableness and its construction, whereas curricular awareness entails the teaching a subject's programmes (Shulman, 1987).

However, CAPS (2012) has not yet addressed, in Agricultural Sciences subject, the issue of rural wealth creation and globalisation, as it was suggested by the Department of Agriculture, Forestry and Fisheries (DAFF, 2008), long before even CAPS (2012) was implemented. Also, issues of Land Reform Management, Water Harvesting techniques, except rainwater harvesting, are still not yet well addressed in senior secondary school agricultural science subject. DAFF (2008) Chapter 5 of the summary report entitled "Evaluation of Agricultural Education and Training Curricula in South Africa" reported that English language

proficiency amongst countless number of black students/learners was identified as the most important moderator of performance and the largest factor responsible for students/learners failing to understand the content. And those in FET and tertiary institutions fail to complete their studies in the minimum duration. DAFF (2008) suggested that there should be vigorous and rigorous comprehensive team work amongst educators to enforce the use of English as it the language of instructions in all education levels. Among other things, poor agricultural content knowledge and practical knowhow at secondary school level hinder progress of learners at tertiary level. Poor content and skills development are "a result of a lack of good teachers, poor laboratory facilities, etc" (DAFF, 2008, p. 6). This indicates that sometimes during teaching and learning, language can be a barrier especially in public schools. In other words, some sections of the content are simple but because of the language, it's difficult for learners to understand. Therefore, all educators, not only agricultural science educators, should train learners even at lower grades to use English during lessons. The government should monitor also primary schools and not only focus on high schools, to see how subjects' content is delivered and assessed by educators. A house with a weak foundation will collapse when the roof is installed, meaning if primary schools are not monitored, that puts a strain on secondary school educators to make learners understand the content.

Moreover, agricultural sciences content also covers some topics/principles of life sciences, physical sciences and business studies, such as genetics, zoology, chemistry, biotechnology, agricultural economics and management or agribusiness (Connors & Elliot, 1996; DAFF, 2008; Kabugi, 2013; Ochieng'-Konyango & Asienyo, 2015; Waithera, 2013). An argument by Boone et al. (2006) about the inclusion of biotechnology and chemistry in the content of agricultural sciences raised questions like; did agricultural sciences educators have the proper knowledge, understanding and attitudes about biotechnology and chemistry to properly implement/enact the concepts/content into the high school curriculum? However, biotechnology and chemistry are among the most complex and widely applied innovations of our life time (Boone et al., 2006). The inclusion of the above-mentioned content in secondary schools Agricultural Sciences Curriculum also rose concerns which are reported by Wilson, Kirby, and Flowers (2002) who discovered how agricultural sciences educators felt about the inclusion of biotechnology and genetics in agricultural sciences content. Wilson et al. (2002) reported that educators lacked biotechnology and genetics knowledge. However, they do recognise the significance but they were not trained on those topics even though they had to

educate learners on such content. CAPS (2012) also integrated these topic and educators who have less years of teaching experience are more likely to understand and know biotechnology, genetics, chemistry since they might have attended some training classes, as opposed to those who have been teaching for more that fifteen years and have served during the old apartheid regime (Kabugi, 2013; Mbajiorgu et al., 2014; Ochieng'-Konyango & Asienyo, 2015). This suggests that content workshops should be organised to assist educators who find themselves implementing topic they do not understand and never had training on them.

However, integrating content from other disciplines is significant as it broadens the mind set of learners and equips them for the modern life we are living in (Berkvens et al., 2014). Furthermore to this, Mpungose (2016, p. 50) asserted "any curriculum should address aspects such as relevance, consistency, practicality and sustainability in order to address the quality of the curriculum". This means that any content drafted in a curriculum to be taught to learners should be capacitating learners for societal demands, future education and work/job market. However, thus far CAPS (2012) has not yet stated the material and resources to be used in practical work. CAPS, as an instrumental curriculum, does not cater for schools without resources, as a result focus is more on theory than practical, which deviates from the aim of technical skills development. Thus, some learners who come from less resourced schools struggle to be competitive in tertiary institutions and workplace. This therefore, suggests that with the challenges pertaining content taught and how it is taught, educators should clearly understand their roles as agricultural sciences transformers in schools.

2.6.5 Agricultural Sciences educator's roles

A study conducted by Cothran and Ennis (1997) examined four high school educators situated in an urban area on their reflections on their roles and power related matters inside classrooms. In the study, the educators reported that they felt their power had eroded, starting from policy development up to maintaining order in schools. Educators' work is personally demanding and emotionally overwhelming, their role is so neglected in educational policy and educator standards (Klate, 2008). The study conducted by Klate (2008) was a qualitative interpretive study and based on secondary school educators' professional identities and emotional experiences. The study also indicated that the day-to-day life experiences of

educators have a major impact on how educators perform their roles inside and outside classrooms. Exceptional quality implementation and enactment of all educational reforms necessitate each and every educator to engage in high quality professional learning. However, if educators have not had the chances to acquire appropriate skills and knowledge, new initiatives may be implemented or enacted poorly (Askell-Williams & Murray-Harvey, 2013).

Before an educator enters a classroom, they must be prepared to educate for conceptual understanding and to create classroom communities where learners will actively participate in the teaching and learning process (Borko & Mayfield, 1995). This means that educators play a significant role in setting a conducive and favourable atmosphere for learners to learn (Hoadley & Jansen, 2013). Ben-Peretz, Mendelsona, and Kronb (2003, p. 277) further made it clear that, "All students deserve equal opportunities to develop their full potential as human beings and as learners. Teachers play a central role in providing these opportunities". However, in black schools educators don't only struggle to make sense of the content, but also struggle to make sense in the use of English as a medium of instructions in classrooms (Yoon, 2008). This is in agreement with assertion by Valli and Buese (2007) that every educator, irrespective of the subject they teach, is a language educator. This suggests that, agricultural sciences educators' role in the classroom should not only focus on teaching the subject matter, but also encouraging learners to use English correctly in order to be fluent in the language. This encourages learners to be competitive in the outside world as it improves public speaking skills and boosts their confidence in the use of the language. So this reminds us that "teachers' roles should extend to include students' cultural and social need" (Yoon, 2008), and the accomplishment of any academic innovation depends predominantly on the skills and role played by educators (Agbulu & Ademu, 2010).

Furthermore, besides the fact that any educator is a language educator, they also play an elementary role in the decision-making process inside classrooms (Wahlstrom & Louis, 2008), even though their role is shallow with regards to policy making and school-based decision-making process (Mohamed, 2011). In addition to this, an educators as a decision maker is a role model, a mentor, an advisor and guide (Hennissen, Crasborn, Brouwer, Korthagen, & Bergen, 2008). With regards to classroom curriculum management, the

educators' role is to instruct when employing teacher-centred approach, to facilitate teaching and learning when employing learner-centred approach and assess during content-centred approach (Khoza, 2013a, 2015c). It is therefore of paramount importance for educators to understand these approaches to decide which one to employ during their lessons in order to bridge intended and implemented/enacted curriculum (Berkvens et al., 2014; Hoadley & Jansen, 2013). These studies concur with a study by Anderson and Elloumi (2004) that explains that simultaneously adjusting from one approach to the other, depending on the intended learning outcomes, is an educators' role and requires skills and understanding the lesson's goals.

The above suggests that for driving transformation, a healthy classroom environment, and attainment of the intended curriculum, an educator should be conscious about these approaches. Consciousness allows one to be strategic when solving problems arising which could result in noise and disturbance during teaching and learning (Khoza, 2015d). It is therefore an educator's role to prevent and control noise during lessons. An interpretive case study done by Khoza (2015d) entitled "*Using curricular spider web to explore a research facilitator's and students' experiences*" further emphasised the role played by facilitators/educators in avoiding noise or distraction in learning. He also indicated that noise is caused by the improper use of teaching/learning resources, as well as using inappropriate approaches at inappropriate time. Van den Akker et al. (2009) concur with the report by Khoza (2015d), by further stating that educators should trigger curiosity to keep learners motivated in order for them not to cause distractions. The minimal the distractions, the more the learning outcomes can be attained. During classroom discussions or debates where the role of an educator is to just facilitate the learner-centred environment, knowledge construction and reconstruction is guided by the educator. This is not to allow noise which could drag the discussion away from the subject matter (Khoza, 2015d; Turner & Patric, 2004; Veronesi & Varrella, 1999; Wilson et al., 2002). Such an active learning environment, created by an educator, allows inter-transferring of knowledge between learners, whilst the educator is also correcting and simplifying some concepts. This suggests that agricultural sciences educators should promote the culture of team learning where learners learn from each other than the educator being the only source of information/knowledge.

Additionally, the above authors share the same sentiments with Webb (2009) who uncovered multiple dimensions of the educator's role in nurturing beneficial group dialogues/debates/discussions, including preparing students for collaborative work, structuring groups, structuring group-work tasks, and influencing learners' interaction through educators' discourse with small groups and with the class. Webb (2009) worked on a research review paper with the aim was to explore the role of the educator in promoting learning in small groups. Studies chosen for the review focused on student-led small-group contexts for learning in which students were expected to collaborate, report data from systematic observations of group work, and like observational data to educator practices and student learning outcomes. The most common conclusive trend which was the significance of educator strategies and practices that promote student elaboration of ideas, and the cross-transferring of knowledge between learners in a team, as was also uncovered by Khoza (2015d); Turner and Patric (2004) & Wilson et al. (2002). Furthermore, CAPS (2012) also encourages this culture of learning by stating that educators should not be more active than learners during teaching and learning, as this would encourage learners/students to construct their own ideas of learning (constructivism) (Hoadley & Jansen, 2013).

However, the educator's role does not end only inside classrooms but also outside classrooms as they control and manage school activities such as extracurricular activities like sports, debates, music and other entertainment events for learners (Harrison & Killion, 2007). This indicates that the success of both the learner and the school is primarily on the hands of the educator. This means that, educators are a backbone of curriculum success. Furthermore, their roles, whether assigned formally or informally, build the entire school's capacity to improve. Harrison and Killion (2007, p. 74) further states that, " Because teachers can lead in a variety of ways, many teachers can serve as leaders among their peers". Wahlstrom and Louis (2008) define this kind of leaderships as educators' influence and participation in school decisions. However, CAPS (2012) does not clearly state how educators need to role-play in school management processes, though supportive interactions might enable educators to efficiently assume various role as mentor, coach, specialist and even advisor with one another. This shows that the majority of educators have the necessary energy, knowledge, and educational experience, and thus this suggests that the educations systems should utilise their efforts to improve the quality of education. This can be done by giving educators a larger voice (role) in the school decision-making process, where they will be able to make changes

and create a culture of collaborative working. If this energy and enthusiasm of educators could be used as an agent of transformation through collaborative culture building, schools can be transformed from being principal-led to schools led my many (Mohamed, 2011).

The above literature reveals that, allowing educators to reflect on their roles could be a significant move towards transforming school/educational systems. The literature further outlines the significant role of educators in creating a conducive environment for proper implementation/enactment during teaching and learning. It is evident that educators are not only learning mediators, designers of classroom learning programmes, and subject specialists to attain the intended curriculum, but also leaders/managers, role models and citizens who are vehicles of transformation, as they are moulding future leaders. However, for Agricultural Sciences CAPS educators to entirely play their role, there have to be teaching and learning resources so that their abilities are not hindered. Moreover, educators need to be creative in order to incorporate what they see as practicable and important to learners. This suggests that artistic and pragmatic approach should be applied in classrooms, even if there is a formal hierarchy of policies to be employed. Lastly, the Department of Education [at a provincial level] should organise workshops to empower educators with necessary skills to deal with curriculum changes made at national level, because at times, the policies developed (instrumental curriculum approach) at national are disconnected from reality that takes place at school level (Eisner, 1979; Freire, 2005; Stenhouse, 1975).

2.6.6 Resources used to teach Agricultural Sciences
Effectiveness of any lesson, in any field/discipline, is determined by the amount and quality of resources available (Thobega et al., 2011). Resources don't only assist in knowledge delivery, but in triggering interests of learners/students to the subject/lesson (Khoza, 2010; Van den Akker et al., 2009; Waithera, 2013). A teaching/learning resource is defined by Khoza (2012) as any object used to facilitate and aid learning. However, educators as people who also facilitate learning are also viewed by Khoza (2012) as the most powerful resource because the ideology and approach to teaching an educator employs during a lessons determines the use of the tangible objects and soft-ware resources. Thus, educators are the most powerful resource in education. Furthermore, this means that resources in education do not only encompass the visible and moveable objects, as assumed by most people (Recker,

Dorward, & Nelson, 2004). So, teaching/ learning visions and goals are influenced by many different ideological-ware (ideology/theories) resources (Khoza, 2015c, 2015d).

Moreover, a case study conducted by Ahamed, Clark-Wilson, and Oldknow (2004), which focused on how teaching aids can improve the quality of mathematics education, unveiled that the interplay among and connection between objects (hard-ware), symbols (soft-ware) and language/mathematical-reasoning (ideological-ware) is key in improving mathematics education. The study however, also reported that the slight distinction between the way mathematical ideas are constructed from objects and the particular description of the objects is often unclear in many educators' minds. This suggests that Agricultural Sciences CAPS educators' understanding of the resources to use and the message the resources need to convey/communicate to learners/students is pivotal for the effective use of resources.

Educating/teaching is communication, and in an effective communication in education there are three important aspects; the person (educator) sending the message/information/ knowledge, the message/information (subject-content) that is passed or to be passed, and the receiver (learner) (Asokhia, 2009). For effective teaching and learning, information must be decode appropriately, if not knowledge becomes distorted. Therefore educators should be able to properly use resources when teaching, and if resources are absent or inadequate, they should improvise to make learning easy, enjoyable and permanent (Ibeneme, 2000; Kehdinga, 2014b). So this means in an event where the school principals don't provide adequate hard-ware and soft-ware resources, Agricultural Sciences CAPS educators need to organise their own compilation such as text books, teaching guides, and posters/charts with diagrams, internet access, and computer. These are day-to-day resources which drive curriculum and which Van den Akker et al. (2009) refer to as curriculum carriers. Thus, educators need to reflect on the usage of these forms of resources in the teaching of agricultural sciences, and their absence or inadequacy may lead to poor implementation/ enactment, curriculum backlog and high failure rate. Some of those who pass may only pass because they crammed for the exam, not because they understood the content.

Additionally on the types of teaching/learning resources, Khoza (2013a) mentions three types of teaching and learning resources. The first resource is hard-ware resources which encompass any tangible object or tool or machine used to assist/ease teaching and learning. Secondly, soft-ware resources, which are visual aids/material used together with hard-ware-resources to display information/data; and thirdly, the ideological-ware resource which are not visible and also not tangible, but employed in classrooms by educators during teaching and learning. An ideological-ware resource is the teaching method/approach such as teacher-centred, content-centred and learner-centred approach. These above-mentioned resources identified by Khoza (2013a) in an interpretive study on university lectures who use online environment in teaching their modules, are the ones which communicate learning in all levels of education. However, they (resources) may be different from one educator to the other, and from a school/institution to the other depending on availability, skills and the working environment. The study asserts that the use of hard-ware and soft-ware resources depends on the ideological-ware resource. Hence even Khoza (2015c) reported that it is a central resource that drives forward the teaching and learning process in education, contrary to what most people view resource/s as only hard-ware and soft-ware or visual and tangible aids. This suggests that the mind-set of agricultural sciences educators, (as in how they view their work, and how they practice or execute (implement/enact) their duties) is imperative to be understood, in order to attain positive educational goals. Thus, agricultural sciences educators' reflections on the resources they use would allow educators to also understand which resource to employ, at what time and for what purpose.

However, the use of hard-ware and soft-ware resources in teaching and learning leads to higher learning interests (Gilakjani, 2012; Mayer, 2001). A review study done by Gilakjani (2012) on the role played by multimedia resource in motivating English first additional language learners' interests in 'English language learning', referred to soft-ware resource as multimedia. Gilakjani (2012, p. 57) defines multimedia as, "any computer-mediated soft-ware or interactive application that integrates text, colour, graphical images, animation, audio sound and full motion video in a single application". A soft-ware resource provides a complex multi-sensory experience in exploring the outside world through such a presentation of information (Mayer, 2001). The review further states that soft-ware in combination with hard-ware resource offer a prospective setting for improving student understanding about the language. Also, educators incorporate multimedia technologies to effectively create better

foreign language teaching and teaching/learning environments. Gilakjani (2012) share the same views with Mayer (2001) and Nakpodia (2013) that a mixture of words with pictures and videos has an ability of integrating large amounts of information, as compared to using a single medium (words only). Hence, multimedia resources improve memory, encourage active processing and present more information at once. Students learn best by seeing and listening more than just solely listening (Gilakjani, 2012; Khoza, 2013a; Mayer, 2001; Recker et al., 2004).

However, in some schools, soft-ware resources, such as overhead projectors and computers to show visuals like notes, pictures, illustrations, videos and voice clips, are absent whereas textbooks and chalkboards are very limited. Inadequacy and absence of teaching and learning resources put a lot strain on educators and education as well, and this demotes teaching and learning (Mbajiorgu et al., 2014; Thobega et al., 2011; Wilson et al., 2002). Department of education officials (Directors, managers and ministers) should work with school principals to try to provide at least the basic hard-ware resources such as textbooks, guides, and chalkboards in order for educators to effectively teach their subjects (Mpungose, 2016; Nakpodia, 2013). More to this, a qualitative case study conducted by Kehdinga (2014b) on eight student teachers' experiences within the context of curriculum transformation in a KwaZulu-Natal university, identified educators as core resources in education. From the semi-structured interviews and document analysis used to gather data, it is revealed that educators are curriculum transformers, meaning that they are change catalysts. Their ideologies in implementing/enacting Agricultural Sciences curriculum play a major role in development of the subject.

Furthermore, most studies discussed above, did not explore educators' reflections on their practices of agricultural sciences resources and most used data analysis, semi-structured interview and observation to generate data. Therefore, there is a need to address educators' reflections using a critical paradigm in an action research with reflective activities as part of data generation. This may enlighten educators with a better understanding on appropriate use of resources and also reflections may bring in-depth information about their experiences of implementing Agricultural Sciences curriculum. Furthermore, a good quality education which is driven by resources, as stated above, has to be accessible.

2.6.7 Accessibility of Agricultural Sciences teaching

The transition in South Africa to democracy has been marked by a number of challenges. Because of the noticeable inequality in education during the apartheid era, the foremost mandate of the post-apartheid government has been the provision of universal, equal access to good quality education and equal rights for all (Motala, 2001). Thus, Spreen and Vally (2006) have pointed out that a founding principle of the constitution of South Africa is common citizenship and mutual accessibility and enjoyment of an array of rights including freedom of expression, religion, belief, assembly and association. Furthermore, a range of socio-economic rights include accessibility of basic and adult education, with an emphasis on children's rights in the Bill of Rights (Motala, 2001; Spreen & Vally, 2006). These assertions are aligned with a statement by Berkvens et al. (2014) that, it is a fundamental right for every human being to access education and no child shall be excluded from acquiring basic education. This suggests that, every learner/student wishing to do agricultural sciences at school should not be deprived and discriminated, regardless of their age, gender, sexual orientation, linguistic and cultural background, and socio-economic status. Furthermore, the educational system has a responsibility to promote and practice inclusive education for all (Ngubane-Mokiwa & Khoza, 2016). Thus, accessibility, in education, needs to start with educators having access to all teaching-learning facilities. This will enhance the accessibility of good quality education for learners. Furthermore, access to education includes physical access which is the possibility of reaching the school, financial access which is the affordability of education, and cultural access which is the social acceptability of the learning programme/subject (Berkvens et al., 2014).

The endeavours of citizens (learners/students) from sprawling rural areas, poor townships and informal settlement to connect distance travelled and safety to the obstacles that prevent them from reaching (physical access) and obtaining good quality education has been a long-term feature of community struggles in South Africa (Spreen & Vally, 2006). This elucidates that the proximity of schools to where educators and learners stay has an effect on accessibility of schools, mainly in rural areas where schools are far and, transport is another challenge. Unlike in most urban areas and townships where there is quick access to school premises (McDonald, 2008). In some rural areas and poor townships, distance between

teaching and learning sites (schools) is not the only challenge making it difficult to access education. Bad gravel roads, and having to pass through unsafe forested areas and rivers, deprive children whose parents do not have cars or money to pay transport for children to reach schools (Spreen & Vally, 2006).

Furthermore to this, in some instances physical access also relates to educators being permitted to any physical infrastructure where teaching and learning might take place (Mpungose, 2016). This suggests that, agricultural sciences educators should be allowed to use science laboratories, computer labs, and school gardens, to educate learners. In the learning activities section, it is mentioned that agricultural sciences teaching and learning activities do not only take place inside classrooms, even outside where learners may touch soil, plants and animals, learning does take place. This is aligned with principles of the competence curriculum which is described by Bernstein (1975) to be a curriculum where teaching and learning occur anywhere possible, either demarcated or not. Unlike in performance curriculum, teaching and learning takes place in demarcated learning sites.

In addition to the above, financial exclusion is one of the biggest challenges facing school systems throughout the year. In remote and economically poorer places, the priority has to be with the large numbers of children who never get to see the inside of a classroom (Ainscow, 2005). This talks to areas where nearby schools are fee-based schools, so learners need to pay school fees (financial access) to acquire education. Financial constraints give birth to poverty, and are one of the major obstacles blocking education access. This is due to the fact that costs of school fees, uniforms, stationary, and transport is a heavy burden on many (Spreen & Vally, 2006). However, the Department of Basic Education, as a means of promoting financial inclusivity in education, passed a law that eliminates school fees and with the assistance of social development, food was also given to learners since no person can learn with a hungry stomach (Ainscow, 2005; Motala, 2001). The Department of Basic education also avails bursaries, Funza Lushaka Bursary Scheme, to assist students who wish to pursue a teaching qualification to access the educational workforce. After completion, teachers are then placed for employment in provinces of their choice. This means, if it was not for the government's financial intervention, many would be still stuck at home unemployed due to

lack of money for tertiary education. This suggests that finance is sometimes a barrier to education for both educators and learners.

Furthermore, according to Suleiman and Barry (1997) agricultural sciences in schools is structured around three major concepts namely production, economics and protection, and it should be structured and taught to make an impression on society (social acceptability), regardless of who teaches it. Curriculum at schools, in fact in any level of education, should be taught by any educator irrespective of culture, gender/sex, race, and linguistic background (cultural/social access) (Mpungose, 2016). However, at some instances society determines the direction, rate and application of scientific discoveries bas on what it deems as relevant to its citizens (Evans, 1970). This indicates that at times, society fails to look at major current issues it faces; such as droughts, resource pollution, food production and food security, and the overgrowing population, because it (society) focuses on personal differences. This fashion tends to restrict people/educators from teaching in schools in some areas, even though there is a lot of intervention to be done. More on the intervention, Olaitan (1988) reported that, in many rural areas, learners/students from farming homes come to school with farming problems like disease infestation in both livestock and crops, weed control, parasite control and little means to have a sustainable production and productivity of agricultural resources. Olaitan (1988) further advised that such problems might only be solved when these students are exposed to training at schools in order they can also be enthusiastic to pursue agricultural fields to solve societal challenges. This suggests that, learners should also be allowed to do agricultural sciences at schools and educators should also be allowed to educate agricultural sciences to inculcate practical skills, values and knowledge which could help school leavers to solve real life problems. This should be done irrespective of who is the educator, where they are coming from and which language they are speaking.

However, accessibility of teaching-learning facilities, and education can never be discussed solely without mentioning where (location) teaching and learning will take place (Van den Akker et al., 2009). Based on the literature above, an ideal educator should have good facilitation skills and also should be able to use many approaches to meet every learner's needs. As nature evolves, especially from climate point of view, agricultural practices also much change with changes in environment. This requires an agricultural sciences educator to

be a life-long learner and a researcher in order to always be updated about the current issues. Sadly, since CAPS is rooted primarily on instrumental curriculum development approach, its policies are constant and not flexible to environmental and societal changes. This makes it hard for educators to fulfil the role of being a researcher, because even the time allocated is not enough to cover the prescribed topic. All the roles discussed above are indicated by CAPS, but the challenge is their feasibility, and it is impossible to fulfil all of them.

2.6.8 Environment/location where Agricultural Sciences teaching and learning take place

Location refers to where teaching-learning is taking place (Khoza, 2013a). Learning should take place within an interesting, motivating and sound environment. The assertion that learning should be "carried out in inspiring environments that provide adequate teaching and learning materials" is affirmed by Berkvens et al. (2014, p. 18). Technology integration in learning environment has brought that interest and motivation to make environment inspiring to learners (Agbulu & Ademu, 2010). With adequate or insufficient resources, agricultural sciences educators have a mandate to educate learners in schools in a formal setting because agricultural sciences educators possess technical agriculture and professional education (Ndwandwe & Dlamini, 2013). This means that a demarcated space for teaching-learning to take place must be used in order for the curriculum implementation process not to be disturbed (Bernstein, 1975; Khoza, 2013b). This model of using a demarcated area for implementing curriculum is referred to, by Stenhouse (1975), as a performance curriculum model. However, even though the area may be demarcated, the internal environment should also be conducive and friendly for both educators and learners in order for teaching-learning to take place smoothly (Pansiri, 2008). This suggests that, because agriculture falls under the science category, the location where its teaching-learning process takes place should be equipped with necessary resources to attain the intended curriculum goals. The environment (classrooms and laboratories) for implementing agricultural sciences should have the basic tools such as textbooks, a chalkboard, and basic laboratory kit (Waithera, 2013).

Furthermore, Church, Elliot, and Gable (2001) mentioned that, while common innovation and technology integration makes teaching-learning environment more friendly, infrastructure sets the basic conditions for proper teaching-learning. The space between desk rows should

allow free movements from the front to the back of the classroom (Stenhouse, 1975). A study conducted by Mbajiorgu et al. (2014) which focused on determining factors affecting teaching and learning of agricultural sciences at Mandlethu FET school in Mpumalanga, reported that overcrowded classrooms and a lack of sitting benches is some classes affected teaching and learning Agricultural Sciences Curriculum. If classes are overflowing, that puts a strain on the educator because apart from struggling to deal with difficulties in making sense of the subject matter, they also needs to deal with noise and disturbance due to the congestion in classrooms. Teaching and learning cannot take place where there is noise (Johnstone & Letton, 1991; Khoza, 2015d). This suggests that schools should take note of the teacher-to-learner ratio and the number of learners per classroom (Thobega et al., 2011). Also classroom furniture should accommodate all learners and be equivalent to the number of learners allocated in it. Additionally educators should reflect on how conducive and friendly their teaching-learning environment is. This allows educators to better understand the significance of a favourable environment in implementing/enacting curriculum.

Apart from classroom environment, which should be active, agricultural sciences as a practical subject requires facilities like land/gardens/fields and animals paddocks (Agbulu & Ademu, 2010; Boone et al., 2006). However, the demand for all these may be difficult for many schools to secure in order to facilitate practical teaching and learning of the subject (Boone et al., 2006). CAPS also does not specify anything regarding lessons taking place in the field. The annual teaching plan for agricultural sciences only allocates time to teach the prescribed topics but silent on time for practical activities, such as ploughing gardens and visiting farms. This may indicate that neither the government nor districts have so far been able to allocate enough funds for schools to receive all the necessary education material. This informs us that learning does not only take place in demarcated areas, as in performance curriculum. Learning does take place even in an informal environment, as long as that environment provides significant information/knowledge (Nakpodia, 2013). However, there is time allocated for each and every subject being taught at a given location (Van den Akker et al., 2009).

2.6.9 Time for teaching Agricultural Sciences

In the previous section, literature discussed the location where teaching- learning take place and how friendly the environment should be. Each and every location, there is time speculated for it to be occupied and teaching-learning process is allocated time (Wilkins et al., 2003). The word 'time' refers to when and how long should educators educate learners (Khoza, 2013b), and greater amounts of instructional time are directly proportional with learner achievement (Wilkins et al., 2003). This assertion by Wilkins et al. (2003) is in agreement with Wiley and Harnischfeger (1974) who stated that increasing the amount of time in which learners engage in educationally significant activities, as distinct from the less significant or merely instrumental, has significant implications for the curriculum. That will in turn lead to higher test scores.

A case study conducted by Khoza (2015c), on reflections of student educators on their practices of Curriculum and Assessment Policy Statement, reported that some educators reflected that time given for the content is the strength of CAPS. Furthermore, time allocated, to teach CAPS's subjects, is relevant and fully support its allocation. However, Participant 18, highlighted challenges which disturbed teaching and learning time for educators and learners. Amongst other challenges, she complained about the number of unproductive meetings, mainly from educators' union, which consumed valuable time discussing minor issues which sometimes resulted in no resolutions. Khoza (2015c, p. 114) suggests that, educators, "should negotiate their way out of these challenges in order to be successful in interpreting CAPS within their studies. On the other hand the department should make a plan that may bring about solutions in addressing the issues of unplanned (fruitless) meeting during school time". Therefore agricultural science educators should critically reflect on their teaching time in order for them to be able to manage time effectively to make sure that at the end, there is no curriculum backlog.

Furthermore, the issue of importance of time is also indicated by Orstein and Huskins (2004) to be a valuable resource which in non-renewable and should be used or managed wisely. This means that more time should be spent by Agricultural Sciences CAPS educators planning, teaching-learning with learners. The more time educators spend interacting with their learners, the more the implementation process could takes place (Orland-Barak &

Yinon, 2007). However, Ennis (1994) states that, time spent with learners does mean good quality time since it does not guarantee a good use of that time for teaching. The minimum time allocated by CAPS (2011) for agricultural sciences is four hours per week per grade, with 40 weeks in total. I believe if there were no other school activities such as meetings, sports and school entertainment events, this time would be adequate. This is due to the fact that the Annual Teaching Plan for agricultural sciences (Grade 10 -12) does cater for other events educators have to attend (event such as staff meetings, sports and social gatherings). Moreover, CAPS (2011) indicates that every week, each educator should give their learners at least 2 class activities (classwork) and 2 home activities (homework) with their work marked and corrected. This puts too much pressure of educators' time as they sometimes need to plan extra teaching lessons with learners. What's more, CAPS has too much admin work, to be done by educators, that is demanding much of their time for planning and teaching. Thus, educators need to conduct extra classes to compensate the lost time during other school activities.

However, another challenge with time management is that CAPS says nothing about extra classes conducted before/after school hours (morning, afternoon, and evening classes), on weekends and during holidays. Also, there is no time allocated for practical experiments and outside classroom activities such as visiting gardens and livestock, including game reserves for wild/game animals. Nothing is said about the time lost during examination period when educators can't meet with learners when they (learners) are writing another subject on that day, but the work schedule (ATP) has topics to be covered in those days. Hence, there is a need for a study to be conducted using action research under the critical paradigm because the critical paradigm deals with knowledge of reality and activities that are taking place on the ground (Christiansen et al., 2010; Cohen et al., 2011). This indicates that there is inconsistency and irrelevance between policies drafted and their practicability, meaning that CAPS (2011) has some loop holes which, if not closed, may negatively impinge on CAPS's future sustainability.

2.6.10 Assessing the learning of Agricultural Sciences
Learning is defined by Khoza (2015d) as an act of developing knowledge, skills, and cognitive level in order to attain learning outcomes. Learning outcomes, being what learners

are able to know, do and understand after any teaching and learning programme (Kennedy et al., 2006). As an educator, in order to be able to know if the intended curriculum goals together with the learning outcomes have been achieved/attained, assessment needs to be done (Van den Akker et al., 2009). Regarding assessment, a lot has been argued concerning assessment procedures in education. The arguments have been mainly based on moving from assessment of learning to assessment for learning (Torrance, 2007). The transition might have been attributed to the fact that assessment should be employed to assist or support learners learning rather that judging and criticising learners' progress and confidence based on how much they've managed to achieve/reach. In addition, grading after marking is done to see individual and overall levels of learners in order to know learners' strengths and weaknesses (Liu & Carless, 2006). Moreover, assessment, according to Kennedy et al. (2006), can either be formative, summative, or continuous. Therefore, agricultural sciences educators' reflections on assessment will assist them to understand the assessment methods and how each is significant in learners' performance.

Educators use assessment information in many ways, but processing formative assessment is when assessment is used to help learners to learn more, to track learners' progress toward imperative learning outcomes, to make a decision on resources should be allocated and to check effective adoptions of teaching/ learning (Stiggins, Arter, Chappuis, & Chappuis, 2007). Thus, Khoza (2015a) refers to formative assessment as assessment for learning, as it is part of the learning process. Assessments for learning happens while the learning process is still underway, and they are conducted throughout the teaching and learning process to diagnose learner needs (Hoadley & Jansen, 2013; Khoza, 2013b; Stiggins et al., 2007). This suggests that processing formative assessment is mainly undertaken for agricultural sciences educators to provide feedback to learners and assist them on ways to improve the quality of their work, in order for them to see and feel in control of their journey to success. In a nutshell, formative assessment puts aside the grading function as it (grading function) is used in assessment of learning. In this case, this is all about getting better (Stiggins et al., 2007). It is for this reason that agricultural sciences educators need to reflect with this type of assessment in order to develop teaching and learning.

Furthermore, Chappuis and Stiggins (2002, p. 1) outline that, "teachers who assess for learning use day-to-day classroom assessment activities to involve students directly and deeply in their own learning". Bennett (2010) extends, to this by also mentioning that formative assessment is undertaken to provide feedback and correctives at each stage of the teaching-learning process. Bennett (2010) further asserts that, formative assessment is not a test but a process since the results of this assessment is used to adapt the teaching in order to meet the learners' needs. Stiggins et al. (2007) states that, grading is not part of formative assessment, and a study by Sadler (1998) agrees with this assertion, as it emphasises that grades/marks do not always deliver much formative effectiveness, This is due to the fact that in some cases grading can be counterproductive, particularly with slow learners who would feel their presence in schools make no significance on their learning abilities by the frequency of low grades on their informal tests. In this case, assessment has demotivated such learners. However, Black and Wiliam (2009) as well as Chappuis and Stiggins (2002) indicate that the informal tasks like homework, classwork and oral presentations are vital to assess learners because after marking, an educator spares time to do corrections with learners so they may improve from their mistakes. This suggests that agricultural sciences educators should always employ formative assessment as the learning process continues, in order to transform learners understanding and abilities. Also, after assessing, feedback must be given to all learners and sometimes meet learners individually if there is a need.

Furthermore, after a series of formative assessments, there should be summative assessment which summarise the overall performance of each learner, as it is an end-of course assessment by grading learners at the end of the teaching-learning programme (Hoadley & Jansen, 2013; Kennedy et al., 2006; Khoza, 2015d; Stiggins et al., 2007). These activities are given at intervals and are formal, thus they can also be regarded as interval assessment activities. This means that summative assessment, as assessment of learning is identified appropriately by Khoza (2015a) & Stiggins et al. (2007). It is an assessment for learning because there is no feedback aimed to improve learning since it is done at the end of the teaching-learning programme. Its primary purpose is to document what students know and can do, and secondarily to support learning (Bennett, 2010). In this regard, the purpose of summative assessment can be differentiated from the one for formative assessment using the following design (Table 2.1):

Assessment type	Assessment *of* Learning	Assessment *for* Learning
Summative	**X**	✖
Formative	✖	**X**

Key: **X**= Primary purpose; ✖= Secondary purpose

Table 2.2: Summative and formative assessment purpose design

The design (Table 2.2) clearly shows how the assessment types differ as based on their primary and secondary purposes. The design is in accordance with the literature indicated on assessment, as it shows that summative assessment has a primary purpose of assessing if learning did take place, in order for the learner/student to proceed to the next grade/level. Formative assessment primarily assesses if learning is taking place in order to improve and transform the learning of learners. However, summative assessment does assess learning since if a learner doesn't proceed to the next grade after teaching-learning processes, s/he will have to redo the whole course so as to improve his/her grades. Formative assessment can secondarily be an assessment of learning since tests, formal or informal, can be given after each and every chapter in order to see what learners managed to grasp after a section/chapter. This suggests that these two assessments cannot be used independently (Bennett, 2010).

Furthermore, studies by Bennett (2010); Black and Wiliam (2009); Chappuis and Stiggins (2002); Hoadley and Jansen (2013); Khoza (2015a); Khoza (2015d); Paul and Dylan (1998) did not relate summative with formative assessment in the same way the above design does. These studies, discussed summative solely as assessment of learning, and formative solely as assessment for learning. The relationship, where secondary purposes are outlined by the above design, between the two assessments is missing from the studies. So, as much as summative is assessment of learning, it has a secondary component of being assessment for learning, in the same way as formative assessment has a component of being assessment of learning.

A study by Kennedy et al. (2006) indicated that continuous assessment includes the repeated recorded marks of summative assessments and there is little or no feedback given to the

learners. The recorded continuous assessment (CASS) marks are added to the final exam mark at the end of each year in order to give a summative grading which concludes the overall performance of each leaner (Education, 2000). During each term, the recorded marks are not interrupted until they are used at the end of the year and can be linked to the uninterrupted activities discussed earlier. This means that for each and every term, the formal School Base Assessment (SBA) tasks, together with the end-term exam/test, are recorded together to give the term report of each learner and the records are kept to be used again to give the final report if the learner is progressing to the next grade or not (Education, 2011). Thus, Hoadley and Jansen (2013) mention that continuous assessment takes place at intervals throughout the teaching-learning period. CAPS (2011) does not include the informal assessments, which are formative, into CASS records, which is why Kennedy et al. (2006) says there is little or no feedback from continuous assessment. However, Herna´ndez (2012) and Kapambwe (2010) have a different view from the one indicated by Kennedy. They perceive continuous assessment   as an ongoing diagnostic classroom-based process that uses a variety of assessment tools to measure learner performance. This means that, according to them, continuous assessment does have a formative function for learning, whilst also having a summative function for certification/ reporting.

Additionally, there should be a strong and direct link or connection between assessment and curriculum goals which include learning outcomes (Berkvens et al., 2014). Therefore, assessment should be based on the intended curriculum which is dependent on the attained curriculum (Mpungose, 2016). Thus, assessment is central to the learners experience as it frames learning. This suggests that agricultural sciences educators should understand the assessment methods and know which one to use and for what purpose. No education reform can be met without assessment and that is how educators keep track of learners' progress. Assessments give educators a chance to reflect on their teaching and they (assessments) are pivotal for transformation purpose. Remedial actions depend on the results after assessing learner progress, and a positive feedback depends on how the remedial action took place. Hence assessment is an important tool in education. These assertions are well supported in literature (Bennett, 2010; Berkvens et al., 2014; Bloom, 1975; Chappuis & Stiggins, 2002; Herna´ndez, 2012; Hoadley & Jansen, 2013; Kennedy et al., 2006; Khoza, 2013a, 2013b, 2015b, 2015c, 2015d; Paul & Dylan, 1998; Sadler, 1998; Stiggins et al., 2007; Temur, 2007; Torrance, 2007).

2.7 Conclusion

The literature discussed above has revealed work done and reported by other researchers on educators' reflections, educators' practices/experiences, curriculum enactment and implementation issues, agricultural sciences as a subject, curriculum in general and Curriculum and Assessment Policy Statement. The curricular archetypes (rationale, accessibility, goals, content, learning activities, educator role, resources, learning environment, time, and assessment) were the focal point of this literature, and it is evident that these archetypes form an integral part of curriculum implementation/enactment. Furthermore, the literature reveals the significance of educators' reflections on their practices of curriculum implementation. Illustration of the research methodology will be shown by the next chapter, as it outlines how this study will answer the research questions.

CHAPTER 3

Research design and methodology

3.1 Introduction

The previous chapter, the literature review, presented literature from studies conducted on educators' reflections on their implementation/enactment practices of Agricultural Sciences curriculum worldwide, including in South Africa. The literature review chapter (Chapter 2) outlines themes associated to curriculum and form fundamental base of a successful curriculum. The themes included educators' reflections as the phenomenon of the study, curriculum enactment, curriculum implementation, and curriculum design approaches (instrumental, communicative, artistic and pragmatic approach). Chapter 2 also delineated ten curricular archetypes as the archetypical framework (conceptual framework).

Thus, this study aims to explore educators' reflections on their practices of Agricultural Sciences Curriculum and Assessment Policy Statement (CAPS) through the following objectives:

- Identify educators' reflections on the implementation of the current South African Agricultural Sciences Curriculum (CAPS)
- Understand what enlightens educators' reflections on their practices of Agricultural Sciences Curriculum (CAPS)
- Explain the lessons that can be learnt with educators' practices in implementing Agricultural Sciences Curriculum CAPS

To achieve the above objectives, this study intends to answer the following questions:

- What are educators' reflections on implementing the current South African Agricultural Sciences Curriculum (CAPS)?
- What enlightens educators' reflections to be the way they are about their practices?
- What lessons can be learnt with educators' practices in implementing Agricultural Sciences Curriculum (CAPS)?

This chapter delineates and discusses the procedures involved in designing the study and the methodology. These procedures include a critical paradigm, action research, and purposive convenience sampling, as the research paradigm, research approach and sampling method, respectively. This chapter also contains how each datum is going to be generated through reflective activities, semi-structured interviews, and focus group discussions. Furthermore, how data were analysed (guided analysis) together with trustworthiness/ authenticity that encompass credibility, dependability, transferability, and conformability will be delineate in this chapter. Ethical issues and the limitations of this study were covered as well. Hakim (2005) describes research design as the systematic chronological step-by-step pattern in which a particular research is intended to be determined. This description of a research design is in line with a definition by Christiansen et al. (2010) that it is a logical sequence that relates empirical data to a study's initial research objectives and conclusion. According to De Vaus (2001), the function of a research design is to ensure that the evidence gained allows the researcher to effectively address the research problem logically and as unambiguously as possible. Thus, this chapter intends to describe the logical details of the research plan to address the research objectives and questions stated above. The model (figure 3.1) below summarises the research design and methodology.
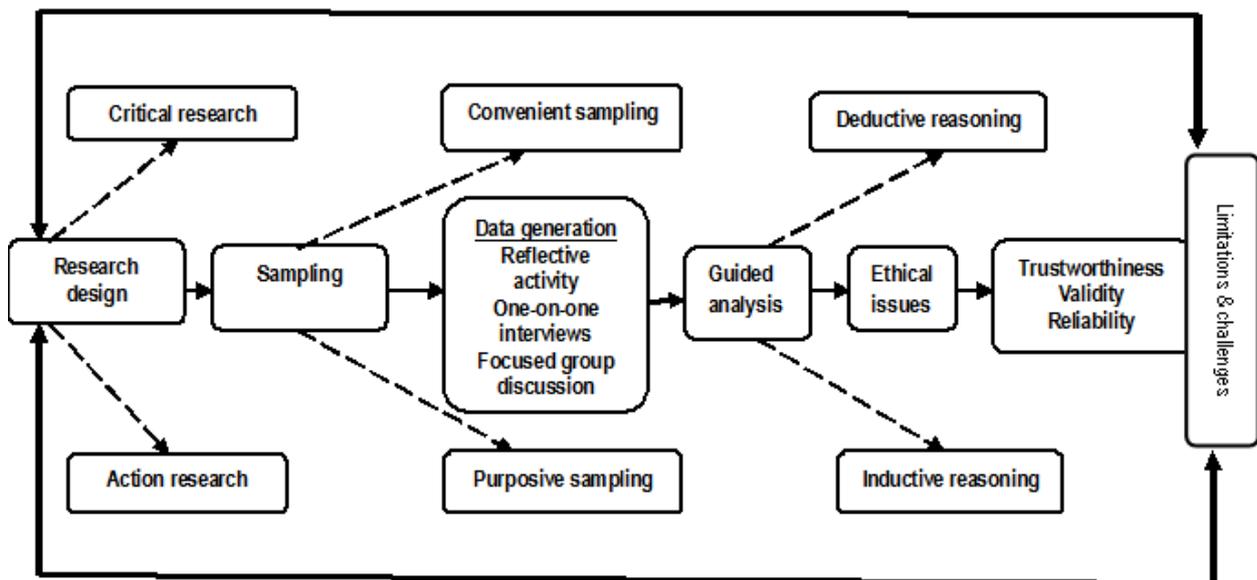

Figure 3.1: Chapter 3 flow model

3.2 Research paradigm

The words *research paradigm* are defined by Hakim (2005) as the generally accepted perspective of a particular discipline at a given time, and the systematic arrangement of all the involved concepts/theories. Collins and Hussey (2009) further outline that a research paradigm is a reflection of a set of principles or beliefs about the nature of the world, including what is to be known and how can we know and understand it better. This suggests that each research paradigm is defined by the way datum is collected and how the findings are interpreted. Hakim (2005) together with McGregory and Murnane (2010) share the same view that a research paradigm shapes the research and diversity of the whole body of knowledge. Furthermore, McGregory and Murnane (2010) have the same belief with Christiansen et al. (2010) that, in academia, it is commonly known that a paradigm sets assumptions, concepts, practices and values that constitutes a way reality is viewed for the community that shares them. Each paradigm is attached to particular methodologies that recognise assumptions about the values, knowledge, logic, and reality.

Moreover, several studies (Christiansen et al., 2010; Cohen et al., 2011; Creswell, 2009; De Vaus, 2001; Hakim, 2005; McGregory & Murnane, 2010) state that there are three main research paradigms: the post-positivist, the interpretive, and the critical paradigm. Each of the three paradigms has its own view and interpretation of the world with its values, logic, and reality. According to Cohen et al. (2011), post-positivists endeavour for predictability, objectivity, patterning and the construction of laws and rules of behaviour. Then again, the interpretive paradigm thrives to understand and interpret the world in terms of its role players, but the critical paradigm acknowledges the political and ideological context in order to support the transformation.

Moreover, because Cohen et al. (2011) together with Krauss (2005) assert that critical paradigm is an ideal paradigm to use if a researcher intends not to just know and understand societal challenges but also come with means to rectify social injustices and biasness, this study falls under the critical paradigm. Additionally, critical paradigm primarily focuses on power and liberation as it intends to reveal power relationships within societies or societal institutions (McGregory & Murnane, 2010). Upon revealing the power relations in society, individuals who have little or no power, who feel oppressed by the system and restricted to

access some services, need to be assisted and liberated in order for them to live in harmony and perform their duties smoothly (Christiansen et al., 2010). Based on the fact that, in this study, educators had to reflect on their practices of teaching-learning, together with how government policies affect how they execute their duties, the critical paradigm was the most appropriate paradigm. Furthermore, it is evident from several writers' works that the curriculum policy document is a political document (Freire, 2005; Hoadley, 2007; Jansen, 1999; Stenhouse, 1975) that is developed at national level (Tyler, 1959; Van den Akker et al., 2009) and does not always empower everyone at the implementation or micro or classroom level (Stenhouse, 1975). This suggests that reality, in all educational institutions, is characterised by political, social, and cultural economic values and history. Thus, critical paradigm in this study was used to transform how Agricultural Sciences educators implement the intended curriculum, by addressing the social, political, and cultural injustices of the system.

In addition to the above assertions, this study adopted a critical paradigm because it wanted to get the in-depth of the reflections directly from the educators since they are the users of the nationally developed Curriculum and Assessment Policy Statement. This was done by facilitating participation with and amongst educators in such a way that their consciousness is raised about the fact that they are oppressed. In some instances, educators may know that they are oppressed but feel incapable of taking actions. Thus, critical paradigm was adopted as the most suitable emancipator process that leads to personal empowerment. Also, it was used in order to take steps towards changing educators' circumstances and the entire education system.

McGregory and Murnane (2010) further assert that research methods focusing on inclusion, social justice and liberation include reflective phenomenology, critical analysis, and action research. This assertion is in line with my justification of using a critical paradigm and action research (this will be discussed under research approach/style) as means to giving voice to the educators and leading to social transformation. Further to this, educators were able to critically transform their attitudes and teaching practices when implementing the Agricultural Sciences Curriculum and Assessment Policy Statement.

Additionally to the above, because this study is rooted on power dynamics and social practices, it is qualitative in nature. McGregory and Murnane (2010) assert that qualitative research is predominantly grounded on feelings, reflections, perceptions, and meanings, as opposed to quantitative research which is grounded on numerical analysis and measurements. This suggests that this research studied issues in their naturalistic state. Thus, the research is qualitative and realistic in nature. Agricultural Sciences CAPS educators in this study are therefore exploring their practices on the implemented curriculum giving their own reflections about the intended, implemented and attained curriculum. Cohen et al. (2011) and Christiansen et al. (2010) agree with the above assertions as they also indicated that qualitative research attempts to find how people perceive their lives, and different people can perceive the truth differently. This makes qualitative research subjective, and there is little social distance between the researcher and the subject. Thus, Christiansen et al. (2010) even affirm that qualitative approach allows the researcher to comprehensively understand how different people make subjective sense of their lives. I managed to get a comprehensive understanding of why educators teach Agricultural Sciences. Also, the information gathered did not only fulfil the purpose of just completing this study, but encouraged the educators to change and transform their own attitude in teaching the subject. Therefore, socially constructed realities were dealt with and educators now know and understand factors that underpin their teaching of the Agricultural Sciences curriculum.

It is said that many qualitative researchers have a belief that the best way to know and understand any phenomenon is to view it in its realistic context (Krauss, 2005). They view quantification as being limited in nature. Krauss further asserts that qualitative researchers operate under diverse ontological assumptions about reality without assuming that there is a single unitary reality. Furthermore, I chose qualitative approach because "qualitative research is based on relativistic, constructive ontology that posits that there is no objective reality. Rather, there are multiple realities constructed by human beings who experience a phenomenon of interest" (Krauss, 2005, p. 760).

However, McGregory and Murnane (2010) also indicate that biasness and manipulation are a shortcoming of the critical paradigm. To overcome this shortcoming, I made sure I asked the same set of questions to all participants during interviews. We interacted as if we were discussing specific issues and not as if we were being directed to answer the questions. This also triggered the subconscious mind to be active in order for participants to efficiently reflect. Also, asymmetrical power relationships between the participants and the researcher is viewed by Christiansen et al. (2010) to be another shortcoming of the critical paradigm. I addressed this issue by allowing the participants to be researchers as well, as we all were teaching Agricultural Sciences, and shared mutual challenges regarding curriculum implementation. We were all involved as educators with a need to transform our teaching-learning practices. This was done without me using the inherent power of being a researcher. What also helped the process was that we were all post level one (PL1) educators, thus, we all had mutual power relations with one other.

3.3 Research approach/style

McGregory and Murnane (2010) assert that, each and every research paradigm has approaches/styles that are appropriate for them to achieve their intended objectives. Therefore, for this study, I chose action research because I intended to explore educators' reflections on their practices within their realistic context and gain an in-depth knowledge and understanding of issues affecting how they implement Agricultural Sciences Curriculum (CAPS). Action research is said to be a term which describes the assimilation of action with research. The action component being the implementation of a plan, whilst the research component is developing an in-depth understanding of the effectiveness of this implementation (Lewin, 1947). Reason and Bradbury (2001, p. 1) define action research as "a participatory, democratic process concerned with developing practical knowing in pursuit of worthwhile human purposes, grounded in a participatory worldview which we believe is emerging at this historical moment. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities". Action research is also referred to as teacher research and teacher-as-researcher and is said to be an approach designed to develop and improve teaching and learning (Corey, 1953). Lewin (1947) believes that, in education, this approach is one method educators use for improvement, not only in their practices but their students' learning

outcomes as well. Thus the central goal of this study is positive educational change since educators in action research process are required to plan, act, observe and reflect on their day-to-day practices in order to transform their practices.

Furthermore, the above assertions suggest that, educators use action research because it deals with their own challenges, not someone else's, and it provided educators with opportunities to better understand and improve their educational practices. Thus, it was imperative for me, as the researcher, to explain the curricular archetypes to the educators, as the participants, in order for them to know the theories that underpin their education experiences. Therefore, through this action research, I and the educators determined alternative ways of viewing and approaching educational challenges and we reached a consensus as to how would examine our own day-to-day practices in order to improve the teaching-learning processes.

Moreover, a research style/approach is also viewed by Henning, Gravett, and Van Rensburg (2004) as the logical link between the data to be collected and the conclusions to be drawn from the research questions. It included the way activities of a research should be conducted and managed, and how a research approach should meet the standards of a particular research paradigm, together with how reality is viewed (Leedy, 1985). Thus, the ontological nature of this research, and its questions, seeks to answer questions rooted on human perceptions. The epistemological nature of this research required a close relationship between the researcher and the object studied. I found action research also to be appropriate simply because the study was about educators' reflections of which the reality could not be mathematically measured, but constructed in the minds of the educators, the participants.
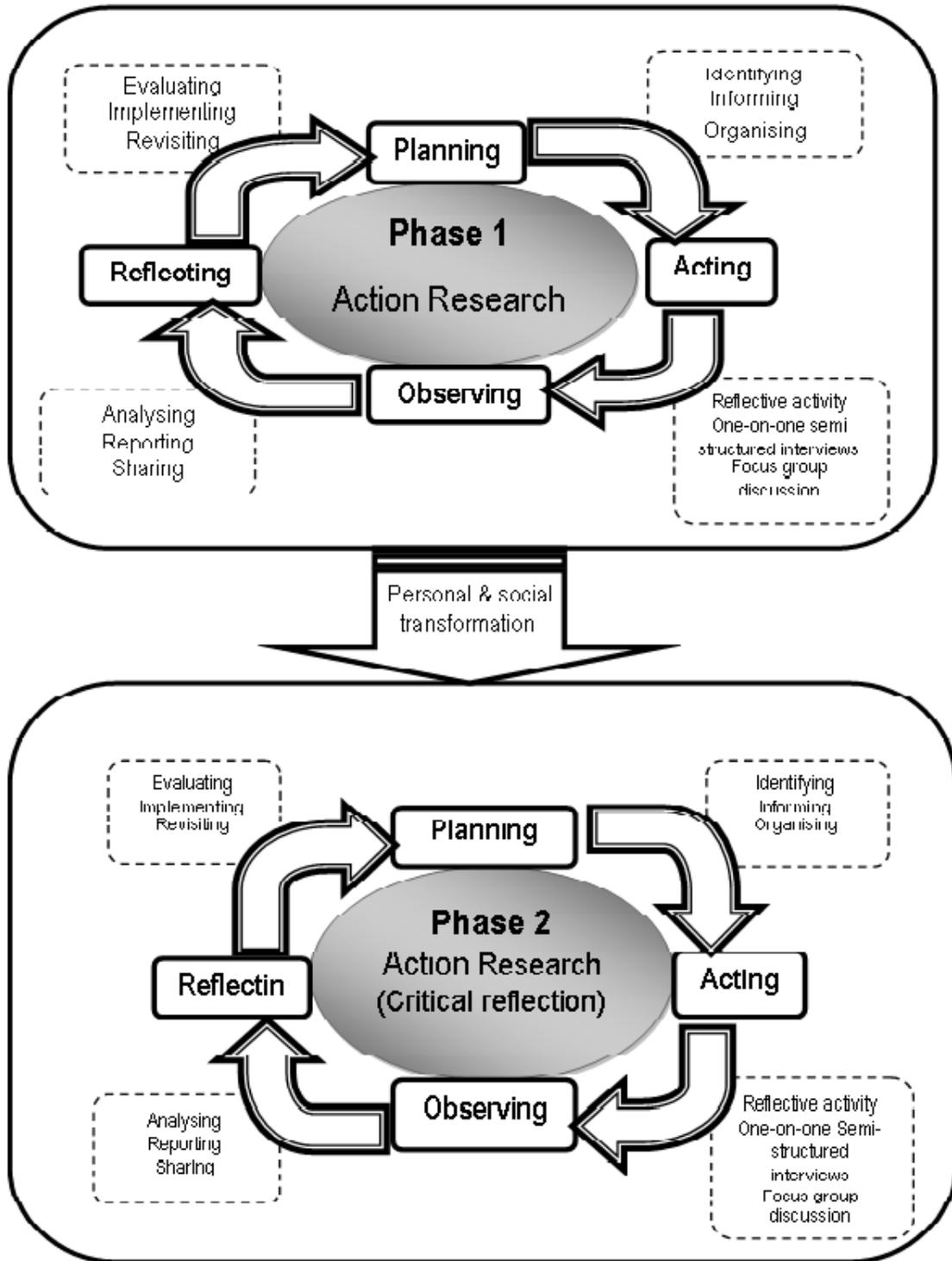
Figure 3.2: Action Research Cycles

This study's action research is shown by cycles of action research illustrated by Figure 3.2 above. The figure also shows the two phases this action research used to bring social transformation to educators' teaching-learning practices. The cycles outline procedures of this action research, starting with identifying a plan based on the challenges educators experience with their day-to-today teaching-learning practices. The planning stage is coupled with strategies thought to improve educators' experiences. 'What if I do this instead' is the pre-or-mini research question. The challenge educators are faced was the varying implementation of the intended curriculum, and that was the issue to be transformed. The questions and data generation methods were developed and adopted in order to explore the educators' in-depth reflections on their practices. However, before embarking further to the next step (the acting step) we discussed about how best we could conveniently generate data without inconveniencing anyone in his/her duties.. This was for everyone to organise themselves for further steps.

Further, for the actual action (acting step), reflective activity was issued to each educator in order to reflect on his/her own teaching-learning practice. The reflective activity was rooted on the curricular archetypes, of which none of the educators were aware. Each reflected without much understanding that some archetypes and how they (archetypes) underpin their (educators) teaching practices, not only as Agricultural Sciences educators, but as educators in general. For instance, they (educators) were not aware that there is personal, societal, and professional rationale for one to be teaching. Furthermore, they were not aware that goals included aims, objectives, and learning outcomes, let alone being ill-informed about all their roles as educators. I then conducted a semi-structured one-on-one interview with each educator where I interviewed them in order to reach their core understanding of the curricular archetypes. The last part of the research process was sitting together to discuss their reflections and the curricular archetypes, in relation to their practices. The observation step included analysing their reflections and discussing them so that they may also critique themselves based on their knowledge of curricular archetypes. Reflecting on the steps taken, thus far, it was evident that educators were not well knowledgeable about the curricular archetypes. I gave them articles to read in order to assist them with understanding the archetypes and also enable them to do self introspection (evaluation) on how best they can implement the curriculum. They by some means showed gratitude because they were not aware of the curricular archetypes. As a result there was a need to revisit the process again,

starting from the planning stage again in order for them to critically reflect (critical reflection) on the second phase of the action research.

The planning stage of the second phase concentrated on improving educators' reflections in the first phase. Curriculum implementation was already identified during the first phase of action research as a challenge, hence the second phase focused mainly in transforming reflections from the first phase. I informed educators that we also had to focus on their reflections, rather than on the implementation only. I believe that reflection (as the phenomenon) and curriculum implementation (as a proposition) are two aspects which needed equal attention in this action research. Both of them were rooted on the curricular archetypes. On the acting part, educators were aware of the curricular archetypes, as we discussed them during Phase One. Thus, Phase Two of action research was a critical reflection. Educators had to now critically reflect on their practices and factors that underpinned their practices in order to transform them. Furthermore, the educators' consciousness was evident when, before being issued the reflective activity, they started to debate, interrogate and criticise their ignorance on curricular archetypes which underpin their teaching-learning practices. They reflected on the reflective activity with notable conscious minds, judging from how they articulated their reflection on each of the curricular archetypes. This was evident that they socially transformed how they perceived their teaching-learning practices. During the one-on-one semi-structured interviews, the educators all proved that they clearly understood the curricular archetypes and how these underpin their day-to-day implementation processes of Agricultural Sciences CAPS. They critically reflected on all the curricular archetypes and their constituents. For instance, educators understood that they needed to reflect on personal, societal and professional aspects when reflecting on rationale. As with goals, they covered the aims, objectives, and learning outcomes. The focus group discussion affirmed that the participants had improved socially and mentally, and that they were ready to use new strategies to transform their teaching-learning practices of Agricultural Sciences CAPS. Observing their actions and reflecting on their critical reflections gave me the full confidence to say this action research was appropriate for the educators' transformation.

However, it should be noted that, findings of a critical research cannot be used to generalise and conclude other contexts since they (other context) may yield different results (Christiansen et al., 2010). To prevail over this short coming or limitation, I have included recommendations which may be beneficial to those who participated, namely Agricultural Sciences CAPS educators in a rural environment. Another limitation to action research is that there should be little social distance between the researcher and the participants (Lewin, 1947). Meaning that, I also had to be an Agricultural Sciences educator to well liberate and transform Agricultural Sciences educators. Thus, we were all in the same profession and the same rank, post level one.

3.4 Sampling

According to Cochran (1953), in any research conducted, people, animals, places and things are studied. The opportunity of studying the entire population of those people, animals, places and things is an endeavour that is not possible due to time and/or money constraints. Instead, the idea of gathering data from a population was, and is still, one that has been successfully used over the years and is called sampling. This suggests that, for most researchers, collecting data from the entire population is nearly impossible because of the amount of people, animals, places and things within the population. Sampling is then, taking data from a portion of the population. Thus, Lantham (2007) describes a sample as a subgroup of a population. Irrespective of a discipline, Christiansen et al. (2010) asserts that the definition of sampling is standard and the standard definition always includes the research's ability to select a portion of the population that is truly representative of the entire population. There is no one best sampling strategy for any particular research because each strategy depends on the context in which the researcher is working and the nature of his/her research objectives (Palys, 2008). Cohen et al. (2011) reveal that, in education research, probability and non-probability sampling is used. Probability samples include random stratifies sampling, cluster sampling, multi-stage sampling and multi-phase sampling, while non-probability samples include convenience sampling, quota sampling, and purposive sampling. Therefore, this study employed purposive and convenience sampling that falls under non-probability sampling. This was due to the fact that I targeted a group of educators I could reach easily; who did not represent the wider population; and because I had no intention of generalising findings from this study.

3.4.1 Purposive sampling

Purposive sampling is defined by Etikan, Musa, and Alkassim (2016) as a sampling technique where the samples are gathered in a process that does not allow all units of the population equal chances of being selected or included. Thus, in this study, only Agricultural Sciences CAPS educators were sampled to be included, not just random educators in the region. All the four educators were from the Lebombo cluster of the Ingwavuma circuit in Umkhanyakude district, working for the Department of Basic Education (DoBE). Since purposive sampling strategy is used depending on the resources, time available and study's objectives (Collins & Hussey, 2009; Etikan et al., 2016), I had to chose educators who are directly involved in Agricultural Sciences curriculum implementation processes in order to clearly and rigorously explore the educators' reflection on their practices of Agricultural Sciences curriculum and assessment policy statement. However, the selected educators' reflections do not represent the wider population of Agricultural Sciences educators and educators in general, and for this reason, results cannot be generalised beyond the group sampled. Furthermore, the purposively selected schools were the only school in my proximity that offered Agricultural Sciences and would be easy to access. The variation, in terms of teaching experience and qualifications, amongst the selected educators allowed me to record different reflections based on different experiences. Thus, the selected educators possessed data that answered the research questions. See table 3.1 below that shows the study's purposively sampled educators.

Educators/ Participants	School	Teaching Subjects	Grade	Qualification	Gender	Race
P1	S1	Agricultural Sciences + Maths Literacy	10 -12	M+3	Female	African
P2	S2	Agricultural Sciences	10-12	M+3	Female	African
P3	S2	Agricultural Sciences	10-12	M+3	Female	African
P4	S3	Agricultural Sciences + Life Sciences + Technology	10-12	M+4	Male	African

Table 3.1: Educators' profiles

There are always two sides of a coin and the purposive sampling approach has its shortfalls or weaknesses. Due to the fact that randomisation is very limited in purposive sampling (Etikan et al., 2016), I could not select any other educators to increase my sample size. Thus I had to select only educators who possessed the necessary knowledge, understanding, and who understood of the implementation processes of the subject. This weakness was however addressed by sampling only Agricultural Sciences CAPS educators and only schools offering the subject, even though the group of selected educators did not represent the wider population of educators but only the Lebombo Cluster of Ingwavuma Circuit.

3.4.2 Convenience sampling

"In every type of research, it would be superlative to use the whole population, but in most cases, it is not possible to include every subject because the population is almost finite (Etikan et al., 2016, p. 1). Thus, Lantham (2007) describes convenience sampling as an approach that includes participants who are voluntarily available and agree to participate in a particular study. MacNealy (1999) further indicates that convenience sampling is also regarded as accidental sampling, while Etikan et al. (2016) agree with the alternate title of accidental approach but also indicate *haphazard* as an alternate title. However, Babbie (1990) calls convenience sample as reliance on available objects. Thus, I chose four educators who were easily and conveniently accessible and available since we all taught in the same cluster and almost met regularly, when necessary. Furthermore, the selected educators were the only Agricultural Sciences educators in the respective schools. Some schools at Ingwavuma do not offer the subject and others that do, are located in areas where it is difficult to access (because of travelling and making appointments) due to time, monetary, and proximity constraints.

In addition to the above, the convenience in selecting educators and schools makes convenience sampling affordable, easier and the subjects more readily available (Etikan et al., 2016). It is for these reasons that convenience sampling is also regarded as accidental (Etikan et al., 2016; MacNealy, 1999) and subjects (schools and educators) selected because they haphazardly happened to be the ones offering and teaching the Agricultural Sciences subject. It is for this reason again that findings from this study cannot be used to generalise any information about the entire population, but the sampling only represents the group of participants selected. Therefore, the weakness of convenience sampling of choosing

97

participants that do not represent the population was addressed by selecting all Agricultural Sciences educators in schools located at close proximity to me in order to easily access them during the course of the study. Thus it was easy to even generate data for this study.

3.5 Data Generation Methods

Biggam (2011) asserts that selecting techniques by which data are to be generated is as imperative as choosing an appropriate research style/approach. This study aims to explore educators' reflections in the form of an open-ended questionnaire for participants' reflective activity, one-on-one semi-structured interviews and semi-structured focus group discussion.

3.5.1 Reflective activity (Open-ended questionnaire)

Reflective activity is viewed as ideologically transformative as it allows someone to independently and comprehensively think and reflect back on their experiences (Larrivee, 2000). Thus, Valli (2009) asserted that that the meaning of reflection originates from a Latin word that means 'to bend back', which in this cases means to generally look back at the practices, educational goals, subject matter, rationale for teaching, school organisation and culture, teaching-learning environment and the feasibility teaching, in general. The reflective activity is further described as a written task that requires a participant to answer a series of questions about the research phenomenon (Cohen et al., 2011). To generate data from participants, this study therefore took on the reflective activity as the first method before one-on-one semi-structured interviews and the semi-structured focus group discussion. This suggests that, in this study, educators were given an opportunity to reflect on their practices of implementing the Agricultural Sciences curriculum. The reflection activity was rooted on the curricular archetypes that are used as the archetypical model (conceptual framework) of this study. This reflective activity allowed educators to complete the short series of questions in their own time without the researcher's presence. Figure 3.3 below shows the questions in which the educators were expected to reflect on.
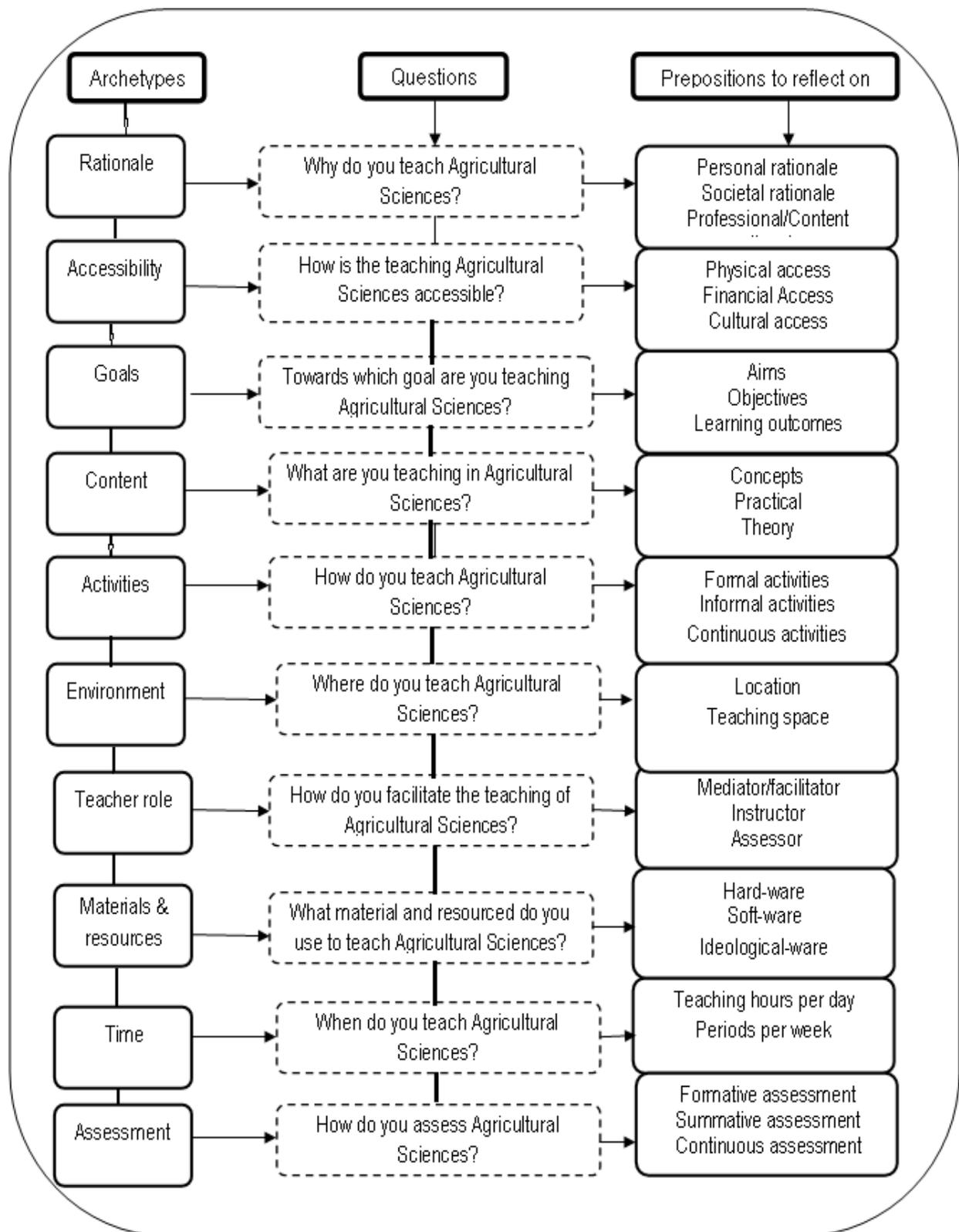
Figure 3.3: Curricular archetypes, questions and prepositions

The first question asked educators (participants) to reflect on why they were Agricultural Sciences educators. The educators were expected to answer this question based on their personal, social, and content rationale. In terms of personal rationale, educators were expected to articulate their personal enthusiasm, passion and habits that lead them to be Agricultural Sciences educators. Regarding social rationale, educators had to convey how the society or social order influenced their interest on the subject. On content rationale, educators had to state their professional stance in terms of teaching qualification and knowledgeability of the subject. The second question required educators to articulate on their goals and their responses had to be based on aims (long term goals), objectives (short term goal), and expected learning outcomes from the learners. The third question asked about the content with regards to what was being taught to learners. This question expected educators to respond on key topics taught and how knowledgeable they are about the subject matter. Question four expected educators to reveal the teaching-learning activities (tasks) employed in classrooms in order to facilitate teaching-learning processes. These include formal, informal, and continuous assessment tasks, as was explained in Chapter 2.

Moreover, question five asked about the resources educators used to facilitate teaching-learning processes, and they were expected to respond based on the hard-ware resources, soft-ware resources and ideological-ware resources. Hard-ware resources include the tools and machine in education, soft-ware resources that include components of the hard-ware used to display information, and the ideological-ware resource that describe the teaching approaches or methods. Question six asked participants to articulate how they perceived their roles as Agricultural Sciences educators as instructors, facilitators, assessors, managers and decision makers, citizens, life-long learners and researchers. This question was mainly designed to encourage educators to understand their roles and responsibilities inside and outside of the classrooms. Furthermore, accessibility of education/school was asked in question seven where educators were expected to reflect on physical, financial and cultural access. Physical access includes the transport system needed to reach schools; financial access includes funds utilised to access schools; and cultural access refers to social ethnicity, political and religious interferences impacting how teaching-learning is accessed. Question eight was investigated the location of schools and availability of venues such as laboratories, libraries, resource or science centres. Also, educators were expected to respond on the remoteness of the areas where their schools are located and how that impacts Agricultural

Sciences teaching-learning processes. The time allocated, by CAPS, to teach Agricultural Sciences was asked in question nine. Educators had to report on adequacy and efficiency of the prescribed time to cover the content for Agricultural Sciences. Lastly, question ten asked how educators assess learning and their responses were expected to be framed by the three propositions: formative assessment (assessment for learning), summative assessment (assessment of learning) and continuous assessment (assessment through learning) which include the formal tasks done with learners and contribute to the pass percentage of learners at the end of the year.

The reflective activity was given to the participants for a period of two weeks in order to make sure that they have enough time to think and critically reflect as they were answering the questions. However, it was not guaranteed that the educators were fully truthful when answering the questions, but because I was always accessible to them, they were encouraged to call and ask for clarity where they experienced challenges. After collecting the reflective activity, we then made arrangements to the following week for one-on-one semi-structured interviews.

3.5.2 One-on-one semi-structured interviews

According to Biggam (2011) interviews have long been one of the most popular methods of data gathering in qualitative research, and in this study, one-on-one semi-structured interviews were used as the second method to generate data. Rabionet (2011) asserts that, there semi-structured interview is flexible and powerful enough to capture the voices and the ways in which people make meaning of their experiences/practices. Hence, Cohen et al. (2011) and McMillan and Schumacher (1997) define semi-structured interview as a conversation between a researcher and a participant in which information is elicited about how participants make meaning and sense of their experiences in their lives. It incorporates a set of guiding questions and topics to be covered during the conversation, usually in a specific order but does allow topical trajectories that may stray from the order when the researcher feels the information is appropriate.

Furthermore, before asking the guiding questions, I first asked the participants (educators) to tell a life story about their experience as Agricultural Sciences educators and just being an educator. This triggered the subconscious mind in order for them (educators) not to restrict them or not to be restricted by the questions. Moreover, the informal manner in which the interviews were conducted made the participants comfortable and relaxed as they were also able to use the language of their choice (English and isiZulu). Since semi-structured interviews also contain open-ended questions and conversations, the discussions may diverge from the interview guide (B. Bogdan & Biklen, 2002). I also recorded the interviews and I had to later transcribe the tapes for analysis purposes. Some points were also jotted down. I basically used the semi-structured interviews simply because they allow participants the freedom to express their views in their own terms and can provide reliable and comparable qualitative data (Gilakjani, 2012; Reason & Bradbury, 2001).

Moreover, one-on-one semi-structured interviews are seen as being richer and more preferred over structured interviews because they give intricate information of the qualitative phenomena (Creswell, 2009). The participants are actively involved in semi-structured interviews, thereby empowering them and allowing free interaction with the researcher, while also the researcher allows opportunities for clarification in order to capture relevant data. In addition, the participants' perceptions and ideas are articulated in their words, rather than in researcher's words (Cohen, Manion, & Morrison, 2007; Creswell, 2009; Mouton, 1996).

The conducive atmosphere described above during the interviews is required for the participants to feel comfortable and relaxed, and this assertion is in accordance with how Creswell (2009) describes the necessary environment of semi-structured interviews should be conducted. Creswell (2009) assets that the interaction should allow a participant the time and scope to unreservedly talk about their opinions. The objective is to critically understand the participant's point of view rather than to make generalisation about their behaviour. Thus, Christiansen et al. (2010) indicate that an interviewer should be well skilled and flexible enough to trigger the subconscious minds of the participants during interviews. In addition, the interviewer's skills should allow them to let the participants reveal everything about their teaching experiences while also not drifting too far for the guided questions. Thus, I believe I

did possess the necessary skills to extract in-depth reflections of the Agricultural Sciences CAPS educators.

However, Etikan et al. (2016) assets that if the researcher is not skilled enough to allow participants to informally reflect, like I did, could results in restricted information since the participants would just answer the questions directly. Because one-one-one interviews can be time consuming and expensive, I selected schools and educators which are in the same cluster and would be easier for me, and them, to access them at any given time, conveniently. Listening while recording notes may result is missing some of the important points said during an interview, but I overcame this disadvantage by also recording the interviews using my cellular phone which I later transcribed the data in order to make sure that everything was accurately recorded and analysed.

3.5.3 Focus group discussion (semi-structured)

Focus-group discussions are discussions run by researchers, as facilitators, and participants or respondents (Boddy, 2005), and these discussions are becoming increasingly popular in social science and humanities research for exploring what people believe or feel as well as why people behave the way they do (Rabiee, 2004). The main aim of a focus group discussion is "…to understand, and explain, the meanings, beliefs and cultures that influence the feelings, attitudes and behaviours of individuals" (Rabiee, 2004, p. 655). Thus, in this action research, a focus group discussion was also used to generate data in order to critically explore educators' reflections on their practices of Agricultural Sciences Curriculum and Assessment Policy Statement. It was from the focus group discussion that the in-depth and core implementation practices were critically and collectively discussed and debated. The active interaction between participants, in a language of their choice (English and isiZulu), allowed effective and efficient data generation for this research. Thus Lunt and Livingston (1996) assert that focus-group discussions are appropriate for exploring the depth and nuance of opinions regarding issues affecting individuals and for understanding different perspectives. I, and the educators, therefore conducted the focus group discussion twice at a school central to all the four participants.

Furthermore, both of the focus group discussion phases were allocated a forty-five (45) minute period, even though the second phase exceeded this and took about sixty (60) minutes due to intense discussion and active participation of all the participants. During the first phase, the educators (participants) were still in their learning stage; from the second phase it was evident from their inputs that they had transformed; as such, 45 minutes was not enough time for a discussion. The discussion did not affect or compromise their teaching time(s) because I first consulted then of a day where they will all be free and available even if we exceed the allocated time. Requesting the meetings in advance allowed them to schedule their timing properly and make arrangements, without any inconveniences. In addition, we all scheduled time during normal working hours so that those who don't reside closer to their respective schools could be able to leave school on their normal school leaving time. The duration is in accordance with an assertion by Lunt and Livingston (1996) that a focus group discussion should be conducted for 45 to 90 minutes, and beyond that most groups become less productive due to fatigue. Primarily, exceeding the time becomes an imposition on participant time.

Cohen et al. (2011) further assert that a focus group discussion is structured around a set of carefully predetermined questions, in which in this action research they were based on the ten curricular archetypes. The discussion should be free-flowing as the participants' comments stimulate and influence the thinking and sharing of others. Thus, as part of the transformation process, some participants found themselves changing their thoughts an d opinions during the discussion (Boddy, 2005). Cohen et al. (2011) also emphasise the issue of homogeneity levels amongst the participants, in order to avoid superiority and dominance during the focus group discussion. Thus, all of the participants were post level one (PL1), meaning that they were all at the same level.

Furthermore, Krueger (1998) emphasise the significance of questions that yield powerful information during focus group discussions. This includes avoiding the use of dichotomous questions that need a 'yes' or 'no' answer. Open ended questions like 'what do you think/feel?' questions, are best. Krueger also asserts that 'think back' questions should be used, in which participants are first taken back to their experiences and then moved forward to their future plans. Thus, the questions designed for the focus group discussions were based

on what educators have been doing; how they have been doing what they have been doing and are still doing; why are they are doing what they are doing; and with what are they using to do what they are doing. All the information taken from participants was also recorded using a smart-phone and later transcribed for accuracy and precision. This was done with participants' permission and consent. Figure 3.4 below shows how and why the data were generated.

Figure 3.4 shows the three objectives of this study and the methods of data generation used to acquire information for each objective. It also shows the sources of data, the phases in which data were generated, as well as the rationale for the data generation plan for each objective of this study.
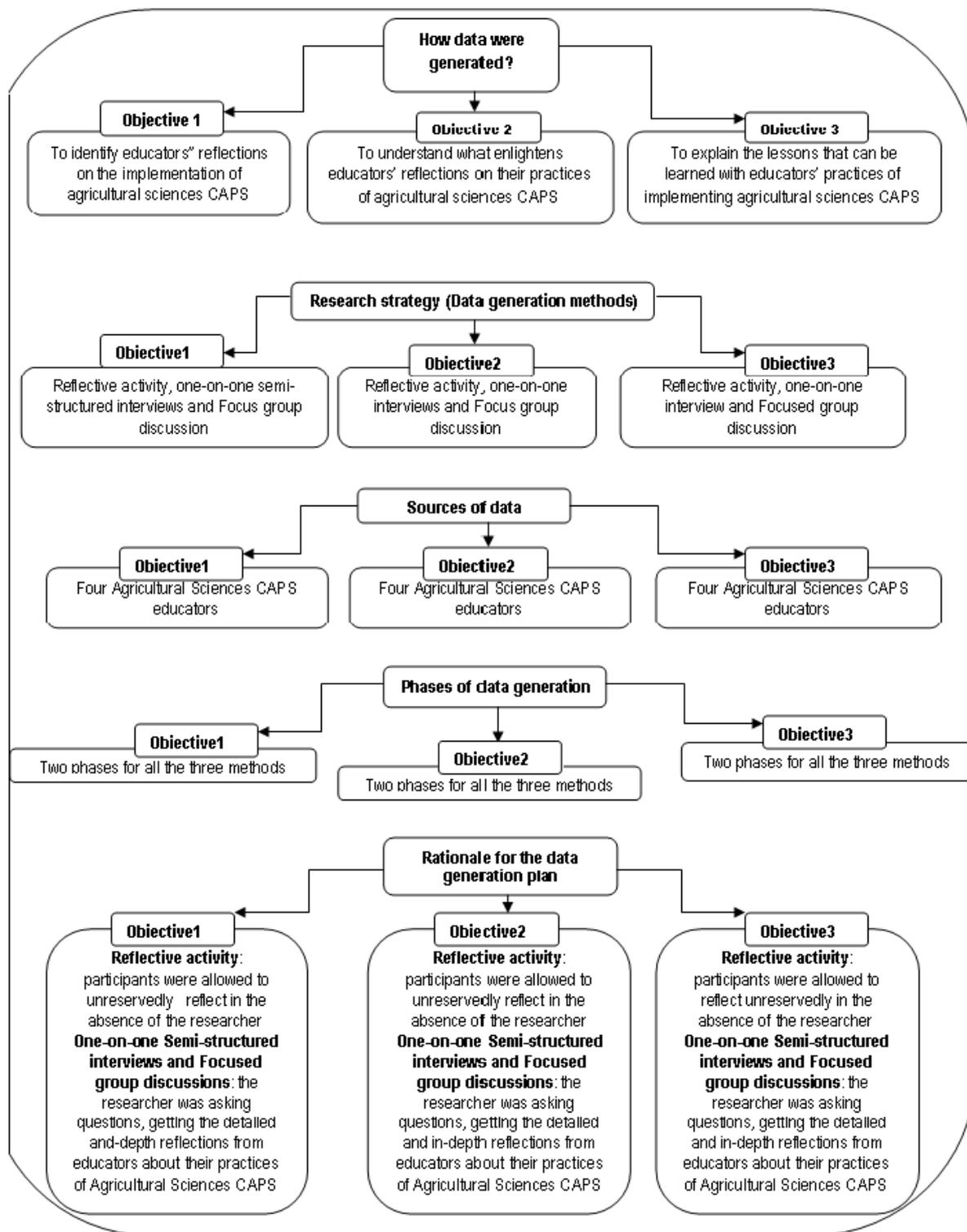
Figure 3.4: Data Generation Plan

3.6 Data analysis

According to Biggam (2011) data analysis is about organising the information, breaking it into manageable units, synthesising it and searching for patterns while discovering what is significant and what is to be learned. This is all done in order to decide what you, as a researcher, tell the readers. Thus, to make analysis of data easier, I made sure that the reflective activity, interview and focus group discussion questions reflected the main objectives and answered the research questions, in which these were aligned with the aim of this qualitative research which is to explore educators' reflections on their practices of Agricultural Sciences Curriculum and Assessment Policy Statement. This is accordance with an assertion by Cohen et al. (2011) that, qualitative data analysis is mainly about making sense of data based on the information given by the participants. The data also need to be classified or arranged into groups or classes based on common characteristics (Kothari, 2004). Thus, I distilled, from the participants' reflections, the assertions, explanations and understanding of their practices and their perceptions of what and how they implement the curriculum (CAPS) based on their naturalistic framework.

This qualitative action research adopted a guided analysis which encompasses inductive and deductive approaches. See a book by Christiansen et al. (2010) entitled 'Understanding research', in which qualitative data analysis is clearly explained to be categorised into two approaches: the inductive and the deductive. Inductive approach includes the logic of reasoning proceeding from particular facts to a general conclusion, while deductive involves inferences from general principles and related to logical deduction. Including the two approaches (inductive and deductive) in a guided analysis is in line with a description by Dhunpath and Samuel (2009) that it (guided analysis) is characterised by a priori judgement and through interaction with data. Thus, I also consider that my initial observations and at the beginning of the research, were part of the data analysis process. The informal discussions I had with the participants at the beginning of this study, during the planning stages, were also recorded so as to ensure that no information was lost.

Moreover, the inductive approach was utilised by synthesising the raw data and searching for patterns in order to draw conclusions. Through the reflective activity, semi-structured interviews and the semi-structured focus group discussion, I was able to detect the patterns

and draw conclusions from the results found. Based on the results, I then induced (inductive approach) the results to be in line with the questions rooted on the curricular archetypes. Categories were then set and delineated into data needed for the deductive reasoning. Moreover, open coding was utilised; open coding is defined by Cohen et al. (2011) as the new label that a researcher attaches to a piece of text to describe and categorise the piece of text. Hence, I guided analysis was utilised to code participants' responses in order to draw precise conclusions of this study. Conclusions were made after data reduction took place (Christiansen et al., 2010). The recorded data from the reflective activity, semi-structured interview, and focus group discussion was then reduced for the interest of data reduction. I then read the transcribed data and articulated the assertions in a language suitable for readers. Furthermore, the data lead me to establish themes or topics which assisted me to organise and group data into sets of topics.

On the other hand, transcribing data could be expensive and time consuming, especially to those researchers who employ people to transcribe data (Cohen et al., 2011). In addition, the scribe could also articulate the wording into his/her own word and that could cause misrepresentation of the results. Thus, I recorded the data using my own phone and transcribed the data myself in my own time. This allowed me to choose significant data directly from the original source as opposed to a mediated transcribed source. Through all this, ethical consideration was well recognised so as not to violate the participants' rights and free will.

3.7 Ethical considerations
A fundamental aspect of any research, whether quantitative or qualitative, is the ethical consideration undertaken during the process (Babbie, 1990). Creswell (2009) states that it is of paramount importance that any research follow a certain ethical and moral principles. These principles should protect the rights of humans from any harm that might be caused by the research. Nkohla, Gxasheka, Lyu, Qin, and Tyasi (2015) also state that, even animal research should take into account the welfare of the animals involved the research. This is due to the fact that fear and discomfort may arise during the course of the research, thus animals should also be treated in a humane manner (Tyasi & Nkohla, 2015). Thus, I had to apply for an ethical clearance from the University of KwaZulu-Natal before the research

began. This has to be done because ethics put more emphasis to human and animal dignity (Cohen et al., 2007; Nkohla et al., 2015; Tyasi & Nkohla, 2015).

Furthermore, I also requested permission to conduct the research in writing from the Department of Basic Education (DoBE) through the Ingwavuma circuit manager and Umkhanyakude District Director (refer to Annexure B). The permission for this study to be conducted and access to the three selected schools was granted by the Head of Department, KwaZulu-Natal DoBE (see Annexure D). After being permitted by the DoBE to conduct the study, I then requested written permission in writing from the schools principals to work with their Agricultural Sciences educators. The permission was granted (see Annexure A). Lastly, I visited the educators and sincerely requested them to participate in the research. I verbally explained everything about the study and after they agreed, I issued each educator with a consent form which also explained their rights to confidentiality, anonymity and status as voluntary participants. Each participant signed the consent form shown in Annexure C. This was in accordance with an assertion by Babbie (1990) that it is the researcher's responsibility to be granted permission to conduct his/her research and inform the participants about their rights. The participants have the right to privacy and confidentiality, thus the researcher should make it a point that participants are aware of such issues in order for them to provide the information confidently and with assurance on privacy.

Babbie (1990) together with Johnson and Christensen (2011) further states that in the concepts of informed consent, there should be ethical norms of voluntary participation and no harm to participants. Furthermore, the issue of benefits should be clearly understood by the participants in that there would be no financial benefits from the study and if they feel any discomfort, they were free to discontinue their participation at any given time.

In addition to the above, research conducted in an ethically sound manner enhances the trustworthiness and quality of the research (Strauss & Corbin, 1990). This is why, like many other professional studies conducted throughout the world, I had an obligation to adhere to strict ethical principles/standards. This study is aligned with the ethical principles employed

in any qualitative research, as it has respected autonomy, justice, informed consent, social value, validity and an independent ethical standard.

Moreover, the study received an ethical clearance certificate from the university of KwaZulu-Natal Humanities and Social Sciences Research Ethics Committee, after a proposal was developed and approved by the university, with the assistance of a supervisor (See Annexure E for the Ethical Clearance Certificate and all the terms and conditions of its validity). However, issues such as deception, where participants are not told that they are researchers and are sometimes promised of monetary benefits after the study, are a failure of ethical standards. Also, issues such as exposing the participants and the institutions they work in, are a barrier to ethical principles (Cohen et al., 2011). Thus, I first verbally explained the background, rationale and the objectives of the study. Also, the information generated will be kept by me and my supervisor for five years (then destroyed) at the Edgewood Campus Library, and will not be used without participants permission.

3.8 Trustworthiness, validity and reliability measures

Trustworthiness is the trait of deserving trust and confidence. This includes how the participants or addressees find a study worthy to be respected and given the attention it needs (Cohen et al., 2011). Guba and Lincoln (2004) suggest four propositions of trustworthiness viz; integrity, transferability, dependability, and conformability. Integrity is the truthfulness and reality of an information or study (Cohen et al., 2011). In this study, this refers to the reality and naturalistic nature of the findings as portraying what is really experienced by the participants. Thus, I generated data using three methods (reflective activity, one-on-one semi-structured interview and semi-structured focus group discussion) in order to get in-depth reflections of the participants' day-today experiences. Recording the data also ensured integrity/credibility of every datum generated in this study which was guided by the archetypical model that was common to every participant.

Furthermore, Henning et al. (2004) assert that trustworthiness of research makes a study rigorous, and validity is described by Lekalakala (2012) as a means of determining if ever the study truly measures what it intended to measure. In other words, the research objectives

should be able to be attained through the use of proper research instruments to generate data. Thus, the data generation methods indicated above facilitated the validity of this study. Lekalakala (2012, p. 49) further describes reliability as "the extent to which results are consistent over time as an accurate representation of the cases selected for the study". Cohen et al. (2011) refer to reliability as dependability while Guba and Lincoln (2004) also refer to reliability as validity. This is about giving accurate and direct information that portrays the actual living conditions lived by those who participate in the study. Thus, results from this study can be considered reliable if they can be reproduced under a similar methodology and set up. However, they cannot be used to generalise findings, but only represent the actual practices of the selected participants and selected schools in the Umkhanyakude district (Ingwavuma circuit). Results and recommendations from this study can be transferable and adopted not only by Agricultural Sciences CAPS educators, but by other educators who teach other subjects as well. This is due to the fact that, the curricular archetypes underpin how teaching and learning processes take place in any curriculum. Furthermore, since the participants also reflected on the policy document (CAPS) in general, this means that these reflections may assist each and every educator, regardless on the subject they teach. This does not leave behind curriculum developers, who are office educators. They may be assisted as well since CAPS is a national curriculum statement for South African schools.

3.9 Limitation and potential challenges

Marshall and Rossman (2006) assert that each and every proposed study, there are limitations and that no method is innocent than the other, and no study is perfectly done without limitations. This study is not an exception to that, and the fact that results from this study cannot be used to generalise and present practices of all Agricultural Sciences CAPS educators, this study resorted mainly to trustworthiness, validity and reliability. The mere fact that I personally knew all the educators who were participants in this study and we all teach in the same cluster, rises a possibility of biasness and persuasive attempts to encourage them to give information based on my personal interests. This would mean, I would not be allowing the participants to give information based on their naturalistic reflections. So, in order to overcome this challenge, I gave the participants the reflective activity to go and do them during their free time. During the one-on-one semi-structured interviews, I first asked the participants to tell me a story about their experiences as educators. This allowed them to

also speak from their subconscious mind in order for me to get their in-depth day-to-day experiences.

Furthermore, like most qualitative research studies, the sample size is small and therefore findings cannot be generalised. Thus, they are subjective, personal, and contextual. Using interviews and focus group discussions as means of generating data can be expensive and time consuming due to the locality of schools and also proximity of schools to main roads which hampers accessibility for participants. To minimise this, I selected schools located in the same vicinity with my school, and for the focus group discussion, a school that is central to everyone was used as a venue for easy access. However, interviews also reported have their disadvantages. These include production of information that is not in line with the study's focus and/or objectives;   missing information when simultaneously recording information whilst listening (Biggam, 2011; R. Bogdan & Biklen, 1992; Rabionet, 2011). To overcome this, I recorded the interviews, in which later I transcribed them in order not to miss any information that might be of significance for the study.

3.10 Conclusion

This chapter elaborated on all the details of the research design and methodology ranging from research paradigm, research approach, sampling, data generation, analysis, their advantages and disadvantages, ethical considerations, trustworthiness and limitation of the study. All these methods clearly outline how this study was conducted and how it intends to answer the research questions and attain the aim of the study which is to explore educators' reflections on their practices of Agricultural Sciences CAPS. Chapter 4 will present the research findings through discussions that follow the data analysis described earlier in this chapter.

CHAPTER 4

Findings and discussions

4.1 Introduction

The research design and methodology is comprehensively outlined by the previous chapter (Chapter 3) and this chapter logically describes the findings of the data that were generated through the methods outlined in Chapter 3. The archetypical model selected for this study was used as a base to present the research findings. The curricular archetypes are used as strands for the presentation of data. The four participants (S1, S2A, S2B, and S3) from three schools (S1, S2, and S3), in which school S2 had two participants (S2A and S2), were included for data generation. In order to ensure that the participants' voices are not lost, verbatim quotations will be used during data presentation. Consequently, the study was guided by the following research questions that guided the process of data generation:

1. What are educators' reflections on the implementation of the current South African Agricultural Sciences Curriculum (CAPS)
2. What enlightens educators' reflections to be the way they are about their practices?
3. What lessons can be learnt with educators' reflections in implementing Agricultural Sciences CAPS?

The data that addressed these questions were generated through reflective activity, one-on-one semi-structured questionnaires and semi-structured focus group discussion. This chapter will articulate the educators' reflections in both of the phases (Phase 1 and 2) in which the data were generated and how educators (participants) improved from their reflections on their practices. Several studies assert that, when one reflects, you improve your practices and in any practice there is always room for improvement (Cohen et al., 2011; Khoza, 2015c; Larrivee, 2000; Mbajiorgu et al., 2014; Van Manen, 1977; Zeichner & Liston, 1987).

4.2 Findings and discussions

4.2.1 Theme 1: Rationale
- ***Why do you teach Agricultural Sciences?***

Phase 1

The rationale as to why participants taught agricultural sciences aimed to find out what enlightens their teaching of the subject. During the first phase of reflections, participants were unclear about the prepositions or functioning words or archetypes that rationale constitute(s). The participants had to reflect on the personal rationale (psyche reflection), societal rationale (pragmatic reflection), and professional rationale (performance reflection), but none of them reflected on all the three of the functioning archetypes of rationale (in Phase 1). Participants S1 and S2A only reflected on psyche reflection by indicating that they both taught agricultural sciences because they enjoyed working with soil, plants and livestock animals. S2A further justified this reasoning by saying *"... because I believe in using natural resources without misusing them"*. S3 reflected on performance or professional, and pragmatic or social level by saying *"I am qualified to teach agricultural sciences and life science, but FUNZA LUSHAKA bursary scheme appointed me to teach agricultural sciences because of my qualification. I have a BSc in Agricultural Sciences and a PGCE qualification"*. S2B also reflected on psyche level by mentioning that, "*I love agriculture and wish to see uplifted food security in communities*". S2B also said, "*poverty needs to be uprooted with all its manifestation in rural areas*" (pragmatic reflection). However, S2B did not mention anything about the competence level or qualifications (performance reflection) in teaching the subject.

However, during the second phase of reflection, all the participants were well aware of the functioning words of rationale and reflected on all of them. Phase 2 reflections were as follows:

***Personal rationale:* Psyche reflections**

Participant S1: "*I have passion in agricultural sciences, and loving it always makes me want to encourage learners to love it the way I do. I enjoy the subject and when I am in class, I always feel the intrinsic drive and energy I always want to instil in my learners*".

Participant S2A: "*I admire nature and I have a growing urge to understand how plants and animals behave. Agricultural Sciences is just interesting since I get to understand how my own livestock animals at home behave because I am also a subsistence farmer. Agriculture is my life*".

Participant S2B: "*I live agriculture, I eat agriculture, I sleep agriculture, I breathe agriculture and I am agriculture. I ate today because of agriculture; I am wearing clothes today because of agriculture. So, agriculture is life to me, my family and to everyone. This is why I am enjoying teaching the subject*".

Participant S3 did not have any personal rationale to teach the subject because the only reason was the qualification and means to capacitate learners with necessary skills and knowledge in order to be competitive in tertiary level.

Furthermore, the above reflections clearly outline that S1, S2A, and S2B share the same sentiments pertaining to why they were Agricultural Sciences educators, while S3 only wants learners to be academically competitive. This is in line with an assertion by Klate (2008) that some educators choose to care about their personal feelings while others are more concerned about professional identity and ignore their personal perspective of a subject. This suggests that, whether S3 liked the subject or not, that didn't matter, the main focus was/is to deliver the content and make sure that learners learn and learners know, because qualifications in agriculture qualifies one to teach agricultural sciences, regardless of their attitude. This is in accordance with an assertion by Khoza (2014a) that, educators may not be influenced by all the three functioning words of rationale to teach a particular subject. Thus, the rationale of S3 to teach agricultural sciences had nothing to do with personal attitudes. However, Pitts (2000) believes that skills should always be balanced with personal attitudes. This suggests that psyche reflections are very important during teaching and learning.

Moreover, this clearly implies that there are still educators who view teaching from a personal perspective, while others view their practices through the competence and performance approach.

***Societal rationale*: Pragmatic reflections**

Participant S1: "*I engaged in teaching agricultural sciences because I was willing to assist when an agricultural sciences educator left the school and there was no educator for the subject. This was also influenced by the fact that I was raised by parents who loved farming and always emphasised the significance of growing crops and raising livestock. I also want*

*to see young people farming at home (subsistence farming) than always relying on buying vegetables when they have gardens at home***".**

Participant S2A: *"I want learners to learn to do things on their own and start community project/cooperatives to fight poverty. The wave of drought in the province and country at large lead to elevated food prices; therefore since we are in rural areas and the socio-economic status is low, small-scale farming can be our rescue for low income earning families".*

Participant S2B: "*learners should be taught the importance of agriculture in our day-to-day lives. Teaching the subject gives me a platform to induce consciousness to children and encourage them respect agriculture because it is life".*

Participant S3: "*When learners are equipped with the necessary skills, they can use the skills for the upliftment of their livelihoods. Thus, I teach agricultural sciences to equip learners to be competitive and make differences in their society, varsities, and workplaces".*

Seemingly all the educators show commitment in promoting community development through teaching agricultural sciences. This suggests that, societal rationale influences the teaching of agricultural sciences. This is also reported by Freire (1985) who was a pragmatist and advocated that the environment in which someone lives influences their daily practices at school. This can be seen in the reflection of S1 who was raised by a farming family and as such the passion of farming grew within the participant through the experiences at home, thus the participant taught agricultural sciences. Furthermore, look at how the wave of drought has negatively affected farmers as producers, and ordinary people as consumers, particularly in KwaZulu-Natal, Eastern Cape, Free State, and North West provinces. This brings a call to incorporate what is experienced by our societies (pragmatic approach) into the classroom curriculum. Such reflections of incorporating our social experiences into our formal education is viewed by Stenhouse (1975) as a positive approach to unlocking micro and macro social challenges.

Content rationale: **Performance reflections**

Participant S1: *"I am not qualified to teach agricultural sciences since I am not in possession of a qualification in agriculture, but I have a teaching certificate I did more than twenty years ago. I strongly believe that experience is the best teacher and because I have been teaching the subject for more than ten years, I am qualified to teach it. I even produced 92% pass rate last year, 2015. Thus, the experience, knowledge, and the results I am producing in the subject gives me confidence and encouragement enough to continue being an agricultural sciences educator".*

Participant S2A: *"I am teaching Agricultural Sciences because I have a diploma in agriculture and a teaching diploma"*.

Participant S2B: *"I am teaching Agricultural Sciences because it is closely related to life science subject and I am qualified to teach life sciences, not agricultural sciences. However, the content in CAPS is linked or correlated between the two subjects. Thus my principal said I should also teach the agricultural sciences".*

Participant S3: "After completing my BSc Agriculture degree in 2012, I got an SGB teaching post (in 2013) in the secondary school I used to go to, in which I taught Agricultural Sciences. Before the end of 2013 a qualified educator was appointed and losing my job at that time made me realise that I needed to do a Post Graduate Certificate in Education. I am permanently teaching now because I am qualified and have a stable monthly salary".

The reflections (performance reflections) on content or professional rationale clearly show that one may teach a subject without being in possession of an appropriate qualification. See S1 who got a pass rate of 92% in National Senior Certificate (NSC) results but does not have a qualification in agricultural sciences. This is also aligned to the Stenhouse's process approach that indicates that, the best practices that yield good quality learning outcomes (or results) in education are unlikely to come from research experts who only rely on scientific literature and do not recognise the experience of those who have been in the field (teaching) for a long time. Stenhouse (1975) asserts that he does not have faith in experts being able to scientifically investigate and come up with choices of knowledge and skills that are appropriate for all educators and learners. Thus, the teaching experience of S1 played a crucial role in harvesting good quality results, even though there S1 does not have

professional qualification to teach Agricultural Sciences. Furthermore, Hoadley and Jansen (2013) indicate that there should be a correlation between subjects of the same stream. For instance, Agricultural Sciences content should be linked to Life Sciences, and chemistry component of Physical Science subject. This will then promote team work amongst educators. This is aligned to the reflection by S2B who finds it easy to teach Agricultural Sciences topics that are found in other disciplines as well, such as nutrition, genetics and reproduction that are also covered in life science subject.

From the data generated through the two phases of the reflective activity, semi-structured one-on-one interviews, and focus group discussion, there was an observable transformation in terms of the educators' consciousness about their rationale to teach agricultural sciences. The transformation means that they learned and understood factors they did not recognise much that underpin their teaching practices. In Phase One, three of the participants (S1, S2A, and S2B) reflected through psyche reflections while S3 only reflected through performance reflection. This suggests that S3 focused on learning outcomes and that learners should be taught the subject matter and one should possess a qualification to teach. One's personal feelings/attitudes (psyche reflection) and societal rationale (pragmatic reflection) mattered not, as long as someone had a qualification and the end. According to Hoadley and Jansen (2013), performance reflection will be aligned to performance curriculum where personal opinions and local day-to-day knowledge have no room to stay. This is also in accordance with an assertion by Tyler (1959) that psyche and pragmatic reflections have no room in curriculum development because a good curriculum is guided by specific objectives (objective approach).

However, even though educators were aware of the three functioning words (personal, social and performance) of rationale, the main reasons of teaching agricultural sciences were still infused between personal and social factors, with strong emphasis on community development (pragmatic reflection). Despite how the educators felt about the subject, we still receive a sense that CAPS is organised in such a way as to create linkages with other subjects. Thus, S2B was able to teach agricultural sciences without any difficulties, even though the educator does not have an appropriate agricultural sciences qualification. CAPS is aligned with the performance/vertical model of curriculum that focuses primarily on the

hierarchy of topics to be taught (Bernstein, 1999); a high level of understanding of the subject is key for success in the implementation process. Thus, educators need to think critically because critical thinking is closely related to content knowledge (Hoadley & Jansen, 2013; Zeichner & Liston, 1987). Allowing the educators to read agricultural education articles, primarily on curriculum development, improved how they perceived agriculture as a subject and also as a component of living.

Furthermore, during the focus group discussion, a positive statement that '*we should make agriculture fashionable*' gave hope and an insight that, despite the stigma that agriculture is for rural and less civilised people, educators showed enthusiasm to transform the subject and even change the mindset of learners to be optimistic about the subject. The articles on agricultural education that I gave the educators to read seemed to have transformed how they perceived the subject (Agbulu & Ademu, 2010; Boone et al., 2006; Kabugi, 2013; Nkohla et al., 2015; Ochieng'-Konyango & Asienyo, 2015; Suleiman & Barry, 1997; Thobega et al., 2011; Tyasi & Nkohla, 2015; Waithera, 2013; Wilson et al., 2002). To mention a few comments, participant S3 was impressed by a practical agricultural research conducted by Tyasi and Nkohla (2015) who validated efficacy effects of a medicinal plant, *Elephantorrhiza elephantina,* that is mainly used by communal farmers to treat gastro-intestinal parasites in goats. Participant S3 commented, "*We need to produce learners that will also be able to take the knowledge or information and skills taught in class and come with remedial strategies affecting our societies, particularly rural communities, through research*". S1 also added "*the review by* Nkohla et al. (2015) *is informative and I can use some aspects of animal health, welfare, and husbandry in my agricultural lessons*"

Furthermore, a phenomenal and admirable reason for teaching Agricultural Sciences (from all the educators) was the mission to equip learners with necessary knowledge and skills in order for them to improve rural livelihood through food security. This suggests that educators are also concerned about linking what is prescribed in the policy document with the needs of the society and the workplace at large (societal rationale). According to Van Manen (1977), one of the curriculum aims should be the means to unlock social and political challenges. This encourages educators to reflect pragmatically, as CAPS (2011, p. 4) also indicates that the aim of the policy statement is to "equip learners, irrespective of their socio-economic

background, race, gender, physical ability or intellectual ability, with knowledge, skills and values necessary for self-fulfilment, and meaningful participation in society and citizens of a free country" and also "facilitating the transition of learners from education institution to the workplace". In other words, educators are educating learners to play significant roles in their respective societies and be responsible citizens.

4.2.2 Theme 2: Goals
- ***Towards which goals are you teaching Agricultural Sciences?***

Phase 1

Reflecting on goals intended to find out how well-informed educators are about the aims, objectives and learning outcomes. The three archetypes (aims, objectives and learning outcomes) are functioning words of goals toward which they are teaching Agricultural Sciences. These functioning words are attached to the prepositions of reflections, as the phenomenon of the study. Thus, the educators had to reflection on the aim (psyche reflection), objectives (pragmatic reflection) and construction of outcomes (performance reflection). However, none reflected on all the three positions of reflections during the first phase of data generation. All the participants said they want to equip learners with skills in order for them (learners) to practice agriculture in their communities. Participant S3 said, "*I want my learners to do agricultural studies at tertiary and be businessmen-and-women*". Participant S1 shared the same view by indicating that, "*I want to see learners being self-employed as we are facing challenges of unemployment in South Africa*". These reflections (psyche and pragmatic) were from the reflective activity and semi-structured one-on-one interviews. However, S3 during the one-on-one interview also said, "*I want to get the experience and become a subject advisor for Agricultural Sciences. I also want to further my studies and contribute significantly in Agricultural Sciences curriculum development*". The sense of self-enrichment observed from participant S3 intertwines psychic and pragmatic perspective of reflections. None of the educators reflected on specific concepts/topics of the subject.

Furthermore, Berkvens et al. (2014) assert that, this issue of lacking consciousness of educators on curriculum goals is becoming an increasing worldwide challenge, and Khoza

(2015d) further said that this needs to be addressed before quality teaching and critical thinking can be promoted. As a result, educators educate learners without identifying and understanding relevant subject visions and goals (Khoza, 2015b). Reflections as integral part of quality teaching and critical thinking should be done on all the three positions (psyche, pragmatic and performance). Thus, there was a need to inform educators about curricular archetypes and provide articles on reflections for them to read in order to be aware of performance reflections. In addition, this made them aware those teaching-learning outcomes that are examined from the side of learners.

During Phase Two of reflections, a huge improvement was observed which clearly showed that educators needed to be, and were, transformed and the study's objectives were met. Phase 2 reflections were as follows:

Aims: **Psyche reflections**

Participants S1, S2A, and S2B shared the same sentiments of envisioning learners as responsible citizens and self-employed in the long run. They all mentioned that they wanted to see farmers or entrepreneurs who are more likely to be job creators than job seekers from their learners. Furthermore, S1 showed some sense of flexibility by not narrowing only envisioning agriculturalists by saying "…*I do not only want to see farmers, but doctors, scientists, engineers, ministers and tenderpreneurs*". These reflections clearly show the long term intentions of educators, as aims are defined by Berkvens et al. (2014), Kennedy et al. (2006) and Khoza (2013b) as long term goals that are anticipated to be attained.

Participant S3: "*I want agriculture to run in their (learners) veins and be able to practice it even if they pursue studies in other disciplines/fields. A backyard garden should always be present and productive, through the skills I teach them*".

The above reflections (psyche reflections) on aims reveal the broad intended goals to be achieved on educators' perspective, and this is aligned with an assertion by Kennedy et al. (2006) that they (aims) are broad statement of teaching targets an educator will have in his/her subject. Thus, an aim is from an educators' point of view.

Objectives: Pragmatic reflections

Participants could not clearly understand the difference between aims and objectives as the long term and short term goals, respectively (Kennedy et al., 2006). Furthermore, their reflections were based on the objectives of the lessons, which included what learners were expected to be able to do. This gave them another challenge of differentiating between objectives and learning outcomes and they (learning outcomes) are what learners know and are able to do, after a lesson (Kennedy et al., 2006; Khoza, 2013b). However, I was noted transformation on how they all articulated their pragmatic reflections. See the reflections below:

Participant S1: *"It starts with passing the subjects and for them to do that they must understand all the concepts taught in class, and must be able to differentiate land and soil, animals and livestock, agricultural labour and agricultural labourer, marketing and selling and lastly cattle and cow. These concepts are used almost in all levels (Grade 10 to 12) of agriculture and I believe even at tertiary level, it is important for learners to understand them"*.

Participant S2A: *"I want learners who do not just pass agricultural sciences with average aggregate, but with flying colours because they practice it daily at their homesteads. We are in rural areas and most of their (learners) keep livestock and planting gardens, so it is very easy to relate what we do in class and what they do at home. The only section that could be challenging to them is genetics because it is the most complicated and too much scientific since it deals with genes and other microscopic processes. For instance, genetic medication can only be done in the lab by professionals so I can only show them videos in order to visualise and be able to understand and differentiate the processes involved"*.

Participant S2B: *"When I teach, I first ask what they know so that the lesson flow can move from known to unknown in order for me to know where to put more emphasis, depending on what I feel they should know and mostly asked in examinations. Fortunately, I am also teaching them life science which is strongly linked to agricultural sciences and in most cases some topics such as reproduction and genetics are taught in a parallel sequence. Thus, I want them to be able to link animal with human reproduction systems. They should be able to understand the reproductive behavioural signs of animals so that they can assist in growing their parents' livestock animals. For an example, they should be able to observe the signs of*

oestrus in females and lack of libido in males, together with signs of female animals ready for parturition (giving birth) as they are similar to the ones of human beings".

Participant S3: *"...most of all, I teach them to pass exams. Teaching learners things that happen in their real life situation but not relevant to the curriculum and what is examined is nonsense. I mainly take question papers and teach according to what is commonly asked in order for them (learner) to understand and get used to the exam questioning style, and how they should attempt questions. It is pointless to make them understand what is even sometimes difficult for me as an educator to understand. Therefore, if it means that they (learners) have to be taught to memorise some concepts and processes in order for them to pass exams, then I will teach them how to memorise. Examinations are more about passing than understanding. Thus, I want my learners to be able to define terms, describe them, list, explain, summarise, and deduce from abstracts and case studies. Most of these aspects need learners to cram or memorise because the memorandum at the marking centre leaves no space for general knowledge [understanding] but wants learners to produce precise and straightforward answers. Therefore, I want learners to pass and go to varsities with good percentages in agricultural sciences".*

Participants S1 and S3 have similar pragmatic reflections that focus primarily on mastering the subject matter and passing to get good tertiary entry results than. This suggests that these educators indeed implement curriculum and follow the vertical approach of curriculum that is rooted on performance (Bernstein, 1999). Participant S3 indicates that there is less room for artistic and pragmatic approach to curriculum in CAPS because time is a constraining factor. In addition, teaching what you as an educator feel it's best for learners to know and be taught, based on their daily experiences as indicated by Eisner (1979) and Dewey (1933) in artistic and pragmatic curriculum, respectively, is futile for learners academic progress in the current curriculum, CAPS.

Furthermore, participant S2A and S2B are strong believers of pragmatic and artistic approach, as it is evident from their objectives of teaching agricultural sciences that are mainly linked to day-to-day experiences. This reveals that, in as much as CAPS is implemented, they (S2A and S2B) do however open a room for enacting CAPS which is a

curriculum that is instrumental in nature of approach (Tyler, 1959; Van den Akker et al., 2009). Moreover, a recognisable and substantial glimpse of inventiveness of using a communicative curriculum approach is observed from S2B's technique of teaching Life Science subject complementarily with Agricultural Sciences in order to induce understanding and transfer knowledge into learners. S2B also said, "*Genetics and cell division (mitosis and meiosis) is the same, and will remain the same regardless of the subject in which you are teaching them. In Agricultural Sciences, there is genetics, as well as in Life Sciences*". S2B is also using Lawrence Stenhouse's process approach to curriculum, as explained by Hoadley and Jansen (2013).

Learning outcomes: Performance reflections

Participant S1 reflected in much the same way as S2A and S2B as they all indicated that, after every lesson they informally ask learners to describe what they've heard or grasped from the day's lesson. S1 however said: "*they may not all say something because of time, but at least I try to further explain in case those who've spoken misunderstood some of the things I had said, and this assists those who might have also misunderstood some concepts*". Participant S3 said "*I always make sure my lesson planning leaves about ten minutes before the lesson ends, so that I can take one or two questions from a previous exam paper and we all try to answer in class*". All the educators also indicated that they do give short class work and if time is still available learners exchange exercise books and mark each other's work while they (educators) do the corrections with learners. However, S3 did not reflect much about learning outcomes in both the reflective activity and the one-on-one interview, and said "*the objectives explains everything what I expect learners to be able to do and know after my lessons or at the end of the year*". During a focus group discussion, the participants also indicated that they sometimes have unlabelled diagrams in charts in which learners will need to add labels after a lesson. Furthermore, S1 also reflected that, since they do have a projector in their school, after showing learners some videos the learners sometimes have to do a write up, reporting on what they have learned from the video.

However, during the one-on-one interviews and focus group they all mentioned that they wish their schools had all the apparatus and resources such as a microscope for learners to see

and draw the animal and plant cells, viewing them directly on the microscope. They also wished they had chemistry kits for the Grade 11 syllabus so that learners could combine reagents and mix chemicals in order to see the litmus paper changing colour in acidic, neutral, and basic mediums. Educators also wished CAPS had allocated time for agricultural sciences learners to go to school gardens to plant crops and follow the scientific procedures such as intercropping interval, methods of fertilizer application, appropriate depth of a seed bed, how to irrigate, and also to visit farms to handle animals by doing all the animal husbandry practices on their (learner) own.

Furthermore, from the reflections (on goals) above, it is evident that most educators teach without understanding and setting precise goals for their subjects. This is because the educators in this study were first unclear about the teaching goals and the accompanying functioning words. According to Carl (2012), setting precise goals can contribute to the smooth running of a programme and make effective use of available time. Thus, agricultural sciences educators, in actual fact all educators, should relate subject goals to the content, activities and assessment methods. Educators, don't seem to be able to clearly differentiate between aims and objectives, and this is aligned with an assertion by Khoza (2014a) that most educators did not understand how aims were different from objectives. Failing to understand and set proper aims negatively affects the attainment of learning outcomes (Kennedy et al., 2006). This will then fracture the link between intended, implemented and attained curriculum.

Moreover, findings from this study reveal that some educators have less knowledge that CAPS is guided by aims and objectives, and is primarily a performance curriculum and is vertically orientated. Tyler (1959) refers to the curriculum approach guiding a performance based curriculum, like CAPS, as a technical or product approach to curriculum development, while Van den Akker et al. (2009) refer to it as an instrumental approach to curriculum development. Additionally, agricultural sciences is a handy subject where most of its learning outcomes should not only be based on what learners know, but also what learners can do (Kabugi, 2013). The fact that the 'doing' part is a challenge in most schools, particularly in remote areas, justifies the pragmatic reflections from participants S3 and S1 that learners should just study to pass examinations and go to tertiary institutions. This means that the

intended learning outcome specified by Agricultural Sciences CAPS (2011, p.8) that is to produce learners who will "*develop an awareness of the management and care of the environment, natural resources and the humane treatment of animals through application of science and technology*", cannot be attainable by most learners. This suggests that CAPS document itself does [by design] not create the necessary structure for success. So, by not allowing room and time for practical application it hasn't allowed for success. Therefore, as long as CAPS does not fit in time for practical work in the Annual Teach Plan (ATP), some educators will continue using teacher-centred approach, while others such as S2A and S2B continue employing Elliot Eisner's artistic approach and follow their intuition to incorporate what can also be educationally relevant.

Lastly, the above reflections on goals brought forth a sense that educators' goals may be aligned to the curriculum's, but may change due to the feasibility and practicability of attaining them. This therefore, this suggests that educators could also have different goals from those specified by the policy documents. Thus, educators should be given time to reflect on their teaching goals in relation to their practices so that they are able to align their practices and goals with the curriculum.

4.2.3 Theme 3: Teaching and assessment activities
- ***Which activities are you using to teach and assess Agricultural Sciences?***

Phase 1

Teaching and learning constitutes activities leading to the attainment of the goals, as discussed in section 4.2.2 above. Reflecting on activities should then reveal every form or type of activities that facilitate and correspond with the content that will be discussed in section 4.2.4 later. CAPS (2011) prescribes three types of activities used to assess learning: informal, formal, and continuous assessment activities. The informal as processing formative activities; formal as interval activities and; continuous as uninterrupted activities are entrenched on psyche reflections, pragmatic reflection and performance reflections, respectively. However, the participants did reflect on formal interval activities (pragmatic reflections) and continuous interrupted activities (performance reflections) during the first phase of data generation.

Participant S2A: said "*I rely on class works, homework, and presentations*", and participant S2B and S3 also included the monthly tests they give learners. They indicated that they normally give one test per month and rarely gave more than one. Participant S1 mentioned class work, homework, monthly tests, and assignments, but did not indicate whether the assignments were part of the formal and continuous assessment tasks. This indicates that participants were not considering the formal activities as part and parcel of the daily teaching-learning activities. Furthermore, this implies that the selected educators disconnected formal interval and continuous uninterrupted activities from processing formative activities, when in actual sense they (activities) all complement each other. This suggests that they should be employed interchangeably without loss of function of the other. Thus, the participant had to be transformed and given another chance to critically reflect in the second phase.

Phase 2

Processing formative activities: Psyche reflections

All the participants indicated that they give class work, homework, and monthly tests as part of the teaching-learning activities. Participant S1 also said: "*allowing learners to sit in groups facilitates the teaching and learning processes because when they are in groups, they do assist each other as sometimes some explanations are better understood from peers than from educators*". The setting of grouping learners promotes critical thinking as they exchange ideas more effectively in small groups than in class discussions (Webb, 2009). Participant S3 had a similar reflection by indicating that, "the top performing learners usually sit together, and as a result they become dominant and vocal over the others, so when I group them I make sure I assign the top performers to be leaders of different groups and the slow learners to be scribes and presenters".

Interval activities: Pragmatic reflections

The fact that interval activities are done uniformly by every educator, particularly those who work in schools located in the same cluster, mean that they employ common activities/tasks to learners. The participants indicated that, they meet every term to set common interval

activities for their schools. From time to time, they meet as a cluster to discuss interval activities such as assignments, practical investigations, research projects, and exam tests (together with the dates) to issue them to learners. Hence pragmatic reflections were similar in all participants. Participant S2A said "*I am a cluster coordinator and so I coordinate the setting of formal activities, particularly the task and test based assessment activities for Grade 10, 11 and 12*". S3 added by saying, "*…these activities are prescribed by CAPS and the suggested dates are clearly stated in a programme of assessment in which all cluster members must abide to.*" S2A also indicated that the test based assessment activities for Grade 12 are set provincially for terms 1 to 3 and the final examination for NSC is set and marked nationally.

Continuous uninterrupted activities: Performance reflections

Continuous uninterrupted activities, as the recoded interval activities, are combined in a CASS form (from term one up to term four, uninterruptedly). S1 said: "*I combine and convert learners' marks based on the CASS form issued by the department of Basic Education, and the activities contribute in each learner's summative mark*". These performance reflections are in line with a report by Taole (2013) that the formal and uninterrupted teaching-learning activities determine if learners will proceed to the next grade or not. Formal and uninterrupted activities are also a measure of curriculum success since their results (learning outcomes) are the ones used to make statistics about the progress of learners in a particular curriculum.

The data generated indicated that educators were aware of the informal (psyche reflections), formal (pragmatic reflections), and continuous (performance reflections) activities even though during the first phase they did not reflect on pragmatic and performance reflections, as part of teaching activities. Activities given to learners should promote critical thinking processes hierarchically aligned with Bloom's cognitive taxonomy (Kennedy et al., 2006). This suggests that the quality of activities employed in class can either build or destroy learners' level of cognition. Thus, Stiggins et al. (2007) asserts that educators need to be aware of the hierarchy of the cognitive domain and should be able to give learners activities with some action verbs colligated to the various levels. Khoza (2013b) further asserts that the

uninterrupted activities then become a collection of different sets of summative activities that are used in generating marks for grading learners without any processing or formative help that allows learners to improve from the feedback. It is for this reason that continuous activities are regarded as uninterrupted teaching activities.

Furthermore, during the two focus group discussions the participants raised concerns regarding the number of processing formative activities prescribed by the department of education to be given to learners. They indicated that a minimum of two class work and two homework assignments should be given, in which they argued that time is limited for them to mark and do corrections with learners yet the ATP prescribes dense content to be covered. Thus, they end up using teacher-centred approach most of the time when teaching Agricultural Sciences during teaching. Reflections on time will be discussed in section 4.2.9 below. On top of that, CAPS does not specify informal activities to be done, so educators take any activities that they find relevant from text books and study aids issued by provincial department of education during educator workshops. S3 also said: "*it is better to take informal activities from pervious question papers because sometimes the ones in textbooks are weak and do not train how learners should attempt and pass examinations*". Some suggested that, CAPS should also prescribe processing formative activities because some educators, especially new educators who do not have experience and do not have the artistry of deciding which activities are good for examination purposes. The second phase of the semi-structured focus group discussion took longer than anticipated, as participants were showing signs of being transformed and was conscious about teaching and learning activities, together with effective teaching methods. A rigorous reflection (during the focus group discussion) was evident when S3 said: "*let us not deny the fact that, as much as we would love to give activities for these learners to be critical thinkers, problem solvers and responsible citizens, it is meaningless to seek societal relevance when they are still failing examinations. We teach them to pass more than being responsible citizen, and that is an undeniable fact. That's my opinion and that mindset has led me to harvest 100% pass rate in 2015. But many schools I know struggle to even reach 60% because educators seek societal relevance*". This suggests that, there is still a strong need to engage educators more into reflecting on teaching and learning activities, and the relevance of the content taught.

4.2.4 Theme 4: Content and time

- *What (content) and when (time) are you teaching in agricultural sciences?*

Phase 1

All participants had similar reflections on content during the first phase. They all indicated that in Grade 10 they taught ecology and soil science, in Grade 11 it was content on plant studies and Grade 12 syllabus covers animal studies, agricultural production, and business management. The similarity was due to the fact that all agricultural sciences educators are given the same Annual Teaching Plan (ATP) with specific topics to cover. None of them discussed how knowledgeable (performance reflection) they were about the contented they were taught. Participant S1 however said: "*I also like animal studies because it teaches us about how animals behave in different conditions*". This reflection was based on personal interests (psyche reflections). This suggested that the participants needed to be educated about the three archetypes or functioning words of content viz. topics, experiment/practical and subject knowledge together with their specific reflections prepositions which are psyche, pragmatic, and performance reflections.

Furthermore, they all indicated that agricultural sciences, like all other subjects, is allocated four hours a week and the time allocated is not enough because there are other school activities such as in-school and union meetings, social events, and sports which disrupt teaching and learning. In the meantime, ATP is constant and one has to find ways of catching up with the lost time. During the focus group discussion, a comment was made that, if extra hours were paid for, just like other work field that pays for working extra hours, educators would be motivated to conduct lessons even after school hour.

Allowing the participants for Phase Two reflection was entrenched on an assertion by Kehdinga (2014a) that reflections should be based on personal (psyche) factors, societal (pragmatic) factors, and professional (performance) factors in order for them (reflections) to promote the theorising processes. **Phase 2** reflections were as follows:

Participant S1 said: "*I enjoy animal behaviour studies the most, as it entails content that is relevant to real life situations and most of what is taught to learners, then can see it in real life situations, which makes this section enjoyable to me as an educator and to learners*". This reflection (psyche reflection) reveals that there are topics that educators favour more than others. This is evident from the reflection made by S2B that was similar to the one by S2A and S1, that "*the organic chemistry chapter in Grade 11 syllabus is a huge challenge to me and to the learners, particularly those who are not doing physical sciences. They have a negative attitude towards chemistry since they claim that they did not run away from physics to do it in agricultural sciences*". S1 added: "*…what is worse I did not do chemistry during my teaching training, so it takes me some time to prepare and to teach, particularly those who are slow learners. As a result I sometimes consult a physical sciences educator to assist me in chemistry sections*". This suggests that S1 was not well knowledgeable about the chemistry component, and Boone et al. (2006) indicates that the inclusion of chemistry and biotechnology in agricultural sciences disadvantages those who did not do courses in these at tertiary or colleges. The issue of content knowledge is central in teaching because educators are the primary sources of knowledge, so if they are not competent, there is no way learners can master a subject (Agbulu & Ademu, 2010; Keys & Bryan, 2001).

However, it was only Participant S3 who did not have a problem with the chemistry chapter, but specified that "*… chemistry and genetics are the learners' worst nightmare*". Participant S3 also added: "*I did physics and chemistry courses as part of my BSc degree and I have no problem with the content, although it takes me a longer time to teach organic chemistry structures like alkanes, alcohols and carboxylic acids because to some learners you need to explain what an element is*". Wilson et al. (2002) agree with this by asserting that educators with less content also need to be educated and content workshops should be done continuously in order to capacitate new and those who are struggling with the content. This disparity in educators might also be attributed to the fact that other educators teach without even a formal tertiary education while others without even majoring in the subjects; because there was no educator for a particular subject available, anyone is just appointed by the SMT to teach a subject. Ingersoll (1999) also states that few educational challenges have received more attention than the failure to ensure that classrooms are staffed with qualified educators, and the shortfall of educators is forcing many schools to fill openings by lowering standards. The issue of inadequate content knowledge is said by Ingersoll (2004) to be a primary factor

in the unequal educational and occupational outcomes of learners, particularly from rural communities.

However, Participant S2B, reflected on how conveniently the content was structured between Agricultural Sciences and Life Sciences subjects, and how APT allowed concurrent teaching of reproduction and genetics between the two subjects in Grade 12. Participant S2B expressed a sense of satisfaction by specifying that, "*if I don't finish off during an Agricultural Sciences period I don't panic because I know during my life sciences period I will be teaching them the same thing, and this is an advantage of teaching both subjects in one grade*". Moreover, all participants shared the same view about practical experiments (pragmatic reflections), in that the only practical wisdom for learners was to relate some of what they were taught in class to what they observed daily, in terms of animal and plant behaviours. Insufficient text books are unfortunately the main source of information to learners. Participant S1 said: "*We used to have a school garden (with my learners) and we would grow vegetables and sell to locals during harvesting, but the exercise was overwhelming and time consuming since we mainly [only] had time after school hours*". S1 also indicated that they (with learners) would also go during Agricultural Sciences periods, but sometimes due to complex scientific nature of other practices found in textbooks, it was difficult to really put other processes into practice. Furthermore, S1 said: "*some did not show much interest in agriculture because some educators also used ploughing and uprooting weed/grass as means of punishment to those who broke some school rules*. Waithera (2013) also reported that punishing learners with agricultural activities contributes negatively to the interests of learners in studying Agricultural Sciences.

Waithera (2013) further indicates that agriculture taught in only a theoretical way has failed to make an impression on society, and argues that school content for agricultural sciences should be organised around practical and the real problems of mankind, such as food security, pollution, population growth and climatic change. Waithera (2013) also states that this can only be done through practical education that can raise the contribution of agriculture in economic stability. Therefore, practical education in schools has to be emphasised by imparting technical skills to learners in order to make them more useful to society since Agricultural Sciences is an essential basis for increasing efficiency in the agricultural

production industry (Kabugi, 2013). This suggests that, CAPS should design agricultural sciences for educators to use instructional materials that enable learners to learn while doing.

The reflections above suggest that, CAPS should allocate more time for agricultural sciences content to be well delivered and understood by learners. CAPS indeed does not specify anything relating to extra hours for educators and for practical content. The hierarchy of topics to be covered in CAPS are rooted vertically on Ralph Tyler's technical, product, or instrumental approach to curriculum development, which primarily does not recognise local knowledge/context. However, there are topics such as animal husbandly and production, crop production, indigenous knowledge, organic and subsistence farming, and agricultural free marketing, which do relate to local day-to-day practices that recognise naturalism without scientism that could also be included. The fact that CAPS is more of a political document that is ingrained with international standards; it fails to embrace the lifestyle of citizens, particularly in rural areas whose farming principles are primarily based on indigenous/traditional knowledge. Therefore, because CAPS is a performance and vertical curriculum, more research needs to be done for decolonisation of indigenous knowledge and transformation of curriculum. This assertion is advocated by Lawrence Stenhouse and Paulo Freire in a book by Hoadley and Jansen (2013). Tyler (1959) has a different opinion and asserts that, content to be taught should be based on research about what is important and objectives must be clearly defined. This is exactly how CAPS is developed, but in contrary Stenhouse (1975) regards such content too idealistic, as it limits and restricts educators from incorporating what they deem as important for the local context and thus "*curriculum developers don't treat teachers as professionals*" (Hoadley & Jansen, 2013, p. 58).

4.2.5 Theme 5: Teaching environment and accessibility
- ***Where and how is teaching Agricultural sciences accessible?***

Phase 1

The environment in which teaching and learning takes place influences how accessible teaching is, both for educators and learners (Khoza, 2012). All participants reflected on the rurality and poor socio-economic status (pragmatic reflection) of the location in which they are teaching. They all used the term 'deep rural' to describe how rural their schools are

situated and as a result S1 stated, "*I teach in one of the deep rural areas of KwaZulu-Natal where the road system is bad and my school has no running water. Majority of classes have no electricity, no doors, no windows and classrooms are leaking during rainy weathers*". S2A added, "*...service delivery is very slow and even the Ministers don't visit this side of KZN to motivate and give hope to learners*". However, S2B also reflected on financial issues by saying "*I use my own car to reach school and the local government provided a free bus service to transport those who stay far to-and-from schools*". This reveals that, even though there is a scant motion of services, the government does prioritise access to education, particularly for those who cannot afford daily public transportation fees to and from schools. S2B further indicated that "*…however the bus cannot reach every village, as a result some learners have to walk to reach the main road to catch the bus, and this makes it difficult for them to reach school during bad weather conditions*". None of the participants reflected on cultural access and on whether they use online, face-to-face, or blended methods (psyche reflection) to teach agricultural sciences.

Furthermore, participant S3 raised an issue of difficulty to access school during the evening due to safety at night and proximity to schools. "*Parents do not want their children to come to school in the evening and some, also during weekends because of crime rate and house chores, respectively*". The above reflections reveal that environment and accessibility affect both learners and educators, primarily with regards to physical and financial factors. During the second phase, my participants reflected on teaching-learning contact/ face-to-face (psyche reflections), physical and financial access (pragmatic reflection) and culture (performance reflection).

Phase 2

Teaching-learning contact: psyche reflections

Participant S1, S2A and S2B had similar reflections such that S1 said: "*The only mode of contact with my learners is through face-to-face, I am teaching ± 50 learners per class. Using online environment such as Skype, E-mails, and Blackboard [software] is impossible due to unavailability of internet connection*". S2B added, "*even if there was a connection, maybe from a local library or internet café, financial barrier was going to be another issue to*

access such facilities". Participant S3 had a positive reflection on the use of online environment, a WhatsApp messaging application; "*We opened a WhatsApp group with my learners in order for us to keep each other updated about scheduling extra lessons, challenging topics cover and also sharing information*". During a focus group discussion, this was criticised by other participants saying that learners cannot have an educator's cell-phone number and it was unprofessional to text messages with learners. As part of the discussion, I intervened by addressing the issue of work ethics and professionalism regarding exchanging personal numbers with learners. Participant S3 clearly indicated that, "*…before we created the group we first addressed all pros and cons, together with how the group has to be managed. I also stressed emphasis on confidentiality and giving away cellphone numbers of members to other people*". Participant S1 saw the Watsapp online environment as another effective means of facilitating teaching and learning in this digital world, as the current generation of children are digital natives. However, even so, S1 said "*I will never Watsapp with learners because sometimes they will be out of order and share irrelevant and disturbing information because children will always be children and will always act childishly and absurdly*". S3 said: "*I understand your concerns but this is working for me and my children*"

The above psyche reflections clearly signify the relevance of a study by Khoza and Manik (2015) that is entitled, 'The recognition of Digital Technology Refugees amongst post graduate students in a higher education institution'. Khoza and Manik (2015) assert that there are still stereotypes on the use of online environment to facilitate teaching and learning. Furthermore, the stereotypes are mainly among elderly educators, in which even in this study Participants S1, S2A, and S2B have been in the working field for quite a number of years, and S3 has had only two years teaching experience. This authenticates that S3 is a 'digital native' while the other participants are 'digital refugees', according to Khoza and Manik (2015). However, all the participants agreed that the main teaching and learning environment to interact with learners was face-to-face and in classrooms. Other than the Watsapp application environment used by participant S3, online or blended environment in remote areas are not accessible.

***Physical and financial access:* pragmatic reflections**

Participant S1 and **S2B** both indicated that they use their personal vehicles to reach school and spend about R1000 monthly for fuel. Participant S1 also said, "*I sometimes use more money when I have to go and attend workshop and, 'Imbizos' (cluster schools results analysis discussions) and cluster meetings. We indicate in the register [and can] only claim towards the end each year to get our repayments*". S2B and S2A who are in the same school (S2) sometimes don't even get paid, and as a result if their school principal does not give them money, they do not attend any meeting outside their school, unless proceedings are organised in local venues like a town hall or neighbouring schools. Both S1 and S2B complained about the bad condition of gravel roads and potholes on the town's tarred roads. S1 said; "*I sometimes wish I can just walk to school because this road damages my car, but I do not have a choice not to drive my car*". S2A said "*I am renting a flat and hike to school, but sometimes I walk since it is not very much far to reach the school and I use [about] R400 a month. However, I spend too much money when I visit home during most weekends because my house is in Richards Bay*". This suggests that, accessibility does not only imply reaching the school on a daily basis, but also travelling to and from home over the weekends as some educators are not from local areas but from faraway towns. Thus, participant S3 said, "*I don't use much money to reach my school because it is within walking distance from my cottage to school, but going home during weekends and emergencies is a challenge because I am from the Eastern Cape, so I only visit my family during school holidays*".

"*I cannot stay in school cottages because they are not safe and their living conditions are bad. My colleagues always lose their belongings because burglary, mainly during school holidays and weekends when there are no occupants*", said S2A. This suggests that, crime in an area is also a challenging factor with regards to accessibility of teaching-learning. This assertion also includes unsafe conditions during evening lessons, as sometimes there are cases of robbery and rape. During a focus group discussion, participants raised some issues on inclusivity (inclusive education), created by the national Department of Basic Education, through provision of the nutrition programme for all learners, and elimination of fees in schools. For instance, S3 reflected by saying that, "*the notion of free education and food for all improved living, teaching and learning conditions in schools and as well as motivating children to come to school. I am in high spirits that even though there are challenges in*

accessing education, the government has a lot of good things we sometimes do not recognise and acknowledge". This notion has also been adopted in Botswana by a scheme known as Remote Area Development Programme (RADP) "advised the country to abolish school fees, [and] introduce a daily school feeding programme…"(Pansiri, 2008, p. 447).

Additionally, all the participants indicated that there were high volumes of learners per class, and the shortages of educators in their schools resulted in high duty loads coupled by difficulty in controlling discipline. Also, the isolation of their schools made it difficult to even access commercial farms in order to take learners to learn different techniques used in the industry, and also see what they are taught in class, done practically.

Culture: **Performance reflections**

Participant S1 and S2B indicated that they were aware of the cultural dynamics of the Ingwavuma area since they were born and grew up in the area. For instance, participant S1 said, "*I grew up here and I schooled in this school during my childhood days with most of the learners' parents and as a result if there are family cultural rituals that enforce learners to be out of school, special treatment is given to such learners because some rituals are understandable. Treatment such as given special time to write tests (if missed), extension of submissions dates, and absenteeism is communicated prior*". The two participants did not seem to see any problem in absenteeism because of culture. S2B said, "*the school is located on a land that belongs to chiefdom and therefore we need to respect local traditions and customs without having any query or reservations*". During the focus group discussion S1 and S2B said, "*we grew up like that and we can never question chiefdom about 'Umhlanga' and other cultural activities. It is our culture and we cannot compromise anything*".

Participant S3 said, "*to me, it is not very much about culture but language difference is a huge challenge because code switching sometimes confuses learners more since in my language (isiXhosa) some terms can have a totally different meaning [than] in isiZulu, as a result some learners would complain also about my accent claiming that they cannot hear or understand me*". Furthermore, S3 also mentioned that, "*when I first got here, one*

disrespectful and cheeky learner in one of my classes refused to keep quiet when I told her that she was disturbing the class and said, 'you cannot come from the your place and tell me to keep quiet in my motherland'". However, S3 indicated that there was no cultural intolerance experienced from colleagues and the society (village) at large, instead much respect and admiration is shows in the working and living environment.

Moreover, during the focus group discussion the issue of girls being absent from schools and not focusing on school activities during 'Umhlanga' time where young girls go for virginity testing, heated up the discussion, with some participants indicating that they could not call learners for weekend classes, nor make them write a test on a Monday or Tuesday after the weekend of 'Umhlanga'. So, culture does affect teaching and learning of agricultural sciences. Performance does not only involve professional or academic development, so does culture not only imply micro-ideology (local traditions) but also the socio-economic stance of a group of people. I associated performance reflections with culture as an archetype of teaching environment and accessibility because of an assertion by Pachler et al. (2008, p. 437) that, "Ideologies of education and teaching are complex and layered, and they contain macro-social, institution as well as micro-ideological levels".

The above reflections of teaching environment and accessibility make it clear that it is difficult to teach Agricultural Sciences CAPS if educators and learners stay far from schools. The DoBE does not provide transport for educators who stay far from schools. Even the bus services for learners, is not the DoBE's initiative but rather one conducted by the local government. This suggests that educators from remote schools felts subjugated by the DoBE because there is no provision for them to easily access their schools, even though office officials are aware of the conditions in deep rural areas. Furthermore, the rurality or remoteness of a school confined educators from accessing materials, even from other schools, that would benefit them during the teaching processes (Motala, 2001). The discrepancy between the existing normative framework of society and its reality is described by Spreen and Vally (2006) as a ruling ideology [that is often in the form of rights] disguises reality, diffuses perceptions and creates illusion. Felice (1996) concurs with Spreen and Vally, and adds by indicating that despite the micro-ideology's pretentiousness in appropriately promoting democracy, neo-liberalism as a functioning ideology is completely inconsistent

with the protection of human rights. This suggests that, cultural activities that will involve school girls should be organised to take place during school holidays, to avoid violating children's right to education at all time. Thus, some educators are even reluctant to go and work in deep rural areas (Education, 2010) where there are still stereotypes and local culture and beliefs mean everything to locals more than reality and authentic human rights.

Furthermore, the nature of teaching environment and accessibility may have a negative impact on teaching Agricultural Sciences CAPS because of little recognition of local or micro-ideology by CAPS. CAPS as a performance curriculum is primarily a curriculum that only commend teaching-learning to take place collectively within a demarcated site such as a classroom environment and laboratory, whereas in the competence curriculum teaching-learning can occur in any place where knowledge can be shared or transferred (Bernstein, 1975, 1999). This suggests that irrespective of environmental and cultural differences, and the curriculum approach adopted, educators should be able to implement CAPS.

Moreover, the Department of Basic Education has unlocked children from the chains of poverty and inequality by providing food programme in all government schools, free stationary, and eliminated school fees. The provision of access to free quality education to the poor is the most effective way of making schools accessible and improving literacy and numeracy levels in our societies, particularly in rural areas (Spreen & Vally, 2006). However, from the reflections, it is evident that educators should also be catered for with regards to transport to and from schools. The fact that professionalism is infused with micro-ideological, pragmatic beliefs as well as macro-ideological social and political views (Pachler et al., 2008), it was noted from the findings that the culture of using English as a medium of instructions hasn't yet settled with learners, and surprisingly with some educators. As a result some learners struggle to even construct one meaningful sentence in English, yet Agricultural Sciences CAPS is taught and examined in English. This suggests that, English as a language is a challenge on its own, and for learners to understand and pass agricultural sciences, they have to first understand and pass the language. Thus, educators indicated that they were code switching and code mixing to explain some concepts, and as result some ended up teaching agricultural sciences mainly in isiZulu, than in English claiming that it is sometimes fruitless to continue with English alone while learners are being left behind, not understanding what

you are teaching. The educators indicated that learners are resistant to learn to master English.

4.2.6 Theme 6: Educator Role
- *How do you facilitate the teaching of agricultural sciences?*

Phase 1

"I can say I do 90% of the theory because of the shortage of facilities…I write notes on the chalkboard whilst learners copy then after I explain them", said participant S1. S2A said *"after teaching I give learners class work and homework activities, and then I give them a test to write every month"*. S2B indicated roles outside the classrooms by saying, *"I teach in classrooms and also involved in cultural dance lessons in which we sometimes go and compete with other schools, I am also involved in late comers patrol and discipline those who do not come on time"*. S2B's reflection clearly outlined that an educator's role does not start and end in classrooms since learners also have other physical abilities or skills that need to be exposed and nurtured. S3 said, *"it is my primary responsibility to teach and assess my learners' academic and cognitive level in order to pass examinations. I have to organise previous question papers, make copies, and give learners some activities to do. I punish them if they do not do the work because if you don't use force, they will never do your work. Educators need to enforce learning in these learners because they are lazy and want to be spoon fed"*.

The reflections above gave a sense that those educators mainly adopted teacher-centred approach as instructors (psyche reflections) and content-centred approach as assessors of learning (performance reflections). The educators were not vocal on their role as facilitators (pragmatic reflections) by adopting learner-centred approach. Thus, educators needed to reflect critically on the three main functioning archetypes during phase two in order to see if they were consciously transformed and vividly understood their roles.

Phase 2

Educator's role as an instructor (Teacher-centred approach): Psyche reflections

All the participants mentioned that they mostly create chalkboard summaries and explain them to the learners whilst instructing them to jot down notes in their exercise books. For instance, Participant S1 said, "*Because of a shortage of textbooks, I have to instruct them to write down notes in order for them to use when revising for tests and exams. I enforce them because some will not write if I am being polite and when they fail I have to account for that failure. I sometimes randomly check their notes with dates and punish those who do not write notes*". The issue of giving instructions and punishment was also emphasised by participant S3, "*at times, learners do not want to participate in group and class discussions to make lessons learner-centred and promote active teaching and learning environment, so I hit them even though I know it is illegal because you will spend the lesson trying to calm the class you become too polite to these children*". With regards to discipline, participant S2A sprightly remarked "discipline is not negotiable".

Furthermore, participant S3 also indicated that "*during soil science and plant studies, I instruct my learners to come with soil samples such as clay, sandy soil, loam soil and others to bring water bottles in order to demonstrate soil water holding capacity and drainage rate practically. The plants will be for demonstrating different components of plants and flowers and to explain how pollen is transferred from one flower to the next during cross and self-pollination*". A remarkable note from the participants during a focus group discussion was that, even if lessons should be learner-centred (as most literature recommend) teacher-centred approach should be employed during teaching-learning. However, educators should always take curriculum aims and objectives into consideration in order to conduct the lessons smoothly. Participants also added that, setting goals (aims, objectives and expected learning outcomes) calms the learners and also allows them not to feel like they are empty vessels. This is in accordance with an assertion by Khoza (2015a) that, educators use teacher-centred approach if they use aims and objectives to propel their lessons.

 Jansen (1999) assets that, instructing learners without aims and objectives will result in a noisy classroom curriculum. Hoadley (2007) concurs with Jansen and further indicates that teaching must be rooted in educational purpose and with precise learning outcomes in order

for educators to be clear on how they will assess learning and evaluate their teaching. This suggests that the issues raised by Hoadley (2007) and Jansen (1999) were part of the reasons that OBE was revised. In addition, OBE was a horizontal curriculum without specific content [to be covered] and uniform learning outcomes because learners were viewed as having different abilities and therefore would have different outcomes. This led to the introduction of a vertical curriculum, CAPS, that specifies clear content and specific outcomes expected from learners, regardless of their diversity. CAPS is viewed as a performance curriculum that is rooted in aims and objectives (Hoadley & Jansen, 2013; Motshekga, 2011).

Furthermore, the participants demonstrated consciousness about the significance of setting aims and objectives when instructing learners and also understood that CAPS has put much emphasis on goals. With regards to behaviour, Ralf Tyler is described in a book entitled 'CURRICULUM: Organising knowledge for the classroom' (Hoadley & Jansen, 2013) as a father of the objective approach to curriculum planning, and indicates that objectives are crucial since they also describe the kind of behaviour that the learners are expected to acquire. This suggests that CAPS is an objective curriculum, even though it encourages educators to be facilitators of learning.

"*In preparation for learner-centred teaching, I select and instruct the top achieving learners to prepare some lessons and present to others*", S2B said. This psych reflection by S2B indicates that, some educators do employ learner-centred approach as an effective approach to facilitate teaching and learning while also encouraging critical thinking and problem solving skills in learners.

Educator's role as a facilitator (Learner-centred approach): Pragmatic reflections

Hoadley (2012) indicates that, learners are not empty vessels and their abilities to speak actively and transfer knowledge amongst themselves should also be encouraged by educators. Therefore, educators should not be seen as the only donors of information/knowledge, and learners only the recipients of that information/knowledge. Thus, participant S2B recognised the significance of peer teaching. S1 concurred with S2B by saying, "*learners also sit in*

groups and discuss different topics, with high flyers in separate groups to avoid dominance, and then each group would have a presenter or presenters but questions from other groups will be posed to the whole group that is presenting. My role then would be just a facilitator and overseer if all groups are working". Participant S3 also agreed to this but raised a concern of time and poor participation of other members, especially when groups are too large. During a focus group Participant S1 and S2B indicated that, "*as educators, we sometimes need to give learners, not only topics that have already been covered but new topics so that learners can teach others*". It was also stated that educators have to discuss the topic with a particular group so that they (group members) become confident and informed when presenting the lesson/s.

The notion of allowing learners to become active in classrooms is also stated in the Agricultural Sciences CAPS document that a classroom environment should allow active and critical learning by encouraging maximum learner participation rather than route and uncritical learning of given truths. Kabugi (2013) asserts that active and practical learning helps learners to learn by seeing and doing to solve their problems with confidence.

Educator's role as an assessor (Content-centred approach): Performance reflections

Sometimes, failure of the curriculum occurs not because of policies and a lack of resources as most educators would argue, but because of a lack of professionalism on the part of educators (Mchunu & Msibi, 2013)**.** Thus S3 reflected that, "*the most fundamental trait of a professional educator is his/her ability to assess learners*" S2A concur with S3 by asserting that, "*an educator as an assessor must be able to give feed back to learners*". These reflections suggest that, it is not only imperative to assess, but feedback should be given in order for learners to rectify their mistakes and improve how they do things. Carl (2012) indicates that a good assessor is one who is informed about the subject matter and able to use different strategies to empower those who are assessed.

"*Before I teach photosynthesis, I ask learners to come with plants so that I cover some (plants) in order to restrict sunlight to penetrate through to the leaves while I expose some,*

and then after this chapter I then ask them (learners) to explain the differences they observe on the plants, based on the information they have learned in class", said Participant S2B. Participant S1 further indicated that, "*when I show them videos I got from my subject advisor, I then ask them to write a report on what they saw and this is a way of assessing their listening and writing skills*". These reflections suggest that, educators should not only assess content during tests, class work, or examinations. They should also assess learners' personal skills and capabilities. Moreover, those learners who need special attention should be identified, by educators, and given special treatment while also not ignoring those who are fast learners (Stiggins et al., 2007). Therefore, this means an educator that does not assess is their learners, an educator without vision.

However, there is still a question of creating a balance between educators' roles and their professional conduct together with personal and work ethics (Veronesi & Varrella, 1999; Webb, 2009). Educators' roles do not only end inside classrooms, they go a long way as far as being role models and learners because an educator learns new things every day, about curriculum, about the children they teach, and about being the transformers of pedagogy (Freire, 2005).

The finding from these reflections indicate that, educators were aware of their roles inside and outside classrooms, even though during the first phase of reflections, they were not well informed about critical aspects of how they should facilitate teaching and learning. CAPS does allow educators to fulfil their roles: as instructors, by giving instructions on what should be done and what should not be done by learners; as facilitators, by allowing learners to dominate during discussions or debates while the educator controls and supervise the motion of the lesson; and as assessors, by evaluating learners' progress and giving feedback for improvement, and for grading purposes. Moreover, educators' reflections further revealed that educators were employing instrumental, pragmatic, and artistic approaches in their classrooms, in which before the study and during the first phase they were not aware or conscious about the approaches they were employing all along in their teaching practices.

Thus, in as much as CAPS is silent about these roles, educators were using methods they deem important and feasible (pragmatic and artistic approaches) for smooth implementation of lessons and attainment of the intended learning outcomes.

4.2.7 Theme 7: Teaching and learning resources
- ***What resources are you using to teach Agricultural Sciences?***

Phase 1

During the first phase of reflections, educators reflected only on hardware resources (pragmatic reflections), such as textbooks, desks, dusters and computers, laboratory kits and on software resources (performance reflections) such as data projectors and internet. None of the participants reflected on the ideological-ware (psyche reflections) such as teaching approaches, principles or personal pedagogic philosophies as fundamental resources in pedagogy. They all talked about sharing of textbooks due to shortages, with some indicating that desks are insufficient due to the high number of class enrolment. For Instance, participant S1 indicated that, *"learners do not only share textbooks but also share desks that are meant for only one person"*. However, S3 indicated that *"there are few learners who are doing Agricultural Sciences and so desks or seating benches are not a problem in Agricultural Sciences classes"*.

The fact that all the participants were not vocal on their individual or personal approaches and philosophies during phase 1 revealed that they were not aware that pedagogic ideologies are also a resource, even though they are not tangible and visible. I gave them a few articles to read in order to understand the functioning words of resources (hardware, software and ideological-ware resources) (Khoza, 2015a, 2015b, 2015c, 2015d).

Phase 2

Ideological-ware resource: Performance reflections

Participant S3 agreed with participant S1 that, *"I mostly use teacher-centred approach primarily because of time constraints, but I also use learner-centred approach"*, and S2B came with another perspective that, *"I sometimes use in <u>loco parentis</u> as learner sometimes*

need to be motivated about life and not only for academic progression". S2B further indicated that, such an attitude also enhances the subconscious mind of a child so that they can feel motivated to come to class. In addition, a child is able to a role model to look up to. This makes learners enjoy one's lesson and may yield better results. During a focus group discussion all the participants agreed with S2B, as S1 said, "*this approach also sets a positive teaching-learning environment and strengthens the teacher-learner relations*". S3 also said "*my lessons and assessment strategies are always rooted on learning outcomes and in accordance with Bloom's taxonomy*". The performance reflections revealed that they indeed educators transformed their way of thinking and recognised their approaches of teaching as part of day-to-day fundamental resources

The issue of ideology in education is viewed by Freire (2005) and Jansen (1999) as an imperative aspect and resource to facilitate and create a conducive teaching-learning environment. Hoadley (2012) also asserts that personal ideology and attitudes drive all other resources used in class, and thus Khoza (2012) indicates that any approach or object that communicates teaching is a teaching resource. This means that educators including their ideologies are a resource, and this is also in line with Fullan (1993) who states that the life and death of the curriculum is at the hands of educators as they are the agents of change. This suggests that educators use different ideologies to teach Agricultural Sciences CAPS, even though CAPS has a specific hierarchy of lesson topics. CAPS does not specify how each topic should be taught, thus educators have to incorporate their artistry (artistic approach) to teach and attain the intended curriculum.

Hardware resources: Pragmatic reflections

Participant S1, S2A and S2B agreed with a reflection made by S3 that "a chalk board, notebooks, textbooks and precious question papers are the main resources used to teach and assess learners". Participant S2A added "*the department issues a hard copy of an Annual Teaching Plan, lesson plan template and programme of assessment template*". During a focus group discussion, the participants also identified CAPS document as one resource that is important but hardy read; as S1 said, "*I never read the CAPS document from cover to cover in order to understand every aspect of Agricultural Sciences Curriculum*", This suggests that

some Agricultural Sciences CAPS educators do not really know what is entailed inside a CAPS document even though it is a guide to their practices of Agricultural Sciences. The further discussions also raised concerns about a shortage of seating [benches] for the learners, and the participants, also indicated that the schools regularly ran out of chalks for the chalkboard.

Software resources: Psyche reflections

Participant S1 indicated that, "*there are computers in my school but they are not used because the school principal is claiming that it is going to be expensive to fix them, and as a result the computer room is not used. However, I sometimes use a school projector to show learner videos and pictures as part of my teaching*". This implies that learners are denied the opportunity to use computer programmes (software resource) in the school because of limited financial resources. "*I use internet to download pervious question papers and memoranda using my smart phone, and I also have videos and PowerPoint slides that our subject advisor gave us*", said S3. S2B explained "*I cannot download documents because technology is a challenge to me and this requires data bundles and the school does not provide for that*". Furthermore, during focus group discussion (Phase Two), the issue of time to install the devices (hardware) and access the programmes (software) was a challenge because before you gather the learners you need to first check if computers and projector are functioning properly. This resulted in very limited use of these resources, particularly in schools S1 and S2.

The above performance reflections clearly indicate that, not all educators have access or skills to operate software resources. This means that some educators cannot access while others cannot use, the modern technology either for work purposes, or social networks. Furthermore, during the focus group discussion, the participants suggested that time should also be included as one of the functioning archetypes of resources, and not be separated as an independent archetype. They (participants) also suggested that school gardens and the technical skills to work on school gardens become a vital resource and skill development process in agricultural science learning. Indeed, this is evidently showing that the participants were transformed by this study and their teaching practices were improved because they

managed to have significant input that, time should me made a fourth functioning archetype of resources. Moreover, their ability to reflection on the three functioning words of resources is also evidence that this study has brought transformation in how they view teaching and learning resources.

Ndwandwe and Dlamini (2013) believe that the lack of natural resources such as agricultural land (gardens) affects knowledge transference and leads, in essence, to the fundamental nature of agriculture being ignored. CAPS does to the issue of having gardens in each and every school offering agricultural sciences. CAPS only focuses on resources used to transfer theoretical knowledge and ignores the practical know-how component of learning. Moreover, because CAPS is rooted on scientific research, the local context is not significantly recognised as it should be. Even though, CAPS is an instrumental curriculum, sometimes it is difficult to meet the policy's aims and objectives with the school's limited resources, particularly in remote areas. Therefore, teaching is a function of selecting curricular archetypes, understanding, and implementing the Nano-curriculum with learning resource (Khoza, 2015d). Teaching ideologies are not an exception to this assertion by Khoza, and educators can choose their own approach or strategy to employ in their own classrooms (Kehdinga, 2014a).

Furthermore, all the above reflections from both phases (Phase 1 and 2) show that educators teaching CAPS may choose to employ the instrumental/objective/product approach by Tyler (1959); process approach by Stenhouse (1975); pragmatic/critical approach by Freire (1985); and artistic approach by Eisner (1979).

4.3 Conclusion
This chapter presented the reflections (findings) from Agricultural Sciences CAPS educators. The findings (data) were analysed and discussed according to themes and categories that were entrenched on curricular archetypes. Functioning archetypes (words) for all the themes were entrenched on three prepositions of reflections; psyche, pragmatic, and performance reflections. Findings from this study showed a positive correlation between all the themes and how each theme stabilises the other and the curriculum practices. The findings from this

study revealed that due to insufficient resources, time and occasionally the environment, including policies that are not well conducive to implement the intended curriculum, there is a gap between intended, implemented, and attained curriculum. It is also evident from the findings that reflections on practicing Agricultural Sciences Curriculum reflect instrumental/ vertical/collection curriculum as opposed to pragmatic/horizontal/integrated/competence curriculum. The summary of the study, the conclusions and the recommendations will be presented in Chapter Five.

CHAPTER 5

Summary, conclusions and recommendations

5.1 Introduction

The mail aim of this study was to explore educators' reflections on their practices of agricultural sciences Curriculum and Assessment Policy Statement.

The specific research questions were as follows:

- What are educators' reflections on their implementation processes of the current South African Agricultural Sciences Curriculum (CAPS)?
- What informs educators' reflection to be the way they are about executing their duties?
- What lessons can be learnt with educators' reflection in implementing Agricultural Sciences (CAPS)

This section of the research will revisit the research questions mentioned above, summarize the research findings and offer conclusions based on the research findings, data analysis and discussions presented in the previous chapter. Recommendations for future research will also be presented. The conclusions will give direction of the reflections whether they were influenced by psyche, pragmatic and/or professional rationale. They (conclusions) will also be entrenched on the themes emerging from the data discussed in the previous chapter. Reasons for the direction/s will also be indicated. Thus, this chapter will also show how the above-mentioned research questions are addressed by the findings.

5.2 Summary of chapters

The researcher introduced the study in Chapter 1 and outlined the aim/focus of the study, delimitation, literature review and objectives. The rationale of this study indicated the researcher's personal reasons for embarking on this study, as well as societal and professional reasons. The research questions which helped to demarcate the research problem were also stated in Chapter 1.

Chapter 2 provided literature of what have been studied relating to the study. The literature studied revealed that there has been a lot of worldwide controversy with regards to

curriculum development and implementation. Chapter 2 reviewed literature on educators' reflections, curriculum enactment, curriculum implementation, curriculum development approaches (instrumental approach, communicative approach, artistic approach and pragmatic approach) and curricular archetypes. The chapter also revealed psyche, pragmatic, and professional reasons as the three functioning archetypes of educators' reflections. A fruit tree model was used to link the ten curricular archetypes (the rationale, goals, teaching-learning activities, content, educator role, resources, accessibility, environment, time, and assessment) that equally play an integral role in how the curriculum is put in place and how they underpin educators' practices. It has also been revealed that, in South Africa, there have been several curriculum review processes since democracy; from the Christian National Education of the apartheid regime until the Curriculum and Assessment Policy Statement (CAPS), of the current curriculum. Literature also revealed that the curriculum review processes were a result of asymmetrical recognition of the curricular archetypes which disconnects intended, enacted/implemented and attained curriculum. If the archetypes are not equally recognised by curriculum developers and users (implementers), then there may be a collapse in curriculum at all levels, from MACRO to NANO level (Berkvens et al., 2014).

The third chapter dealt with the research design and methodology which included research paradigm (critical paradigm), research approach/style (action research), sampling (convenience and purposive), data generation reflective activity, one-on-one interviews and focus group discussion, data analysis (deductive and deductive reasoning of the guided analysis), ethical issues and limitations.

The fourth chapter presented and discussed findings from data which were generated and analysed according to themes. This was done via guided analysis following the fruit tree diagram shaped by the ten curricular archetypes. From the data generated, educators' reflections on their practices of Agricultural Sciences Curriculum and Assessment Policy Statement were explored so that they could transform their teaching practices.

5.3 Summary of findings and conclusions

Reflections form educators have revealed that psyche (personal) and pragmatic (social) reasons were the foremost factors influencing Agricultural Sciences educators' reflections on their practices. The two phases of data generation, based on the ten curricular archetypes,

explored, in-depth, the educators' reflections on the implementation processes of Agricultural Sciences CAPS, and this addressed the first research objective and research question of the study. Professional (qualification) rationale was not the main reason that influenced Agricultural Sciences educators' practices, and the findings revealed that being qualified may not always guarantee good quality results, experience also does. Educators' personal (passion) to education and societal needs, together with the ever-changing policies at national, provincial, district and school levels informed educators' reflections to be the way they are. These reasons address the second objective and research question of the study which include factors that inform educators' reflections to be the way they are about executing their duties. From educators' reflections, it was learnt that most schools, particularly in rural areas, lack support and adequate monitoring to enable effectiveness of the changes in curriculum. It has also been found that, educators' attitudes (that include complex mental states involving beliefs, feelings, values, and dispositions that act towards curriculum implementation) contribute to the negative effects and implementation of a new curriculum in many rural schools. It was also learned that most educators may not be well aware of all the factors that underpin their practices as curriculum implementers, and the curriculum developers don't seem to consider much of what educators feel at implementation stage. As a result, the government still has a responsibility to ensure that there is a strong correlation between policy makers, implementers (educators), and societal needs. The findings also revealed that, curriculum development in an on-going process that is supposed to take place in an ever changing society, and should take into account of what the society needs. These are the lessons that can be learnt from educators' reflections, as asked by the third research question.

The following conclusions are derived from the findings of the study and will be categorised into themes.

5.3.1 Theme 1: Rationale

There is no practice that can be successfully implemented and yield good quality outcomes if the 'why' question is not clearly understood and answered (Khoza, 2016). The three prepositions of rationale; personal, social and content knowledge rationale (Berkvens et al., 2014). This indicates that understanding the reasons of teaching any subject enhances effective teaching and learning. Thus, the findings indicated that there is a significant need to know why Agricultural Sciences educators are teaching. The findings of the data analysis also revealed that, what lies before you and what lies after you, are small matters compared to

what lies within you. In particular, educators positioned passion (personal rationale) as the most catalytic drive in their teaching of Agricultural Sciences. Personal rationale was also a dominant rationale, as the educators stipulated that agriculture is life and whatever is learned in school should be practiced at home and in society at large. Content rationale did not have much weight in the findings since sometimes the content is based on scientific research and does not embrace local knowledge and learners' personal talents.

Furthermore, Agricultural Sciences CAPS does not specify the rationale needed to teach the subject. This suggests that educators need to find, for themselves why they teach Agricultural Sciences, and any curriculum implemented without a rationale may have some backlogs and yield poor outcomes/performance (Khoza, 2016). Agricultural Sciences educators do not really think about the reasons of teaching during their lessons, and CAPS does not engage educators to reflect on their rationale to teaching Agricultural Sciences. However, the psyche and pragmatic nature of educators' reflections answered the first research question: What are educators' reflections on their implementation processes of Agricultural Sciences CAPS? Moreover, the passion for agriculture and enthusiasm for a significant social/societal transformation is what informs Agricultural Sciences educators' to be the way they are about their practices. This addresses the second research question. Findings from the data analysis also addressed the third research question which investigate the lessons to be learnt from educators' reflections; the main lesson found that as long as CAPS does not adequately embrace and recognise micro social transformation, educators may still continue to incorporate indigenous knowledge when teaching Agricultural Sciences, even if it is not prescribed in the policy document. This may result in a gap in the hierarchy of the prescribed intended curriculum and expected outcomes.

5.3.2 Theme 2: Goals

It came out very clear from the findings, particularly during the first phase of reflection, that educators did not know the difference between aims and objectives, even though their reflections were psyche (aims) and pragmatic (objectives) in nature. Learning outcomes came last when educators reflected on goals. Furthermore, their reflections on aims and objectives were aligned with the ones indicated in CAPS document and literature. The findings also indicate that the subject goals should be aligned with rationale, where learners should possess skills and knowledge to be competitive in school, job-market and in society since the goal is

to inculcate intellectualism, socio-political consciousness, and problem-solving skills. The findings further indicated that there should be precise and specific aims and objectives which are aligned to the expected learning outcomes. From the reflections it was learnt that educators need to be empowered and transformed, like the ones who participated in the study, in order to eradicate curriculum backlog by bridging intended, implemented and attained curriculum.

Furthermore, CAPS does not link the aims with the intended learning outcomes specifically for Agricultural Sciences. Instead, CAPS specifies general aims which do no link directly with each grade. For instance, the Agricultural Sciences CAPS document is a single document that specifies aims and objectives for agricultural sciences generally from Grades 10 to 12, yet the content taught in each grade is different, and so should the aims, objectives and learning outcomes be different as well. Thus, if subject aims and objectives are not specific, learning outcomes will not be consistent (Berkvens et al., 2014; Harden, 2002b; Khoza, 2013b). The actual skills that learners should have in order to practice agriculture in their societies are not specified, and the fact that each grade has a different syllabus, learners also learns different skills and so the learning outcomes are expected to be different. Therefore, the generalisation of goals (aims, objectives and learning outcomes) may be confusing to Agricultural Sciences educators.

5.3.3 Theme 3: Teaching and assessment activities

Findings from the study revealed that the main tool for seeing if teaching was done efficiently and effectively is through assessment, and assessment activities are aligned with teaching activities because the nature of activities determine how they will be assessed. This is in line with an assertion by Hoadley and Jansen (2013) that assessment is the most vital component of teaching. Agricultural Sciences educators also concur with this by indicating that they mainly administer informal formative activities (psyche reflections) such as a minimum of two homework and two class work activities per week, but with no reservations to informal group discussions or debates to evaluate learners' progress. The findings also indicated that educators reflected on interval activities (pragmatic reflections) as they are formal activities that are used for grading purposes. These are formal/controlled tests and exams that are written every once in every term for report purposes. This suggests that educators reflected

on psyche and pragmatic levels of reflection, but their teaching practices were transformed by the action research and this was evident when they reflected also on the uninterrupted continuous assessment activities (CASS).

Furthermore, from the findings, CAPS enlightens educators of the types and quality of formal and continuous teaching and assessment activities by also issuing a programme of assessment and assessment guidelines according to Bloom's taxonomy. However, the findings indicate that CAPS does not specify the formative teaching and assessment activities (informal activities) that should be given to learners. This suggests that educators need to be artistic and pragmatic in deciding what they see as significant when giving learners formative activities. However, the findings indicated that for Grade 12, unlike in Grade 10 and 11, formal controlled tests and examinations for Agricultural Sciences are common for all learners since they are set provincially, but the formal tasks (assignment, project, practical and investigation) are set at a cluster level and all contribute to continuous CASS.

Moreover, each school has its own needs for resources, and the differences in availability of resources in different schools make educators from different schools employ different teaching activities, based on the available teaching resources. These cause educators to use different teaching methods (and have different experiences), yet all of their learners from all schools will be assessed the same, regardless of the feasibility of the teaching during the teaching process. This practice may yield attained curriculum that is different from the CAPS intended curriculum. Table 5.3 and 5.4 below show the Agricultural Sciences programme of assessment and codes with their percentages for recording and reporting that are used by educators, respectively.

Programme of Assessment							
Assessment task							
CASS						End-of-year Assessment	
Percentage allocated	25%						75%	
Forms of assessment	Practical investigation	Research project	Assignment	Controlled tests	Mid-year examinations	November examinations	
Number of pieces	1	1	1	2	1	1 (paper 1+2)	
Marks	20	20	20	10	10	20	150	150
Sub totals	100					300	
Grand Total	400						

Table 5.1: Agricultural Sciences Programme of Assessment

Rating codes	Description of competence	percentage
7	Outstanding Achievement	80 - 100
6	Meritorious Achievement	70 - 79
5	Substantial Achievement	60 - 69
4	Adequate Achievement	50 - 59
3	Moderate Achievement	40 - 49
2	Elementary Achievement	30 - 39
1	Not Achieved	0 - 29

5.2: Codes and Percentages for recording and Reporting

5.3.4 Theme 4: Content and time

The literature indicates that there should be a strong link between the content to be covered and the time allocated to cover that content. It is also outlined that if time is limited, then curriculum backlog will increase. The findings indicate that there is no balance between

156

theory and practical skills learned in schools. Agricultural Sciences is a practical subject but the findings outline that there is no time allocated specifically for practical work, yet agricultural skills need to be practiced than memorised in order to pass exams. The findings also outline that CAPS prescribes all the topics to be covered, and specific time frames [to cover them]. This means that educators should be well knowledgeable about the subject content (topics) so that they are able to explain to learners, while also considering time allocated for each topic. Therefore, educators' reflections on content and time were mainly influenced by topics and time to cover those topics (psyche reflections) and subject knowledge, skills and qualifications (performance reflection).

The findings further indicate that the annual teaching plan ensured Agricultural Sciences educators strictly adhere to the prescribed topics as CAPS allocates no time for external and/or indigenous/local knowledge to be incorporated in schools during teaching and learning. Thus, the over-scientism nature of CAPS may disconnect pupils from micro ideological reality. This explains as assertion by Czerniewincz and Brown (2014) that learners find it difficult to be assisted by their parents and siblings (on school work) at home, particularly in rural areas where most parents never obtained formal school education, and their intellectualism is rooted on indigenous knowledge that makes them organic intellectuals. The sequential manner in which Agricultural Sciences topics are organised by CAPS prepares learners primarily for future education in the international world (Berkvens et al., 2014). This suggests that traditional/indigenous/local content has no place in formal science curriculum that is based on international standards because Agricultural Sciences classrooms are dominated by western content as opposed to local content and this sometimes make the subject less relevant to the context of rural learners and less interesting to them and their communities.

Furthermore, the findings outlined that minimal to no experimental learning in rural schools is a result of limited resources and time needed to even cover the prescribed content. Educators need to sometimes use their own personal resources and time for teaching in order for learning to take place efficiently and effectively. Qualifications is also outlined, by the finding, to be one important aspect as it indicates that educators are trained, skilled and

knowledgeable about the subject and are fit to teach Agricultural Sciences. Some Agricultural Sciences educators had qualifications to teach the subject and those without qualifications had the knowledge and skills gained through the teaching experience.

5.3.5 Theme 5: Teaching environment and accessibility

There seem to be no specialised environment accessible for educators to teach Agricultural Sciences apart from classrooms, and CAPS is silent on the issue of teaching environment and accessibility of teaching the subject. Educators' reflections were primarily on physical and financial access (pragmatic reflections) and the findings had a strong emphasis of the importance of physical and financial accessibility of the teaching environment. Most learners and some educators had to walk to school during bad weather conditions which became a challenge to access school. The findings also indicated that, even though there is a free public bus that transports learners the bus times do not accommodate learners who attend supplementary classes and do not have money for supplementary transport. Moreover, educators are not provided with transport and have to find means of accessing the school before and after working hours to begin and continue with teaching and learning processes.

Furthermore, the findings revealed that the Department of Education does not offer any money for visiting farms for learners to get practical experience of what they learn in class, and CAPS is silent on addressing the practical aspect of Agricultural Sciences that could assist in yielding better results in the implementation of the intended curriculum. Professional reflections where girls' absenteeism at schools as a result cultural rituals such as virginity testing highlighted that culture does impact teaching and learning. Thus, micro ideology (cultural access) can influence the presence of girls at schools. However, religious, tribal and racial differences were reported to be a barrier in the implementation of Agricultural Sciences, even though English that is used as a medium of instruction is a barrier to many learners. It is sometimes a barrier to educators and some concepts are more easily explained in the vernacular than in English.

The findings indicated that educators transformed their practices and also their awareness of teaching environment and accessibility, as they were able to reflect on psyche, pragmatic, and performance levels of reflections.

5.3.6 Theme 6: Educator Role

Educators, according to literature, have roles to play not just inside classroom but also outside classrooms, and this makes educators' work complex and difficult. Inside classrooms they have three primary roles, namely, instructors, facilitators and assessors (Freire, 1985; Kehdinga, 2014a; Khoza, 2016; Khoza & Manik, 2015; Stenhouse, 1975). The findings also reveal that educators' other non-academic roles include school clubs, sports and social committees, school monitoring, and cleaning. These multiple roles are all expected to be played by the same educators who have to, in all odds, implement 100% of the intended curriculum. Educators' academic roles include being an instructor (teacher-centred); facilitator of learning (learner-centred); and assessor of learning (content-centred). The academic roles are the main roles, and it is not easy for educators to adequately play these roles when there are also non-academic roles. This becomes a strain to educators, makes their work difficult, and ultimately disrupts the implementation of the Agricultural Sciences.

The reflections on educator role indicated a significant transformation as the educators reflected on all the levels of reflection. The reflections also answers the third question about the lessons learned from educators' practices. Educators have got too much to do, and the findings also revealed that the monetary rewards are not equivalent with the work they are doing. CAPS only prescribes what to be taught but not how it should be taught and how it should be assessed. Thus the findings indicated that educators had to decide how and when to implement a particular role in their classrooms.

5.3.7 Theme 7: Teaching and learning resources

It is stated in the literature that the most ignored teaching resource is ideological-ware resource, and most used ones are the soft-ware and hard-ware resources (Kehdinga, 2014b; Khoza, 2016; Khoza & Manik, 2015). Most educators are only aware of soft-ware and hard-

ware resources and unaware that these resources are meaningless without ideological-ware resources.

5.4 Suggestion for further research

Research on the implementation of Agricultural Sciences, mainly in rural areas, need to be done. Research also has to be done on each curricular archetype in order to acquire an in-depth understanding of the development and implementation processes of Agricultural Sciences in South Africa and other countries. The feasibility of curriculum implementation in rural and urban schools also needs to be explored in order for curriculum developers to see and understand the difficulties of attaining the intended curriculum in schools with few resources. Educators need to be given more opportunities to reflect on their practices through research.

5.5 Recommendations

CAPS as the current curriculum that has been produced from the National Curriculum Statement also needs to be revised in order to make the implementation processes of Agricultural Sciences easier. Educators don't find themselves included in the development stage of CAPS, and thus they need to contribute in future as they are the primary implementers of the curriculum. The following recommendations are based on the conclusions made above;

5.5.1 Recommendation 1: Rationale

In order for educators to find Agricultural Sciences a enjoyable subject to teach, CAPS need to redefine the subject rationale. This will also establish a strong ground to attain clear and precise outcomes where all stakeholders are involved in the improvement of teaching and learning processes. It is recommended that educators, as the primary implementers, have to be directly involved during the strategic planning process of curriculum development and redefining of rationale because they may always reflect on the feasibility of the subject rationale.

5.5.2 Recommendation 2: Goals

First and foremost, teaching goals which include aims, objectives and outcomes must be realistic and attainable to both educators and learners. This means there must be a strong link between goals and Agricultural Sciences content. Therefore, the goals towards the teaching of Agricultural Sciences CAPS need to be reviewed to ensure that they do not create false expectations on the outcomes and put pressure on educators. The curriculum goals should also be aligned with societal needs. CAPS should also aim to explore and embrace learners' personal talents (inborn gifts) than only focusing on common academic excellence. CAPS must take into account that personal and technical agricultural skills, not only intellectual capacity, are also important skills to be embraced.

5.5.3 Recommendation 3: Teaching and Assessment activities

Teaching activities should be linked with assessment activities to ensure appropriate methods of assessment are utilised. It is also recommended that the CAPS documents should prescribe also the informal activities to maintain uniformity, standardisation and quality of informal formative/processing activities. Agricultural Sciences as a practical subject should have more technical activities than theoretical activities so that learners can also be able to practice at home what they learn in class. Learners should also be assessed based on how they prepare garden and how they maintain the intercropping rows and spaces in-between crops/plants. This means that assessment should not only be based on classroom activities, but rather more on what they do than what they read.

5.5.4 Recommendation 4: Content and Teaching time

The content taught should always be aligned with the goals and rationale for teaching Agricultural Sciences. In order for the content to be interesting, CAPS should not make it to be too scientific because other learners, who mainly from rural areas, learn Agricultural Sciences in order to get skills and be able to assist their parents to grow livestock and crops at home. Therefore, traditional farming methods should also dominate in the Agricultural Sciences syllabus in all grades. To ensure educators are well knowledgeable of the content, the Department of Basic Education should make sure that all educators teaching Agricultural Sciences have undergone proper training from various higher education institutions and possess qualifications to teach the subject. The Department of Basic Education should also

allocate time for practical and laboratory activities without compromising time for other subjects. The department should also work together with the national Department of Agriculture, Forestry and Fisheries (DAFF), Agricultural Research Council (ARC) and Department of Rural Development and Agrarian Reform (DRDAR) to organise educational excursions during weekends and holidays in order for learners to understand what is needed on the job market to be competitive in agricultural ventures. Educators teaching beyond normal school time should be paid overtime just like any other job.

5.5.5 Recommendation 5: Teaching environment and Accessibility

Most educators and learners who stay far from school find it difficult to attend school on time, especially during poor climatic conditions. Therefore, the DoBE should provide transport services which will use school times to transport educators and learners. All schools must have access to clean running water, electricity and sanitary conditions. These are basic living conditions that each and every school needs to have, just like health institutions (hospitals and clinics). There must be libraries built in central locations in order for learners to access information for homework, assignment or projects and to prepare for examinations. This may enhance the teaching and learning of Agricultural Sciences.

The department should provide free sanitary towels for schools girls on a regular basis in order for every girl-child to access school. Sanitary towels, like condoms, should be provided for free in schools. Furthermore, there should be social workers who visit schools regularly to provide counselling to learners who are affected by academic and personal challenges. The DoBE should also address the issue with traditional leaders, of girls missing school during September every year, due to the 'Umhlanga' virginity testing ceremony, so that the event can be re-organised to take place during school holidays.

It is crucial for the department to revise the PPN model in order to avoid large teacher-to-learner ratios in schools, as it is difficult to control larger numbers of learners in one classroom. It should be a strict priority that all schools and classrooms have enough benches, desks, doors, windows and roofs that are not leaking.

5.5.6 Recommendation 6: Teacher Role

It is important that educators are given opportunities to reflect on their roles as educators (Khoza, 2016). This may allow them to understand their full roles as educators and the

Department should also have workshops to bring educators into their consciousness about their roles and responsibilities inside and outside classrooms. Curriculum designers should also allow educators to be role players in the policy development stages. The administrative work such as compiling marking lists and compiling reports should be a clerk's responsibility and not the educators'. In order for educators to perform their roles effectively, there should be adequate resources, time and accessibility to all facilities that they may use. So principals should not restrict educators from accessing teaching learning facilities.

5.5.7 Recommendation 7: Resources

Most, if not all, rural schools do not have adequate textbooks for effective teaching and learning of Agricultural Sciences (Bantwini, 2010; Kabugi, 2013; Olaitan, 1988; Suleiman & Barry, 1997; Waithera, 2013). Therefore, it is recommended that the Department must provide a large enough budget for every learner to have a textbook for each subject. Technology integration at schools is escalating and educators need to be computer literate, so workshops should also train educators on how to use technology. Some schools are provided with computers and tablets for online teaching and learning, so all schools should be provided with technological devices, even if there is only one such device connected to the internet in order to make teaching and learning interesting and enjoyable to both educators and learners. It is recommended that the DoBE builds Agricultural Sciences laboratories in all schools offering the subject. This may enhance the quality of Agricultural Sciences in schools and may yield better learning outcomes, and would increase the number of learners and educators interested in the subject. CAPS should also address the issue of ideological-ware resources in schools.

5.6 Conclusion

Educators' reflections on the implementation of Agricultural Sciences Curriculum and Assessment Policy Statement were explored. The objectives were met and the research questions were answered:

- Research question 1: What are educators' reflections on the implementation of Agricultural Sciences CAPS?

Answer: Educators reflections are their (educators) psyche, pragmatic and performance perceptions of their day-to-day practices and these reflections are influenced by personal, societal and professional rationale.

- Research question 2: What enlightens educators' reflections to be the way they are about executing their duties?

Answer: Educators' daily experiences during the implementation processes together with the daily knowledge enlighten their reflections.

- Research Question 3: What lessons can be learnt with educators' reflections in the implementing of Agricultural Sciences CAPS?

Answer: Educators can always improve their teaching practices in order to yield good quality outcomes that are aligned to their teaching rationale and subject goals.

Empowering educators as the primary implementers of the intended curriculum may bridge the gap between intended, implemented and attained curriculum. This was evident when the participants in this research/study transformed during the second stage of reflection and were able to reflect critically on all archetypes that underpin their teaching practices. Furthermore, inadequate resources cause disparities between intended and implemented curriculum and this increases curriculum backlog. Agricultural Sciences is a practical subject and failure to acknowledge that yields unskilled agricultural graduates who are filled with more theory than technical/practical skills (Waithera, 2013).

My philosophy statement

I conducted this study because I needed to make a difference. Many do not perceive teaching as a valuable and attractive career yet it contributes significantly in the present and future of an individual, household, society, nation and the world at large. Thus, curriculum implementation needs to researched, and educators as the users of the policy or the implementers/enactors of the curriculum need to be frequently engaged to reflect on their practices. Hence the engagement I had with the educators immensely transformed me as an educator, as a person, as a socialist and as a conscious citizen.

Furthermore, this study has broadened my understanding of the theories that underpin my day-to-day experience and also gave me a sense of understanding why implementers of the same curriculum attain different outcomes. Being aware of the factors (theories) has allowed me to reflect regularly on my lessons and also understand that learners learn differently, so their differences need to be recognised and appreciated. Just as society has evolved over time, generations and human mind-sets have also evolved over decades into a global system of immense size and complexity. I am now able to critically think of other innovative ideas to unlock current societal challenges. So, as an educator, I now know that teaching is not only about transferring knowledge to learners but also exposing their talents while also inculcating/instilling values into the young generation in order to produce responsible and conscious citizens. Thus, personally I feel obliged to understand that each child is a unique individual who needs a secure, carrying and stimulating atmosphere in which to grow and mature emotionally, intellectually, physically and socially. It is my duty to act as a guide, allow learners' natural curiosity to direct his/her learning whilst also aiming to attain curriculum goals. My responsibility is to provide access to information rather than being the primary source of information.

Moreover, from this study I now know that despite the vertical and hierarchic nature of CAPS, I am a facilitator of learning and learners have to learn to construct their own knowledge; they need the opportunity to discover their own capabilities and practice their skills in new situations. I also believe that learners do not come to school as empty vessels, so checking their prior knowledge is vital in order for me to move from what they already know

(known) to what they do not know (unknown) during teaching and learning. Thus, all learners deserve equal opportunities to partake in classroom activities.

I believe that there is no teaching approach that is innocent or better than the other. However, integrating different approaches may allow educators to bridge their rationale/vision and goals with those of the curriculum/societal goals and needs. Despite the hostile environment under which we sometimes teach under, I am an educator and I need to educate learners. If it means using my own resources, as the rural schools are under-resourced, to keep the teaching and learning of Agricultural Sciences progressing, then I will because waiting for resources when time is moving forward is detrimental to the curriculum. This study has allowed me to equally recognise all the curricular archetypes and understand that ignoring any of the archetypes may result to curriculum failure.

I am grateful to God for giving me the experience and opportunity to discover what it means to be an educator. I am such a transformed educator and will always strive to be the best educator that I can be.

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1. Appendix A- Letter to the Department of Basic Education

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Mr. MB Nkohla

Private Bag x 2234

Magugu Area, Ingwavuma

3968

06 April 2016

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Office of the District Director (Umkhanyakude District)

CNR of Thembalethu and Telebe road

Mkhuze

KwaZulu-Natal

3965

Dear Mr TJ Motha (Umkhanyakude District director)

Re: Application for Permission to conduct research in schools at Ingwavuma Circuit of Umkhanyakude district

I am Mr Msimelelo Buyisile Nkohla, an educator and Ingwavuma High School and a candidate studying for Masters of Education in Curriculum Studies at the University of KwaZulu-Natal, Edgewood campus, Pinetown. I am conducting a study to explore **Educators' Reflection on their Practices of Agricultural Sciences Curriculum and Assessment Policy Statement (CAPS)**. I have observed that educators are not well aware of the theories that underpin their practices, and as well as issues between intended and implemented curriculum which yield different results (attained curriculum). I am conduction an action research, thus I am also involved in the research and I am teaching Agricultural Sciences. Therefore, to gather all the information (data) to successfully complete my studies, the following schools are sampled to be used for this research:

1. Ingwavuma High School
2. Isicelosethu High School
3. Ndamkane High School

I would therefore like to request to use these schools and their agricultural sciences educators to conduct this research. Please Note the following:

- The schools and educators' confidentiality is guaranteed;
- Interviews, reflective activity and focus group discussion may last for about an hour;
- Any information given by the educators cannot be used against the school, and the data generated will **ONLY** be used for the purposed of this research;
- Data will be stored in secure storage and destroyed after five years
- Educators can withdraw from the research at anytime they feel any discomfort;
- Real names of schools and educators will not be used, instead symbols such as S1, S2, and S3 will be used to represent the schools and educators
- School and educators' participation is entirely for academic purposes, and they are no financial benefits involved.

The work plan to complete this research is as follows:

Time Frame	Activities/Guidelines
01 December 2015 – 31 January 2016	Proposal development
01 February 2016 - 30 May 2016	Literature review
01 April 2016 30 May 2016	Defending Proposal and Ethical clearance application
01 June 2016 – 30 June 2016	Data generation
01 July 2016 – 31 July 2016	Data Analysis and formulation
01 August 2016 – 31 August 2016	Discussion results and chapter submission
01 September 2016 – 30 September 2016	Working on supervisor's comments and writing conclusions
01 October 2016 – 15 October 2016	Finalising dissertation and submitting first draft to supervisor
01 November 2016	Turnitin (Plagiarism check)
15 November 2016	Submit to an editor
30 November 2016	Final submission for examination

I can be contacted at:
Cell: 073 396 1698/ 083 286 6259, email: mbnkohla@gmail.com

My supervisor: Dr S.B. Khoza. Location: School of Education, Edgewood campus, University of KwaZulu-Natal. Phone: 031 260 7595, Email: khozas@ukzn.ac.za
Discipline Co-ordicator: Dr L.R. Maharajh, Curriculum Studies, School of Education, Edgewood campus, University of KwaZulu-Natal. Phone: 031 260 2470, email: maharajhlr@ukzn.ac.za

NB: May I please have a formal and official letter that permits me to conduct the study

Thank you for your contribution to this research.

Declaration

I, ……………………………………………………… (Full names of the District director) hereby confirm that I understand the contents of this document and the nature of the research, and I consent for the schools and educators to participate in the research.

I understand that the schools and educators are at liberty to withdraw from the research at any time, should they feel uncomfortable to continue with their participation.

…………………………………   ………………………..

Signature of District director   **Date**

Official Stamp

2. Appendix B - Letter to the School Principal

<div align="right">

Nkohla M.B (Mr)

Private bag x 2234

Magugu Area, Ingwavuma

3968

06 April 2016

</div>

Dear School Principal

Re: Application for permission to conduct Research at Ingwavuman High School

I am Mr Msimelelo Buyisile Nkohla, a candidate studying for Masters of Education on Curriculum Studies at the University of KwaZulu-Natal, Edgewood campus, Pinetown, South Africa. I am conducting a study to explore **Educators' Reflections on their Practices of Agricultural Sciences Curriculum and Assessment Policy Statement (CAPS)**. I have observed that educators are not aware of the issues between intended, implemented and attained curriculum in schools. I am intending to do an action research, thus, I am also involved in doing this research and I am also teaching Agricultural Sciences. Furthermore, to generate all the information to successfully complete my studies, your school is of paramount importance as it offers Agricultural Sciences. Therefore, I would like to kindly request to use your school and Agricultural Sciences educators to conduct this research project. Please note the following:

- The schools and educators' confidentiality is guaranteed
- The reflective activity, interview, and focus group may last for about an hour (1hour)
- Any information given by your educators cannot be used against the school, and the gathered data will **ONLY** used for the purpose of this research;
- Data will be stored in secure storage and destroyed after five years;
- Educators have a choice to participate, not participate or stop participating at any time they feel uncomfortable with the research;

- Real names of schools and educators will not be used, instead symbols such as S1, S2, and S3 will be used to present school names and educators' names;

- The research aims at knowing and understanding the challenges of your community relating to scarcity, peoples' movement and effects on peace;

- School and educators' involvement is entirely for academic purposes only, and there are no financial benefits involved.

I can be contacted at:
Cell: 073 396 1698 / 083 286 6259
Email: mbnkohla@gmail.com

My supervisor is Dr. Simon Bheki Khoza who is located at the School of Education, Edgewood campus of the University of KwaZulu-Natal.
His contact details are:
Phone: 031 260 7595
Email: khozas@ukzn.ac.za

Discipline Co-ordinator is Dr. LR Maharajh,
Curriculum Studies, School of Education,
Edgewood campus, University of KwaZulu-Natal
Phone: 031 260 2470
Cell: 082 202 2524
Email: maharajhlr@ykzn.ac.za

You may also contact the Research Office through:
Ximba Phumelele
HSSREC Research office,
Tell:031 260 3387
Email: ximbap@ukzn.ac.za

Thank you for your contribution to this research

DECLARATION

I, …………………………………………………. (Full names of the school principal) hereby confirm that I understand the contents of this document and the nature of the research, and I consent for the school and educators to participate in the research project.

I understand that the school and educators are at liberty to withdraw from their participation from the research at anytime, should they so desire.
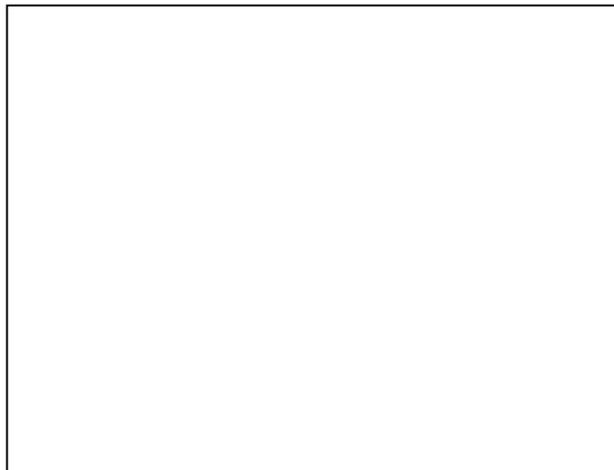
…………………………   …………………………...

Signature of principal   **Date**

SCHOOL STAMP

3. Appendix C – Consent form for the participant (educator)

<div align="right">
Mr MB Nkohla
Private Bag x 2234
Magugu Area, Ingwavuma
3968
15 April 2016
</div>

Dear Participant

<div align="center">INFORMED CONSENT LETTE</div>

I am Mr Msimelelo Buyisile Nkohla, an educator at Ingwavuma High School and a candidate studying for Masters of Education in Curriculum Studies at the University of KwaZulu-Natal, Edgewood campus, Pinetown. I am conducting a study explore **Educators' Reflections on their Practices of Agricultural Sciences Curriculum and Assessment Policy Statement (CAPS)**. I have observed that most educators are not well aware about the theories that underpin their teaching practices, and also issues between planned (intended) and implemented curriculum which yield different results (attained curriculum) in schools. I am conducting an action research, thus I am also involved in the research as I am an Agricultural Sciences educator. Therefore, to gather all the data to successfully complete my studies, I kindly request you to participate and answer some questions based on your experiences as an Agricultural Sciences educator.

Please note that:

- Your confidentiality is guaranteed as your contribution will not attributed to you in person, instead a report as population member option;
- The reflective activity, interviews and focus group may last for about an hour (1 hour);
- Data will be stored in secure storage and destroyed after five years;
- You are at liberty to withdraw your participation from the study at anytime you feel uncomfortable to continue;
- Your real identity and school name will not be used, instead symbols such as S1, S2 and S3 will be used;
- Your involvement is purely for academic purposes, and there are no financial benefits involved.

If you agree to participate in the research, please tick whether you **AGREE** (willing) or **DISAGREE** (Not Willing) to be recorded by the following equipment(s)

Equipment	Willing	Not Willing
Tape recorder		
Camera (Photography)		

I can be contacted at:
Cell: 073 369 1698/ 083 286 6259; Email: mbnkohla@gmail.com

My Supervisor is Dr. Simon Bheki Khoza. School of Education, Edgewood campus of theUniversity of KwaZulu-Natal. Phone: 031 260 7595. Email: khozas@ukzn.ac.za

Discipline Co-ordinator is Dr LR Maharajh.School of Education, Curriculum Studies, Edgewood campus, University of KwaZulu-Natal. Phone: 031 260 2470. Email: maharajhlr@ukzn.ac.za

Research Office:
Ximba Phumelele. HSSREC Research Office. Phone: 031 260 3587. Email: ximbap@ukaz.ac.za

Thank you for your contribution to this research.

PARTICIPANT DECLARATION

I,…..…………………………………………………………… (Full names of participant) hereby confirm that I understand the consent of this document and nature of the research, and I am willing to participate in this research study.

I understand that I can withdraw at anytime I feel uncomfortable.

…………………………………….   …………………………..

   Signature of the Participant   **Date**

4. Appendix D – Permission for the Department of Education

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

Enquiries: Phindile Duma   Tel: 033 392 1004   Ref.:2/4/8/761

Mr MB Nkohla
Ingwavuma High School
Private Bag X2234
Magugu Area
Ingwavuma
3968

Dear Mr Nkohla

PERMISSION TO CONDUCT RESEARCH IN THE KZN DoE INSTITUTIONS

Your application to conduct research entitled: **"EDUCATORS' REFLECTIONS ON THEIR PRACTICES ON AGRICULTURAL SCIENCES CURRICULUM AND ASSESSMENT POLICY STATEMENT (CAPS)"**, in the KwaZulu-Natal Department of Education Institutions has been approved. The conditions of the approval are as follows:

1. The researcher will make all the arrangements concerning the research and interviews.
2. The researcher must ensure that Educator and learning programmes are not interrupted.
3. Interviews are not conducted during the time of writing examinations in schools.
4. Learners, Educators, Schools and Institutions are not identifiable in any way from the results of the research.
5. A copy of this letter is submitted to District Managers, Principals and Heads of Institutions where the Intended research and interviews are to be conducted.
6. The period of investigation is limited to the period from 11 April 2016 to 30 June 2017.
7. Your research and interviews will be limited to the schools you have proposed and approved by the Head of Department. Please note that Principals, Educators, Departmental Officials and Learners are under no obligation to participate or assist you in your investigation.
8. Should you wish to extend the period of your survey at the school(s), please contact Miss Connie Kehologile at the contact numbers below
9. Upon completion of the research, a brief summary of the findings, recommendations or a full report / dissertation / thesis must be submitted to the research office of the Department. Please address it to The Office of the HOD, Private Bag X9137, Pietermaritzburg, 3200.
10. Please note that your research and interviews will be limited to schools and institutions in KwaZulu-Natal Department of Education.

UMkhanyakude District

Nkosinathi S.P. Sishi, PhD
Head of Department: Education
Date: 11 April 2016
KWAZULU-NATAL DEPARTMENT OF EDUCATION

POSTAL: Private Bag X 9137, Pietermaritzburg, 3200, KwaZulu-Natal, Republic of South Africa ...dedicated to service and performance
PHYSICAL: 247 Burger Street, Anton Lembede House, Pietermaritzburg, 3201. Tel. 033 392 1004**beyond the call of duty**
EMAIL ADDRESS: kehologile.connie@kzndoe.gov.za / Phindile.Duma@kzndoe.gov.za
CALL CENTRE: 0860 596 363; Fax: 033 392 1203 WEBSITE: WWW.kzneducation.gov.za

5. Appendix E- Ethical clearance (permission) from the University of KwaZulu-Natal

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

9 May 2016

Mr Msimelelo Buyisile Nkohla 2167074125
School of Education
Edgewood Campus

Dear Mr Nkohla

Protocol reference number: HSS/0498/016M
Project Title: Educators' reflections on their practices of Agriculture Sciences Curriculum and Assessment Policy Statements (CAPS)

Full Approval – Expedited Application

In response to your application received 04 May 2016, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully
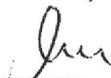
....
Dr Shenuka Singh (Chair)
Humanitities & Social Scinces Research Ethics Committee

/pm

Cc Supervisor: Dr SB Khoza
Cc. Academic Leader: Dr SB Khoza
Cc School Administrator: Ms Tyzer Khumalo

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukzn.ac.za
Website: www.ukzn.ac.za

1910 - 2010
100 YEARS OF ACADEMIC EXCELLENCE
Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

6. Appendix F – *Turnitin* (plagiarism) report

7. Appendix G – Reflective Activity

Full name/s and surname: …………………………………………………………….

School name: …………………………..........

Teaching Subjects: ………………………………………………………………

This interview requires you to elaborate further on your teaching practices of Agricultural Sciences CAPS.

Questions:

1. **Rationale**: Why do you teach Agricultural Sciences? _____
_____
_____

2. **Goals (Aim, Objectives and outcomes)**: Towards which goals are you teaching
Agricultural Sciences? _____
_____

3. **Teaching Activities**: Which activities do you use to teach Agricultural Sciences?
_____
_____

4. **Content**: What do you teach in Agricultural Sciences?
_____
_____

5. **Educator Role**: How do you facilitate learning of Agricultural Sciences?
_____
_____

6. **Resources**: What do you use to teach Agricultural Sciences?
_____
_____

7. **Accessibility**: How do you access the teaching of Agricultural Sciences?
_____
_____

8. **Environment/Location**: Where do you teach Agricultural Sciences?
_____
_____

9. **Time**: When do you teach Agricultural Sciences? _____
_____

10. **Assessment**: How do you assess learning of Agricultural Sciences? _____
_____

8. Appendix H- One-on-one semi-structured interview

Full name/s and surname: ………………………………………………………………

School name: ……………………………….......

Teaching Subjects: …………………………………………………………………

This interview requires you to elaborate further on your teaching practices of Agricultural Sciences CAPS.

<u>Questions:</u>

1. **Rationale**: Why do you teach Agricultural Sciences?

2. **Goals (Aim, Objectives and outcomes)**: Towards which goals are you teaching Agricultural Sciences?

3. **Teaching Activities**: Which activities do you use to teach Agricultural Sciences?

4. **Content**: What do you teach in Agricultural Sciences?

5. **Educator Role**: How do you facilitate learning of Agricultural Sciences?

6. **Resources**: What do you use to teach Agricultural Sciences?

7. **Accessibility**: How do you access the teaching of Agricultural Sciences?

8. **Environment/Location**: Where do you teach Agricultural Sciences?

9. **Time**: When do you teach Agricultural Sciences?

10. **Assessment**: How do you assess learning of Agricultural Sciences?

9. Appendix I – Focus-group discussion questions

This focus group discussion will require you to discuss thoroughly about your practices, and also requires one to share while they learn from others' input. Your reflections will be guided by the ten curricular archetypes.

Questions:

1. **Rationale:** Why do you teach Agricultural Sciences?

2. **Goals (Aims, Objectives and Outcomes):** towards which goals are you teaching Agricultural Sciences?

3. **Teaching Activities:** Which activities do you use to teach Agricultural Sciences?

4. **Content:** What do you teach in Agricultural Sciences?

5. **Educator Role:** How do you facilitate the learning of Agricultural Sciences?

6. **Resources:** What do you use to teach Agricultural Sciences?

7. **Accessibility:** How do you access the teaching of Agricultural Sciences?

8. **Environment/Location:** Where do you teach Agricultural Sciences?

9. **Time:** When do you teach Agricultural Sciences?

10. **Assessment:** How do you assess learning of Agricultural Sciences?