

**Incorporating African Indigenous Knowledge Systems into the Basic
Education curriculum: Experiences from two schools in the Gauteng and
KwaZulu-Natal Provinces, South Africa.**

By

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DECLARATION

I, **Lungile Cindi**, declare that the dissertation that I herewith submit for the Master of Philosophy in Africa Studies at the University of the Free State, is my independent work and I have not previously submitted it for qualification at another institution of higher education.

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30 November 2021

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ABSTRACT

South Africa is a proudly and richly diverse country with several indigenous groups across its nine provinces. Indigenous people have a vast array of knowledge by which they have lived and sustained their livelihoods for ages. The impacts of colonisation and globalisation have meant that over time, this knowledge has been lost and not imparted to younger generations. This challenge has intensified efforts towards preserving African Indigenous Knowledge Systems (AIKS). After 1994, one of the important goals that need to be achieved is social justice and this can be attained through inclusive education. Education needs to foster the diversity of our country and continent from the foundation face by placing value on AIKS. One of the ways in which this can be done is through its inclusion in the curriculum. There has been an increasing focus on Indigenous Knowledge Systems (IKS) and its value globally, with organisations such as the World Bank and the United Nations recognising the importance of this knowledge in achieving sustainable development for indigenous communities.

The current educational system in South Africa and many other African countries is still westernised and there have been many calls to decolonise the local curriculum. At the same time, there have been efforts to align the curriculum with constitutional principles and values through the *National Curriculum Statement (NCS) Grades R-12* and the *Curriculum and Assessment Policy Statements (CAPS)*. These principles and values include human rights, inclusivity, environmental focus, social justice and valuing of indigenous knowledge systems.

Through CAPS, educators are encouraged to make innovative use of various knowledge systems including indigenous knowledge to achieve inclusive education. There is, however, little mention of how educators should make use of IKS when teaching the different subjects that are in the curriculum. The focus of this study was, therefore, to find out how AIKS can be incorporated into the basic education curriculum in South African schools. The study also aimed to find out whether AIKS implementation at the classroom level is being realised. This was done by studying the educators' experiences with the incorporation of AIKS into the current curriculum.

To achieve the research's objectives, a qualitative study was conducted using the case study design, informed by the systems and symbolic interactionism theories. Two schools were selected, one from Gauteng and the other from KwaZulu-Natal. Both primary and secondary data sources were useful in reaching the findings. Focus groups were held with the educators from the schools. The semi-structured interview approach with a representative from the DBE broadened the scope of the study. Results were organised thematically in accordance with the research questions and objectives.

The findings revealed that although there is the requirement to include IKS in the curriculum, there is no clear indication of how this should be done. Educators require more support from the Department of Basic Education (DBE) in terms of direction on how to implement AIKS into their lessons. Educators also require training and material support. It was also evident that educators have an idea through their lived experiences of what AIKS is and were able to provide examples. Some have attempted minimally to use AIKS in their lessons. Mostly, the educators agreed that there is value in incorporating indigenous knowledge into the curriculum. There are however challenges that are experienced by educators in trying to include AIKS in their lessons, such as time constraints during lessons, lack of clear support and limited content and materials to achieve this goal. The themes that emerged during the study were AIKS and the rural context, indigenous games, folklore/storytelling, traditional medicines, restoration of pride and *Ubuntu* and sustainable livelihoods. Some of the recommendations that came out of the study were the development of AIKS content for teaching, the introduction of AIKS campaigns and drives in schools and communities, the inclusion of different role players in the AIKS development process and the development of monitoring and evaluation systems to track AIKS development progress. Further research can focus on learners' perspectives of AIKS and the development of different models that could form the basis of AIKS implementation in the curriculum. Further research is also suggested on the use of AIKS to improve the livelihoods of learners and their households.

KEY WORDS: Indigenous Knowledge, Indigenous Knowledge Systems, African Indigenous Knowledge Systems, Curriculum.

LIST OF ACRONYMS

ABS	: Access Benefit Sharing
AIKS	: African Indigenous Knowledge Systems
AKRSI	: Alaska Rural Systematic Initiative
ARCIK	: African Resource Centre for Indigenous Knowledge
BIKS	: Bachelor of Indigenous Knowledge Systems
CAPS	: Curriculum and Assessment Policy Statements
CAS	: Centre for Gender and Africa Studies
CEFIKS	: Centre for Indigenous Knowledge Systems
CHE	: Council on Higher Education
DAC	: Department of Arts and Culture
DBE	: Department of Basic Education
DSI	: Department of Science and Innovation
DST	: Department of Science and Technology
DST-NRF	: Department of Science and Technology-National Research Foundation
UKZN	: University of KwaZulu-Natal
DTI	: Department of Trade and Industry
EAH	: East African Herbarium
GET	: General Education and Training
GFC	: Global Fund for Children (GFC)
HEQC	: Higher Education Quality Committee
IFPP	: Indigenous Food Plant Program
IK	: Indigenous Knowledge
IKS	: Indigenous Knowledge Systems
IKSDCs	: Indigenous Knowledge Systems Documentation Centres
ITP	: Integrated Transformation Plan
KENRIK	: Kenya Resource Centre for Indigenous-Knowledge
LTSM	: Learning and Teaching Support Material
MIKS	: Masters of Indigenous Knowledge Systems
MNPC	: Multinational Pharmaceutical Corporations
MTA	: Material Transfer Agreement
NCS	: National Curriculum Statement
NECT	: National Education Collaboration Trust

NEPAD	: New Partnership for Africa's Development
NIKSO	: National Indigenous Knowledge Systems Office (NIKSO)
NISER	: Nigerian Institute of Social and Economic Research
NRC	: National Recordal System
NWU	: North West University
OBE	: Outcomes-Based Education
PIC	: Prior Informed Consent
RNCS	: Revised National Curriculum Statement
RSH&CC	: Regional San Heritage and Culture Committee
SABC	: South African Broadcasting Corporation
SACE	: South African Council for Educators
SADC	: Southern African Development Community
SA-SAMS	: South African School Administration and Management System
SASCE	: South African Schools Choral Eisteddfod
TEK	: Traditional Ecological Knowledge
ToK	: Theory of Knowledge
UFS	: University of Free State
UKZN	: University of KwaZulu-Natal
UL	: University of Limpopo
UNESCO	: United Nations Educational, Scientific and Cultural Organisation
UNISA	: University of South Africa
UNIVEN	: University of Venda
WLID	: World Learning for International Development
WGIP	: Working Group on Indigenous Populations

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

This chapter provides an overview of the study titled “*Incorporating African Indigenous Knowledge Systems into the Basic Education curriculum: Experiences from two schools in the Gauteng and KwaZulu-Natal Provinces, South Africa.*” The first part of the chapter introduces the problem statement that the research aims to address and thereafter provides the foundation from which the dissertation builds up, by outlining the study’s research questions. The section after that provides the background and rationale for the study, this part outlines why the research is necessary by drawing on already existing research about the subject and identifying how the study can add to the body of existing work. The breakdown of the research objectives and questions for the study are provided in the next section which is followed by a brief indication of the of the study as well as the research methodology. The chapter then provides a summary of the ethical considerations that have been undertaken in doing the research. Finally, an overview of the layout of the paper is provided.

1.2 PROBLEM STATEMENT

The research sought to understand how African Indigenous Knowledge Systems (AIKS) can be incorporated into the Basic Education curriculum. African societies have lived by indigenous systems, such as traditional medicinal, educational and agricultural systems for centuries. This knowledge is not, however, explicitly expressed in the education curriculum especially at the basic level. Khupe (2014: 13) in a study titled, ‘Indigenous Knowledge and School Science: Possibilities for Integration’, points out that recognising IK in education signifies that diversity in accordance with the South African constitution is acknowledged. In South Africa, there have been policies such as the Indigenous Knowledge Act 6 of 2019, National Indigenous Knowledge Systems (IKS) Policy and the National Curriculum Statement

(NCS) Grades R - 12 that aimed to ensure that IKS is regarded as an important part of education, with education being an important tool for development and a way of achieving socio-economic justice. These documents give expression to the value of IKS in the country and relate to the inclusion of the knowledge in education. The extent however to which IKS has been included is still to be determined. The curriculum is also mostly westernised as is the case for former colonies. One of the ways to decolonise the education system is through the incorporation of AIKS in the school curriculum in the case of South Africa. This will in turn, have a positive effect on the preservation of this knowledge which over time is being gradually lost.

Through the education curriculum, Indigenous Knowledge (IK) may be passed on formally to subsequent generations and preserved. This research explores the incorporation of AIKS in the Basic Education curriculum to determine how and to what extent this is being achieved in South Africa. The researcher attempted to find out what work has been done to ensure that the education system recognises the importance of this knowledge as identified in documents such as the IKS policy of 2004, the IKS Act 6 of 2019 along with the Curriculum Policy Statements in South Africa. The knowledge is seen as being a valuable tool for social justice and can potentially be used to decolonise the education system of the country when done correctly.

1.3 BACKGROUND AND RATIONALE

Africa is rich in knowledge, but there is a danger that this knowledge is being lost through exploitation and lack of acknowledgement of the knowledge holders. For instance, there are case studies that show the global commercial exploitation of indigenous medicinal knowledge. Research in Cameroon has shown that the bark of *Prunus Africana* has been discovered to possess important properties that are anticancerous in addition to other benefits. This has resulted in the illegal debarking of the tree, causing many trees to die and also posing a threat of the species becoming extinct (Bodeker, 2000:1). The single holder of a commercial exploitation license for the collection and exporting of the bark to the European market is a French company.

The profits from this are not redirected to Cameroon, the citizens of which are remunerated for the collection of the bark only (Bodeker,2001).

Another example of such practices is the case of the South African Devil's Claw plant, which has gained global importance in terms of being a medicinal plant. The more interest there is in the healing potential of the plant means that there is a danger of over-exploitation of wild resources. In addition, those who are original holders of the knowledge about the healing properties of the plant, do not have a share in the commercial success of the plant (Jordaan, 2001: 85).

African IK potentially holds many benefits for the people of this continent and may be a tool for them to improve their lives. Some of the benefits can be financial, where the community custodians of AIKS use the knowledge to gain financial benefits either through protected commercialisation of practices such as in agriculture, or bioprospecting. An example of this is currently one of the powerful medicines used for the treatment of childhood leukaemia, extracted from the rosy periwinkle, one of the plants used by traditional healers in Madagascar (Jordaan, 2001: 77).

There are also health benefits that can be derived from reliance on IKS and in Africa, indigenous medicine produced from plants play a significant part in the healthcare of many people. Local communities have continually utilised and handled natural resources to take care of their health needs. Losing this knowledge can have many detrimental effects for generations to come, including loss of self-identity and history, loss of possible future income, overuse of resources and damage to the environment due to practices that are not aligned with the community's interests.

The continent faces many challenges for which solutions could be found in the African stores of IKS. In a study with the Ikale-Yoruba people, Olukoya (2006) maintains that the use of the Ikale's IKS aided the farmers in becoming specialists in that region when it comes to food crop production in South-Western Yoruba land. In addition, he makes a point that contemporary approaches to agricultural development in Africa will not succeed lest those practices take into mind Africa's home-grown agricultural methods and IKS. Yoruba IK is rooted in taking into account all domains of human activity and forms and their relevance in the foundation of development. An analysis of Yoruba

traditions reveals the levels of the tribe's knowledge and shows a rare commitment to analysis, research, investigation and the practical use of knowledge to solve human problems (Aluko, 2018: 2).

Some developmental challenges faced by the continent can be linked in part to colonisation and its after-effects which are ongoing such as the increasing level of poverty and inequality in Africa, political instability, the exploitation of resources, corruption and mismanagement of resources. As stated by Park:

'The influence of the West in terms of political, economic and social institutions, as well as popular cultures and the 'modern' way of life, has been dominant in the rest of the world and this continues under globalization, although now there are more players in the region' (Park, 2019: 9).

To deal with these developmental challenges and achieve sustainable development, education models (education being a key tool in achieving development) need to be devised to specifically suit the environment and conditions on the continent, as opposed to adopting westernised models in their entirety. According to Gboku and Lekoko (2007), a formal education system in Africa can play a vital role, adding to personal development as well as the development of communities. They go on to mention that in order for such a system to be able to meet the requirements of Africa such as cultural, social, moral and intellectual including the political and economic needs, it has to be modified by integrating IK into it. It is important then to look within, to unearth the knowledge that will uplift the poor.

IK in Africa has played a pivotal role in how communities lived sustainably in the past. Magni (2017: 438) writes that being aware and mindful of indigenous people's sustainable way of living and the worsening state of the planet, have lately sparked the interest of the international community in IK and the practices thereof. This is therefore a very crucial area to explore for research to be able to understand the benefits and challenges that would arise in the incorporation of AIKS in education and how that could be a valuable tool for the achievement of social justice especially for previously marginalised groups.

Studies on IKS are crucial in order to preserve the knowledge. The value of such knowledge is also recognised by the World Bank (WB) (2016) in an article that highlights the important role played by Indigenous People and IK in the preservation of biodiversity. According to the WB, 80% of the world's biodiversity that is still intact, is protected by indigenous people, whereas they only make use of just 25% of the world's surface area. Several biologically important natural resources are undamaged due to Indigenous Peoples' management. Indigenous People have important knowledge that they carry from their ancestors, they also know ways of how to navigate and counter the risks of climate change (The World Bank, 2016).

Over time there has been an increase in studies related to IKS, with an interest in knowing how IK can be used in areas such as the conservation of the ecology biodiversity, the management of land, natural resources and wildlife and also in the health and education areas (Agrawal, 1995). IK has been used more and more as a solution for many of the problems caused in some instances by strategies that were intended for development during the previous decades. For example, its importance is also noted for worldwide health development. The World Health Organisation (WHO) in the Health for All Declaration (1978) highlighted in its recommendations that there is a need to include local people's traditions and practices in Primary Health Care (PHC), however, even with these recommendations, some still see indigenous health practices as being backwards and unevolved. This is just one example of a subject area where we see IK being thought of as no longer relevant or too unsophisticated to be fully recognised in formal education.

When it comes to IK, the knowledge is passed on from the older generations. The knowledge is passed on in different methods, mostly orally in the form of poetry, stories, music, folklore and using proverbs, the inheritance of this knowledge from past generations is vital. In the past, the conveyance process may have also included performances or even been entrenched in popular culture (Johnson, 1997). Other sources of information such as books are supported by oral transmission of the past. A major goal for the preservation of IK is to show what role different groups played and instil national pride while also resulting in rebuilding the nation.

The United Nations (UN) Declaration on the Rights of Indigenous Peoples (2007: 7) states that

‘Indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning’

This highlights the important role that local indigenous communities have to play when it comes to education in South Africa. Communities must be active participants in the development of curricula if IK is to be successfully included in education.

In line with this, Act No. 6 of 2019: Protection, Promotion, Development and Management of Indigenous Knowledge Act, 2019, speaks to the importance being placed in IK especially in terms of its protection and use in South Africa. Key aspects of the Act (2019: 2) speaks explicitly on

‘recognising that indigenous knowledge is a national asset and that it is therefore in the national interest to protect and promote indigenous knowledge through law, policy and both public and private sector programmes; wishing to encourage the use of indigenous knowledge in the development of novel, socially and economically applicable products and services; accepting that indigenous innovation is a unique approach to social innovation that informs and underpins the work of indigenous communities’.

Chapter 2 of the Act (2019: 10) speaks to the application and objectives of the Act, among others, which is to make provision for the registration, cataloguing, documentation and recording of IK owned by indigenous societies. This is another step that will be crucial in the use of the knowledge, especially in the curriculum.

There have been calls to decolonise education in South Africa, notably during the ‘FeesMustFall’ and ‘RhodesMustFall’ protests where one of the issues raised was the decolonisation of education in the country. The minister of Basic Education also called for the decolonisation of education referring to IKS as one of the tools to achieve this.

Therefore, in the context of South Africa, incorporating AIKS in the curriculum could be one of the steps to achieve the decolonisation of education. Decolonising the school curriculum is seen as important in addressing and demystifying the philosophies around class, gender, ethnicity, ethnocide, inequality and race that inform colonialism to learners in schools in an age-appropriate manner. The westernised approach of understanding and applying economics, education, law and science must be contextualised to address the persistence of past inequalities and to provide space for interpreting and implementing those areas from an African perspective and from within African contexts (Lebeloane, 2017: 7). A part of the African perspective and contexts is the need to consider how Botho/Ubuntu can be retained and sustained in curricula (Lebeloane, 2017). That includes the preservation and development of culture, dignity, language, norms and values (Lebeloane, 2017: 8). As Badat (2015) puts it:

“...unless much needed academic transformations are instituted, we will deny opportunities to people from socially subaltern groups, tragically waste the talents and potential of these individuals and perpetuate injustice. This compromises democracy...” (Badat, 2015).

In an article in the Mail & Guardian (24 March 2017) which highlighted the plans to decolonise the curriculum in South Africa, the inclusion of Kiswahili as a language to be optional as part of extramural activities is part of the plans for decolonisation intended to be implemented between 2020 and 2030. In addition, other plans include having IKS in schools, and the teaching of learners in their home language from grades 1 to 3 to grades 4 to 6, as well as by making history compulsory at schools (Mail & Guardian, 2017).

In South Africa, the importance of IK is being recognised by the DBE. For instance, the role of IKS has been recognised in policy documents such as the Curriculum and Assessment Policy Statement (CAPS) for Natural Science and Life Science (DBE, 2011) amongst others. The National Curriculum Statement (NCS) Grades R - 12 indicates what is viewed to be knowledge, skills and values worth learning. It ensures

that learners obtain and use knowledge and skills in ways that add meaning to their lives. In this regard, the adaptation of knowledge to local contexts is promoted by the curriculum, whilst taking into account global requirements. In relation to Life Sciences, it can be seen that DBE has started placing importance in IKS. The document states that the third objective of Life Sciences as a subject area is to equip learners to recognise that school science can be applicable to their lives outside school and that it enhances their lives. The document explicitly states that:

'Learners must be exposed to the history of science and indigenous knowledge systems from other times and other cultures. Scientific knowledge and understanding have been developed over time by people who were curious and who persevered with their quest for knowledge. Our present understanding of science will change and will be improved by modern scientists making new discoveries' (Department of Basic Education, 2011:17).

This is only one example of a subject where IK can be incorporated into the classroom. With further research, it will be evident that there is a place for IKS in many more school subjects. South Africa's education curriculum has gone through various changes especially since 1994. The change was necessitated by the need to have an education system that is inclusive and speaks to the country's constitution which aims to promote democracy. The Department of Education (DoE, 2003) believes that when creating policies, the values, traditions and culture of any society play an important consideration and that the interests of society must be taken into account during any change. Since it has been noted that the general aims of the country's curriculum are to mainly indicate the knowledge, skills and values to be learned in South African schools. In this regard, we can see that the addition of AIKS to the curriculum would be a way of including societal interests in schools.

Another objective of the curriculum is to make sure that despite learners' socio-economic backgrounds, gender, physical abilities and race, they are equipped with the knowledge, skills and values necessary for their empowerment as well as meaningful partaking in society as citizens of a free country. The curriculum aims to produce learners who will show an understanding that when solving a problem, it cannot be

done in isolation of the context and see the world as a set of related systems (Adu & Ngibe, 2014: 987). The aim of the South African curriculum, as can be seen, is much more than producing learners that pass but those that will participate in their environment for its betterment.

There is certainly no doubt that AIKS has great value for the expansion of the curriculum to create social justice for all people in a society equally. It is thus extremely important that such knowledge is preserved and passed down through generations who will use it to ensure the renewal and success of their communities in Africa. In the context of the curriculum, incorporating AIKS can help achieve the purpose and aims of the curriculum mentioned above. A case then can be made for incorporating AIKS into the schooling curriculum in South Africa. The question arising is if this is being done, and if so, how is it being incorporated?

1.4 RESEARCH OBJECTIVES

The primary objective of the study was to explore whether and how African Indigenous Knowledge Systems (AIKS) are currently being incorporated into the Basic Education system by sharing experiences from two schools as case studies. The secondary research objectives were:

- To explore the different types of AIKS that form part of teaching in the selected schools.
- To explore the prospective benefits that may result from the incorporation of AIKS into the formal school curriculum.
- To explore the challenges faced in the incorporation of the AIKS in the Basic Education curriculum of the two selected cases.
- To describe how AIKS can be made part of the Basic Education curriculum in South Africa.

To explore this matter, the study looked at the following main research question:

What have been the experiences in incorporating AIKS into the Basic Education curriculum for two South African schools, in Gauteng and KwaZulu-Natal respectively?

Aligned to the objectives and the main research question, were the following sub research questions:

- What types of AIKS form part of teaching in the selected schools?
- What are the prospective benefits of incorporating AIKS into the formal school curriculum?
- What are the challenges faced in the incorporation of AIKS in the Basic Education curriculum of the two selected cases?
- How can AIKS be made part of the Basic Education curriculum in South Africa?

The scope in which the above research objectives and questions were contextualised is discussed in the next section.

1.5 SCOPE OF THE STUDY

The study was conducted in the Gauteng and KwaZulu-Natal provinces, South Africa, during the period, 2020-2021. In the Gauteng province, the study was undertaken in the Ekurhuleni area and in KwaZulu-Natal, in the rural Bergville area. The research draws on extant IKS literature related to African indigenous knowledge, as well as IKS related scholarship from as far afield as India, Brazil and Switzerland. Examples of different cases from different countries are used as part of the literature review on IKS. In the empirical research, two schools from South Africa were purposively sampled as case studies, with the goal of exploring how they have attempted to incorporate indigenous knowledge in the curriculum, if at all and what the possible advantages and challenges may have been. The aim is to have representation from two different provinces while including both rural and urban schools.

The scope was extended to include the DBE which formed part of the research, by looking at the plans and resources that have been put in place for incorporating AIKS into the curriculum and what has been achieved so far. This provides an indication of some of the achievements in the area of making AIKS part of the curriculum as well as the challenges from the department's perspective. The case studies of the schools focused mainly on primary school level education, but the literature review provides examples of secondary and tertiary institutions as part of background information. The research intends to document various subject areas in which AIKS are being incorporated in the curriculum, whether Maths, Science, History, etc.

1.6 IMPORTANCE OF THE STUDY

The study is important because it adds to the body of knowledge that seeks to address the issues of the preservation and protection of IK and is important in the search to finding alternative ways of ensuring the empowerment of communities. The research documents one of the ways that this can be done, by incorporating the knowledge into the Basic Education curriculum using educators' experiences. This will assist the DBE in identifying where the challenges are when it comes to IKS and its inclusion in the curriculum. The educators will be benefiting from this study by engaging and expanding their understanding of IKS in general and specifically what AIKS is available to them and its benefits. In addition, they will find ways in which they may improve teaching experiences by sharing knowledge and experiences. The recommendations add to the practical solutions for ensuring that such knowledge is available for future African generations. The study provides examples on how practically this knowledge can be incorporated into the schooling curriculum in South Africa by looking at the respective case studies. The study also informs further research in the area of AIKS while its recommendations could be used to inform policy directives in the education sector and to strengthen policy on the use and preserving of IKS in the country.

1.7 RESEARCH METHODOLOGY

The research used the qualitative paradigm to explore the research questions raised by the study. Qualitative research examines experiences whereby “the qualitative researcher seeks to become immersed with the object of study” (Auriacombe, 2015: 36). The capability of qualitative data to describe a phenomenon more fully is an important aspect to consider not only by the researcher, but from the reader's perspective as well (Hoepfl, 2007: 1). Qualitative research papers characteristically have more detail and perceptions into the worldly experiences of the participants. This type of research is rooted in its purpose of trying to understand some part of social life and its approaches which generally generate words, rather than numbers, as data for analysis (Hancock, Ockleford & Windridge, 2007:4).

This research aimed to understand the perspectives of participants regarding the IK and its value in their lives specific to the educational sphere. The predominant goal of the research was to explain how knowledge can be incorporated into schools. It also aimed to explore the role of IK in the lives of its knowledge custodians in Africa. The use of a qualitative method ensured that it was not only the perspective of the researcher that comes forth.

This research used the case study research design and purposively sampled two schools as cases. A case study is “an exploration of a bounded system or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context” (Creswell, 1998:61). Yin (2009: 19) adds that a case study is suitable when studying an occurrence in depth and within its real-life context.

The schools were selected from two provinces, Gauteng and KwaZulu-Natal. One of the schools is from a rural area, the reason being to provide the research with a greater scope of different experiences from areas with different socio-economic situations. In order to select the schools, the researcher firstly identified areas that were easily accessible where the research could be done. These would be areas the researcher could easily travel to, the areas in which the researcher would not have problems

communicating, i.e., the researcher being fluent in the language of the area, which in both areas was predominantly IsiZulu. After having selected the area, primary schools in each area were identified and contact details using the DBE website were collected. Principals of the schools in the area were contacted and asked whether they are incorporating IKS into the curriculum or if they wish to do so in the near future. From this school contact, the researcher made a decision on which schools to use in the study, based on availability, accessibility and will to contribute to the research.

In summary, the study was therefore:

- Exploratory in the sense that the researcher sought to discover knowledge about the indigenous knowledge systems and practices in the certain selected schools in South Africa.
- Descriptive because of the description of concepts and ways in which AIKS can be preserved for future generations to learn about using the school curriculum.
- The research was also explanatory, showing how the education system can incorporate AIKS in schools.

This study was underpinned by the Systems Theory. According to Von Bertalanffy (1974), a system is made up of a number of subsystems or parts, which are intertwined and also dependent on each other to accomplish a purpose as a whole. This theory is useful to understand how incorporating IK can also result in an efficient education system ensuring that IKS is preserved and used in schools. Studies on IKS can also be underpinned by Symbolic Interactionism since these systems vary and humans place symbolic value on their interaction such as that with the land, plants and each other.

1.8 ETHICAL CONSIDERATIONS

The study conformed to the prescribed institutional ethics of informed consent, confidentiality, integrity and honesty and the rules regarding plagiarism of the University of the Free State (UFS). These ethical principles were highly regarded by the researcher. Permission letters were obtained from the Gauteng Department of Education and the KwaZulu-Natal Department of Education to conduct research at the

schools as per their prescribed requirements. A permission letter was also obtained from the DBE to conduct an interview with one of the directors in the appropriate department. Permission was obtained from the schools chosen through the principals and participants to conduct research within the chosen area. Consent forms were used to guarantee the anonymity and confidentiality of participants. The researcher ensured that all relevant IKS documents in South Africa such as the IKS Policy of 2004, Protection, Promotion, Development and Management of Indigenous Knowledge Act 6 of 2019 and Indigenous Knowledge Systems Research Ethics Policy (DST, 2015) are reviewed to ensure that research is conducted in accordance and in line with the guidance of legislation.

1.9 CHAPTER LAYOUT

This study was presented as a dissertation with six chapters – Chapters 1 to 6. These chapters are outlined below:

Chapter 1: Introduction

The chapter provides a presentation of the research topic, problem statement and also presents the background and rationale for the study. It outlines the research design and the methodology that will be adopted in the following chapters.

Chapter 2: Literature Review

This chapters reviews and discusses the literature. The key concepts are defined and the main arguments are outlined. The chapter also highlights the underlying theoretical framework of the study.

Chapter 3: Topic Background: Incorporation of Indigenous Knowledge Systems in the schooling curriculum

This chapter provides the background to the topic on African Indigenous Knowledge Systems and how the knowledge can be incorporated into the schooling curriculum. It provides the key issues that are important to the topic which have been picked up during the review of the literature.

Chapter 4: Research Design and Methodology

The chapter explores the research methodology, methods and techniques utilised to gather data for analysis during the case study. Issues of sampling, ethical considerations and trustworthiness area also discussed in this chapter.

Chapter 5: Results – Presentation and Discussion

The chapter provides a sample profile for the case study undertaken. The findings of the case study are also presented and discussed in this chapter.

Chapter 6: Summary, Conclusion and Recommendations

This chapter summarises and discusses the main findings in terms of the literature review, theory and stated objectives and provides recommendations for policy development and further research.

1.10 CONCLUSION

This chapter presents the overview of the study by providing the research topic along with the research problem that the study aims to address. The rationale and background of the research were provided to give the reader an idea of why it is important to do the research. In presenting the background, the research objectives were formulated which seek to answer the research question arising from the problem statement. Other aspects that were considered for the research mentioned in the chapter include the scope, limitation and importance of the study. The chapter also briefly describes the research methodology that was applied in the study. The ethical considerations that have to borne whilst conducting this study are laid out. Finally, it presents the chapter outline of the whole study. The next chapter reviews the literature on the study's subject matters.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Chapter 1 introduced the title of the research and described the study's problem statement, background and rationale, research objectives as well as research design of the study. In providing the background to strengthen the case, various literature sources regarding IKS were referred to. In this chapter, a review of the relevant literature and research related to IKS and the curriculum will be provided. Over the past decades IK has become a focus of not only public deliberation but also research globally. The interest in the subject is in learning more about the various IK systems that exist and the value that this knowledge has.

The inclusion IK in education has also attracted much research in different parts of the globe. This has been sparked by the intention of creating education for learners that can be relatable to the experiences of their everyday lives and environment. In South Africa, the school curriculum has been at the centre of reform, since the end of the apartheid rule. There have been changes in the curriculum which have resulted in the acknowledgement and valuing of IKS as one of the principles of the curriculum and a move in emphasis from subject matter to a curriculum that puts the learner at the centre by focussing on learning outcomes (DoE, 2003).

The chapter begins by clarifying the major concepts that form part of this study such as defining IK, IKS, AIKS and Curriculum. This is important because throughout the study these terms are used, in some instances, IKS is used since there are many systems globally and the literature provided refers to IKS, whereas in some instances, especially when looking at South Africa, AIKS is referred to, to indicate that the study although broadly focusses at IKS, it however uses examples of AIKS from educators since we are operating from the context of Africa

Once the terminology has been explained, the important literature relating to IKS in school curriculum is reviewed. This is done by firstly, assessing the major

characteristics of the South African school curriculum and highlighting some of the changes that it has undergone over the years to date. The section following this, will focus on some of the benefits that can be derived from incorporating IKS in the formal school curriculum. There have been various attempts and literature written on incorporating IKS in curricula, the literature has shown that doing this is not without any challenges, especially because of some of the ways in which this knowledge is perceived. Some of these challenges are reviewed in the chapter.

One of the concerns about IKS is how this knowledge can be preserved. This has been part of the focus of some of the research in this area. Some of the ways in which the knowledge can be preserved are discussed. It is also important to look at some of the examples from literature on how the incorporation of IKS in education has occurred and in which areas. This will assist in identifying best practices and gaps that will strengthen the recommendations for practical solutions in the case of the South African Basic Education curriculum. The analysis of concepts and relevant literature assists in the understanding of the theoretical framework that underpins this research. The last section of the chapter explains the theoretical framework for the study after having identified the research problem statement and research objectives.

2.2 CONCEPTUAL FRAMEWORK

This section defines the study's major concepts. These are IK, IKS, AIKS and the concept of a curriculum. It starts with the definition of Indigenous Peoples.

2.2.1 Indigenous Peoples

It is important to unpack the concept of Indigenous people before moving forward with the study, especially in a diverse country such as South Africa. This will help in creating a sense of awareness and sensitivity towards the topic of IKS and the rightful knowledge holders as well as the current intellectual and political challenges that are linked to this concept, such as who are the indigenous people and what are their rights. Across literature, there is no fixed definition of the term indigenous peoples, however, the Chairperson-Rapporteur of the United Nations Working Group on Indigenous

Populations (WGIP) has listed the following aspects which are considered relevant to the understanding of the concept of “indigenous”: a priority in time; the voluntary perpetuation of cultural distinctiveness; an experience of subjugation, marginalisation and dispossession; and self-identification (Asia Pacific Forum & United Nations, 2013:7). In many cases, the term indigenous is used to refer to those people who are descendants of the original populations residing in a country. For Africa this raises issues since, Africa is the continent with the longest history of human occupation, and it contains the greatest range of human genetic and cultural diversity (Hitchcock & Vinding, 2004: 8) ,as also reflective in the South African case.

The meaning of the concept indigenous people is controversial globally, and South Africa is no exception. Currently, there is no accepted South African standard of the definition. Two parallel definitions can be identified, one referring broadly to all South Africans of African ancestry, the other developing along the lines of the United Nations WGIP, which refers to non-dominant groups of aboriginal or prior descent with distinct territorial and cultural identities (Chennells & du Toit,2004:98). Stemming from the context of the latter meaning, there is further debate as to which groups would be included. The groups mostly referred to under this definition in South Africa are the San groups, as well as the Nama and Griqua, who are collectively referred to as the Khoe (Chennells & du Toit).

Although there is no clear and agreed upon definition of indigenous peoples, it is still important to have mentioned the different variations that exist, along with the current debates around the concept especially in South Africa as background to the issues that might affect research around the area of IKS.

2.2.2 Indigenous Knowledge (IK)

IK refers to knowledge and expertise that is specific to a particular society or culture and includes “the cultural traditions, values, beliefs and worldviews of local people” (Agrawal, 1995: 418). As recognised in the Principles and Guidelines for the Protection of the Heritage of Indigenous Peoples, IK is a “complete knowledge system with its own concepts of epistemology and its own scientific and logical validity” (Battiste, 2002: 7). In the South African context:

'IK is generally used synonymously with traditional and local knowledge to differentiate the knowledge developed by and within distinctive indigenous communities from the international knowledge system generated through universities, government research centres and private industry, sometimes incorrectly called the Western knowledge system.' (Department of Science and Technology, 2004:10).

The meaning of IK and traditional knowledge are closely linked, however there are some differences. For instance, not all traditional knowledge is part of IK, but all the IK is a subgroup within traditional knowledge. This can be explained with the indication that traditional knowledge, whether indigenous or not, may have been created by an individual or community. Therefore, IK also belongs to the category of traditional knowledge. IK and traditional knowledge share many similar features, for instance, being unwritten in some cases, based on custom, practical, experience-oriented and holistic. It explains why traditional, and IK are used regularly in the same framework. Traditional knowledge is a broad category that includes IK as a type of traditional knowledge possessed by the indigenous communities. (Thailand Law Forum, 2009).

Traditional knowledge can be explained as that part of local knowledge that is passed down through generations over time as opposed to that part of local knowledge that is derived from contemporary learning (World Agroforestry Centre, 2014:5). In comparison, IK is knowledge developed over time by a people in a particular area and that has also been transmitted from generation to generation over. IK however also encompasses both the traditional and the contemporary ways as it continues to expand and develop. IK has often been referred to as traditional knowledge because some people view it as unchanging knowledge based only in the past (Chrona,2014). This is not a true reflection since IK evolves. Battiste (2005) states that

'In Eurocentric thought, Indigenous knowledge has often been represented by the familiar term "traditional knowledge," which suggests a body of relatively old data that has been handed down from generation to generation essentially unchanged. Indigenous knowledge is an adaptable, dynamic system based on skills, abilities,

and problem-solving techniques that change over time depending on environmental conditions.’ (Battiste, 2005)

IK is also defined as comprehensive knowledge that covers the techniques and practices that indigenous peoples have used as part of their existence, endurance and adaptation in other environments. The knowledge advances and varies through its development, it influences and is impacted by both internal and external conditions which include interaction with other knowledge systems. IK enfold material and contexts such as agriculture, architecture, engineering, mathematics, governance and other social systems and also diverse medicinal and indigenous plant content among others. (Onwu & Mosimege: 2004).

2.2.3 Indigenous Knowledge Systems (IKS)

IKS can be defined as “that body of accumulated wisdom that has evolved from years of experience, trial and error as well as problem solving by groups of people working to meet the challenges they face in their local environments, drawing upon the resources they have at hand” (Green, 1994: 20). IKS are described in the South African Revised Curriculum Statements as "a body of knowledge embedded in African philosophical thinking and social practices that have evolved over thousands of years" (DoE, 2002:9). IKS is used to manage the socio-economic, environmental and spiritual aspects of life (Hoppers, 2005: 2), stored in the collective memory of a community. It refers to a set of knowledge and practice that is verbally transmitted to future generations through stories, myths and songs. For this study, knowledge and practices of the areas where the chosen schools are located were identified in order to observe how it is or could be applied in the classroom.

2.2.4 African Indigenous Knowledge Systems (AIKS)

The key characteristics of AIKS are echoed in its all-inclusive approach since it encompasses all features of life. It is somewhat fragmented since no single person or

entity knows all of the knowledge. Another feature is that it is based on community and although the knowledge is usually unwritten, it is orally preserved and also through the collective memory and characterised by customary practices, rituals, proverbs and storytelling. AIKS is adaptive in nature and does not exist in totality (Dondolo, 2005: 115). Responding to the question as to why IK is often referred to as a system, Nel (2008) argues that:

“ a system refers to the holistic nature of the knowledge as it links up and relates to all aspects of life and the environment as it also refers to the plurality of both its properties and functions. Finally, similar to any discipline, AIKS embody ethical standards, standards of responsibility, transmission and a ‘system of rules and practices”. (Nel, 2008)

In this study, AIKS refer any IKS practices in any of the areas in Africa. For instance, The Yoruba IKS covers all facets of human life, including its commitment to the natural environment. These systems are essential to the survival of the people who created them. They are collective and signify generations of experience, careful observation and trial-and-error experimentations (Ajala, 2009). Yoruba IKS would then form part of AIKS. Banda (2008:68) states that it is not uncommon in many African countries and for some researchers to use the term ‘African’ when they are writing about IKS of different African countries. For instance, in his study he refers to the Chewa AIKS, which is influenced by the type of society they belong to as a tribe. He explains that the Chewa AIKS had a well-established organisational structure with family as a starting point and then society. Socialisation agents in the AIKS include ceremonies, dances, peer groups etc. methodologies of the Chewa AIKS include folktales, proverbs, riddles figures of speech and oral literature. This is characteristic of IKS across Africa (Banda, 2008:110). Although some practices might be unique to the Chewa, the IKS forms part of AIKS. Another example is the IKS of the Asantes in Ghana which includes cosmological beliefs, taboos, totems, myths, folklores, proverbs, festivals, songs etc. The Asante forebears intentionally created the proverbs, folklores, myths and others which constitute the Asante indigenous systems with the view of conserving the biodiversity resources in nature that serve as life support (Adom, 2016).

2.2.5 Curriculum

There are a number of variations of the term curriculum in the literature. According to Hewitt (2006), the term refers to the content structure made available to learners such as scientific literacy which is in accordance with the requirements of the authority responsible for the school and schooling. This is usually based on state law. Curriculum is a way of accomplishing detailed educational goals and objectives. It can be viewed as an outline of outcomes that are desired by the educational system. During the process of developing a curriculum, the objectives must be clearly specified. Another way of understanding the term is by viewing it as a course or content selection process (Beauchamp, 1977). In this case, the curriculum defines or proposes the content and purpose of formal education, but also puts down the methods of instruction. In the views of Barrow and Milburn (1990:84):

‘This is seen in the way curriculum has become associated with the official written programs of study published by ministries or departments of education, local authorities or boards of education and commercial firms or teams of educational specialists working on specially funded projects’ (Barrow & Milburn, 1990: 84).

There is another way in which this concept can be defined, for instance, instead of seeing curricula in a narrow lens as classroom content that is formal or prescribed learning goals, experiences are incorporated in the definition. This is how this study will look at what curriculum as a concept means, by also incorporating other learning experiences applied in the classroom. Marsh (1997: 5) suggests defining curriculum as “an interrelated set of plans and experiences which a student completes under the guidance of the school”.

2.2.6 Westernisation and colonisation

These concepts of westernisation and colonisation will be discussed together because of how closely related they are, in this case, mentioned in the context of the African continent. It is important for this study to understand these terms because it is through their impact, that the need for research such as this is necessary. Westernisation is

defined in the American Heritage Dictionary as an “assimilation of Western culture; the social process of ... converting to the customs and practices of Western civilization”, customs and practices in general rare in relation to such areas as industry, technology, law, politics, economics, lifestyle, language, religion, or values; and the term ‘Western’ is in referral to both American and western European cultures (Scott, 2007: 10). Scott (2007: 10) further states that westernisation is generally a process that has two sides. The Western influences must be encountered by a desire of at least a portion of the group to be affected to move towards a lifestyle such as that of the western society. Without this two-sided aspect of the process, it would be regarded as colonisation rather than westernisation. Westernisation borders on cultural rather than physical colonisation.

Physical colonisation is the expansion of an autonomous state over a region outside of its actual designated borders. With both westernisation and colonisation there is in general a domination of the resources, labour and markets, there may also be the imposition of sociocultural, religious and linguistic structures on the indigenous people. It is apparent that colonisation and westernisation are closely related concepts and in South Africa, their effects are very evident in everyday lives (Scott, 2007:11). Arowolo (2010) argues that Colonialism is a means of implanting cultural imperialism in Africa. In this setting, it serves as an imposition of rule that is foreign over indigenous political context. The goal is to have dominance over the population of Africa, in all domains of their socio-economic, political, cultural and religious lives. The dominance and subjugation meant that Western way of life flourished and took over African cultural heritage. The above assertion is supported by Kasongo who states that:

‘one could infer that when westernisation was imported to African countries, the hidden side of modernism was materialist interests. Civilisation was just another concept of domination: imposition of incoming new culture over traditional cultural Values’ (Kasongo, 2010:314).

For the purposes of decolonisation, having an understanding of the colonised groups, those that colonise and their relationship with non-Western society shows the goals of the colonisers within the grand enterprise of control and exploitation. It is essential to

observe those who create knowledge and their social, economic and political positions within the colonial settings to comprehend the marginalisation of IK. This connection created the basis for the domination of IK by Western knowledge (Akena, 2012: 600). Western involvement in Africa led to denunciation of Africa's originality, the continent's authentic practices were belittled, which in turn meant that the Africans' setting, living experiences, lifestyle, including cultural values, belief systems and educational structure and curriculum were seen as being non-progressive, unscientific and barbaric. With these misconceptions of Africa being created, there was intensive effort intended at imposition of the Western thinking over that of the African. This was mostly planned in a strategic manner, through the controlled educational system which was established by the colonisers. IKS, being a product of the environment, should be the basis upon which the formal education system of any society is created, has been consistently and deliberately been displaced to lower positions (Ezeanya-Esiobu, 2019:1).

2.2.7 School in a rural area

In this study, the concept of a 'school in a rural area' is used when referring to one of the case studies schools (School B). This describes a school that is physically located in a rural or non-urban environment and is subject to the socio-economic challenges that are faced by rural communities. There are several features that are characteristic of rural areas which have a negative effect on the delivery of quality education in those areas. Characteristically, these areas are isolated and comparatively not well developed. Several rural societies and their schools are deprived. There is a lack of basic infrastructure for sanitation, water, roads and transportation, electricity and information and communication technology. Learners at schools in rural areas are disadvantaged by the social and economic issues of these areas place (du Plessis, 2014:1109).

2.3 THE SOUTH AFRICAN CURRICULUM

The South African school curriculum has gone through some changes, especially after 1994, to ensure that it aligns with the democratic principles that are pronounced in the country's constitution. The country comes from a past in which apartheid education was used as a tool for racial division of society and provided quality education to only a small part of the population. Education under this regime had schools that were divided according to race and this further reinforced the inequalities of divisions in society (Msila, 2007:146). The curriculum under this education system was also structured in a way that supported the divisions.

Transformation as a result education is believed to be attainable by means of the structure of the school curriculum and the successful execution of that curriculum. In Africa, there is a need for the development of curricula that is meaningful and relevant (Nhalevilo, 2013), such is the case in South Africa too. A change in the educational system in South Africa in the early 1990s was intended to remodel the old apartheid system. This has brought about the Revised National Curriculum Statement (RNCS) presented in post-apartheid South Africa. The RNCS is mainly interested in the introduction of education that is democratic in the country's schools. The goals of the reformed educational system are to produce a new identity for the country that incorporates critical consciousness, it is to alter the country's society by encouraging democracy and to expand learner participation in education (Msila, 2007:151). This system is based on the Constitution of South Africa, Law 108 of 1996 and forms the basis of South Africa's curriculum redesign.

Education and the curriculum play an important role in achieving the goal of maximizing the potential of learners as democratic South African citizens (DoE 2002: 1). RNCS sees education as a means by which South Africa's constitutional values: democracy, social justice, racism, equality and reconciliation can be achieved. The main purpose of the current education system is to enable learners to achieve effective citizenship and personal enrichment. (Msila, 2007:146). In South Africa the Curriculum and Assessment Policy Statement (CAPS) developed by the DBE (2011) explicitly states that IK must be included into the curriculum. This shows that in South Africa,

one of the ways in which the value of IKS can be stated, is through the curriculum. Through the reform of the South African curriculum, room has been made for the incorporation of IKS. It is now a matter of work to be done by researchers, policy developers and educators, IKS knowledge holders, curriculum developers etc to ensure that the curriculum is aligned with this goal.

Educational and curriculum reform and transformation have been a priority since after Apartheid ended in 1994. Education is essential as a means of rectifying the injustices of the apartheid regime that has created an unjust and unequal educational system. There have been notable changes in education post-apartheid, starting with the introduction of Curriculum 2005, also referred to as the 'Outcomes- Based Education (OBE) curriculum'. It has been suggested by Harden, Crosby and Davis (1999:8) an outcome-based education system can be generally described as results-oriented thinking. Ministry of Education in South Africa launched the OBE system in the year 1997. The National Curriculum Statement 2002 (NCS) was introduced due to some challenges that were experienced with OBE. It was a requirement by the NCS curricula that all learners in grades 10, 11 and 12 do a minimum of 7 subjects, as opposed to the 6 subjects being the case in OBE. In this system, a requirement is that learners must take a minimum of two South African languages and have to choose between Mathematics and Mathematical Literacy. It is also compulsory to do Life Orientation.

In 2000, there was a need to review the way the curriculum was progressing, especially whether it was effective in meeting the country's needs. A Ministerial Committee was appointed to conduct the review (DoE, 2002). The review covered areas such as the curriculum structure and design, teacher orientation. It also looked at training and development, learner support material and support for teachers with regards to implementation and timelines. These recommendations from the committee included the streamlining and modifying of the curriculum so that it could be more manageable to the educators. These recommendations were put into effect in the NCS 2002, to the Revised National Curriculum Statement (RNCS). Maphalala (2006:66) also contends that an absence of preparation among educators was one of the challenges in effectively executing the NCS curricula. CAPS was presented in the year 2012, following the RNCS. NCS and CAPS have similar motivations in terms of adapting the

curriculum to the goals of the country's constitution, they speak to the same values of social justice, human rights, being conscious of the environment, respecting people who are of diverse cultural, religious and ethnic backgrounds (Gumede & Biyase, 2018: 70).

2.4 BENEFITS OF INCORPORATING AIKS INTO THE CURRICULUM

There are benefits that can be derived from incorporating AIKS into the school curriculum. This has the potential of addressing and redressing social injustices especially in nations that have been previously colonised. According to Gumbo (2016) the curriculum encompasses knowledge that is put together, which should take into account indigenous viewpoints in order to have benefits for the indigenous learners and other ideas across the cultural realities of a particular community. One can already note the value that is being placed on IKS specifically in the field of formal education, this can be seen from the studies done by researchers in this field. Indigenous peoples' knowledge has produced capacities and skills that have helped humanity to survive for thousands of years (Hewson, 2015: 14). Hence, for Msila (2009: 313), the expression of IKS in a formal educational context provides an opportunity for an inclusive educational approach.

De Beer and Whitelock (2009:210) assert that including IK in science education can recognise the learner's social identity, turn learning into a positive experience and change the learner's attitude towards science. Culturally, the African Renaissance is closely associated with IK re-validation (Letsekha, 2013:12). Regardless of the form of IK, for Semali and Kincheloe (1999), it can have a significant impact on the educational and learning situation of a learner, as this knowledge comes directly from the child's actual living experiences. Its inclusion into the work done at school can aid in motivating students as they begin to see that acknowledgement is given to how they live in their communities.

The inclusion of IKS in education has been seen as one of the tools that can be used to achieve social justice and sustainable development. Currently, mainly due to the consequences of apartheid, the focus is on the social justice framework for education and training related to empowerment, investment in people and lifelong learning in the

country. (Avis, Bloomer, Esland, Gleeson, & Hodgkinson, 1996:9). IK has the potential to build the adaptability of people for climate resilient communities in Africa, this emphasises the usefulness of IK in the African school curriculum and the urgent need for its stimulation and use (Eten, 2015:116). As stated by Mr Mangena in the foreword of the Indigenous Knowledge Systems Policy, emphasising how IKS can improve the livelihoods of people.

‘The publication of the IKS Policy represents an important achievement in terms of engaging IKS in the drive to eradicate poverty. Whilst many intervention projects are involved in that noble cause, the IKS Policy provides a basis upon which indigenous knowledge can be used to make more appropriate interventions. We have great expectations that the adoption of this policy will lead to substantial improvements in the lives of many citizens and their living conditions. So, it is extremely important that the Department of Science and Technology, together with other government departments and stakeholders, move forward firmly towards the implementation of the policy and all its provisions.’ (DST, 2004:3)

The incorporation of AIKS in the curriculum has the potential to decolonise African Educational Systems. A criticism of the ideological basis of African education is that which sees neo-colonial cultural dependency as a threat to African intellectual autonomy (Mazrui, 1978: 13). Preservation of knowledge is also one of the benefits that can be derived from the incorporation of AIKS into the school curriculum (The United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2003: 17) states that languages of the local people can be used for preserving, conveying and applying traditional knowledge in schools:

‘A bilingual or multilingual education allows the full participation of all learners; it gives learners the opportunity to confront, in the positive sense, the knowledge of their community with knowledge from elsewhere.’ (UNESCO, 2003:17)

Another benefit is that AIKS can promote innovative thinking in both the teachers and learners. Learners are given the opportunity to gain comprehension from their personal experience, an understanding of the local situation and an abstraction of knowledge that they have already gained from their own communities. (Mawere, 2015:61). This allows for creative thinking in coming up with problem-solving strategies. For example, in Jigawa, Nigeria, young Nigerians invented a natural refrigeration system that does not run on energy resources such as electricity, gas, or paraffin. In addition, it is believed that three-quarters of Jigawa's people have been using the system, which helps farmers keep fresh food longer and limit the movement of people from rural areas to cities. This emphasises the view that indigenous people's education is practical and related to the needs of society. The system was designed in 1995 by Mohammed Bah Abba. It is also referred to as the Pot-in Pot cooling system, it has benefits for farmers such as limiting waste and helping them avoid spoilage of food. This in turn translates to increased income and reducing the health dangers of decaying foods.

Using fridges made from clay has been done since ancient times however at some point this system was forgotten. Mohammed brought back the old technology of clay fridges to create the fridge system, by using an old local understanding of the cooling properties of evaporating water, combining that understanding with the old practice of creating clay pots, used the knowledge to come up with this creation (Crossroads Global Hand Organisation,n.d). Mawere argues that Mohammed's invention of the Potin-Pot system may be the result of the abstraction of his understanding of the refrigerator put together with his home experience (Mawere, 2014).

Through the inclusion of IK into the curriculum, learners will have the chance to make comparisons of various types of knowledge for their betterment and that of their societies. This develops critical thinking amongst learners. IK represents an important part of 'global knowledge'. For example, several communities have taught their people on issues related to beliefs and practices that are about plant growth, nutrition, matters of pregnancies and taking care of children, how to prepare and preserve food, medicine, animal husbandry among others. These areas are also part of science and agricultural teaching school in science and agriculture (Mawere, 2015:62). Having IK

alongside conventional science in the curriculum, means learners can be empowered to view IKS in a positive light.

Many learners are sometimes demotivated to attend school when they perceive the education as something foreign which cannot be applied in their lives. Attaching what they learn in the classroom to experience from their actual lives, can be achieved by including AIKS in the curriculum. This can motivate learners to enjoy more of their schooling, by being able to identify with the contents of the curriculum.

One very important potential benefit of incorporating AIKS into the curriculum especially at the Basic Education level is that it is an opportunity to instil a sense of self-awareness and cultural pride amongst learners. IK can also be utilised to teach language, relate history, restore humanity and dignity and foster a sense of self-awareness and cultural identity for learners (Mawere, 2015: 63). As Busia (1964: 31) reports, Africans had high expectations pre- and post-independence that “education should be rooted in Africa’s own cultural heritage and values and have relevance to African societies”. In this regard, it was Busia’s feeling that maintaining African schools could preserve and communicate this African culture. Through the study of AIKS, learners can have an appreciation of the home languages, their identity and know understand their ancestor’s insight and involvement in knowledge and technological advancement.

The teaching of IK such as indigenous games, can help young people in terms of being creative, in can instil a sense of moral awareness and can foster innovation. Learning this knowledge can also result in the appreciation by young people of the contribution of the knowledge holders’ creative genius and indigenous philosophies in the areas of language, games and physical education. The inclusion of indigenous games into learning and teaching in the classroom may be a great asset in the development of self-confidence, identity and in achieving active participation, healthy living and higher academic achievement of indigenous children in most school subjects especially Mathematics and Physical Education. For example, a game called Amagende (isiZulu), mostly played by two opponents against each other, develops many skills such as hand–eye coordination, concentration, balancing, measurement, counting,

accuracy, cooperation, observation and competitiveness. The game develops children's mental strengths and facilitates their thinking processes (Mweli, 2018: 105). Nkopodi and Mosimege (2009: 378) indicate that the indigenous game Morabaraba has shown that it could be successfully used for teaching and learning mathematics. They said that using indigenous games in mathematics lessons in general gives learners the opportunity to relate their out-of-class experiences to concepts and the processes they encounter in the classroom (Nkopodi & Mosimege, 2009: 378).

The promotion of information sharing and diversification can be achieved through the incorporation of AIKS in the school curriculum and also lead to a better understanding of people's different lived experiences thus resulting in more tolerance. This is one important benefit that may be realised through the inclusion of AIKS in formal education. This is so that people with different cultural backgrounds can share and interact with IK from other cultures and evaluate them and imitate them as needed. A good example of this knowledge sharing is the Wasamba tribe in the Usambara Mountains of Tanzania. They have established a land-use system that mimics the pinnacle vegetation of deciduous forests through multi-story cultivation and integrates annual and perennial plants into the same plot. The principle of this practice was transferred to Nyabisindu in Rwanda, to be used in their project (Mawere, 2015:65). As the World Bank's World Development Report 1998/99 emphasises, the most important element to sustainable socio-economic development is knowledge, not capital. The basic elements of any country's knowledge system are the first steps in mobilising this capital. Sharing IK like the ones above may not only improve the cultural aspects of development but can also help reduce poverty (The World Bank, 1998). There is no doubt that there are several benefits that can be realised from the incorporation of AIKS in the school curriculum, all of these can lead to integrated education that fosters associations, inter-group understanding and cooperation.

2.5 CHALLENGES FOR AIKS

This section reviews the challenges faced in the incorporation of AIKS into the curriculum focusing on ethnicisation and epistemological issues. It also discusses the impact and after-effects of colonialism and post-colonialism as well as the restoration and protection of AIKS.

2.5.1 The impact of colonialism and post-colonialism after-effects

Colonialism has had long-lasting negative effects on the African continent. During the colonial era, colonial forces used policies and procedures to overcome the people of Africa to take complete authority of their land and resources. These policies involved constant belittling and subjugation of indigenous cultures and in some cases efforts to eradicate existing knowledge systems and replace them with Western beliefs and knowledge systems were implemented. These premeditated policies were successful in bringing about the total submission of the communities and creating stigma directed at their knowledge systems, as a result, the colonised African nations were stuck in the strategy of continuing their own conquest through western education, religion and deterioration of relatively self-sufficient economies into being dependent consumers to the Western system (Progler, 1999: 1; Eyong, 2007: 131). The idea of incorporating AIKS into the curriculum has been met with some resistance, this has been mainly associated with some of the perceptions that are held about AIKS. This section looks at some of challenges that these systems face, which have made it hard to get consensus on the inclusion of AIKS into the formal education curricula.

2.5.2 Challenges for the incorporation of AIKS

The challenges of incorporating AIKS into educational curricula can be grouped into themes which include Ethnicisation, Epistemological challenges, which look at conceptual and methodological issues, as well as matters of restoring and protection of AIKS. These are discussed in this subsection.

2.5.2.1 AIKS: *Ethnicisation*

Ethnicity was not necessarily a historically identified or socially generated pattern of identity. With regard to Africa, historians and anthropologists also agree that prior to colonialism Africa was "not composed of tribes and ethnic groups with different borders" (Lentz, 1995: 319). Existing societies were characterised by "mobility, overlapping networks, multiple group membership and flexible, context-dependent

drawing of boundaries" (ibid). The concept of "individual" identity with collective corresponding components such as the culture and language of different groups was consciously introduced only under European colonial rule in Africa with the separation of groups into specific areas. Policies and organisational institutions were used to implement this type of system, which is characterised by the divide and rule system (ibid), this resulted in the political borders of African countries being developed. The result of this, is that knowledge is claimed by different ethnicities, making it hard to distinguish who owns the knowledge as well as having many knowledge systems forming part of AIKS.

Similarly, it can also be hard to distinguish who owns knowledge because the same knowledge may be claimed by different countries. For instance, Mosimege and Holtman (2012:29) share an example of the Hoodia cactus that has been of significant interest in debates relating to IKS in South Africa including Southern African countries such as Botswana, Namibia and Angola and put forward the issues involving IKS and the matter of proper sharing of benefits with the knowledge holders. Maharaj, Senabeand Horak (2008) suggest that Hoodia shows the potential for bioprospecting to bring significant economic and social benefits to the country. The case also underscores the importance of national cooperation in protecting IK (Mosimege & Holtman, 2012: 29). The issue of ownership becomes very important in matters of benefits derived from IK. At a meeting of the Regional Sun Heritage and Culture Commission (RSH & CC) in June 2001, Hoodia was found to have been collected and used for generations by communities and San healers in Angola, South Africa, Namibia and Botswana. (Mukuka, 2010: 50). Interestingly, an aspect seldom mentioned in this discussion is that of the use of Hoodia by other groups such as Northern Sotho, Tswana and Venda-speaking ethnicities (Van Wyk & Gericke, 2000: 70). Another example is that of the knowledge of the African Potato's (Hypoxis) medicinal properties, of which multiple ethnicities may have claim over. There is some evidence suggesting that the Khoisan used seasonal hypoxis long before the Bantu speaking groups arrived in South Africa. The Afrikaner group have been known historically to coexist with other groups in South Africa, for example, the Kalahari Desert Sans, Tswana and Si-Pedi-speaking people. As a result, by the late 1960s, there is the possibility that the knowledge of the healing properties of Hypoxis was

widespread (Russell, 2009). There is not however sufficient evidence to support this claim and thus there are always difficulties as to who is considered to be indigenous to South Africa (Mukuka, 2010:66). Such issues create challenges for IKS especially in determining ownership of the knowledge.

2.5.2.2 *Challenge of epistemology, conceptualisation and methodological issues*

In the African context, IK is seen as holistic, in the sense that some IK is based on African spirituality and cannot necessarily be explained through conventional scientific methods. According to Horsthemke (2004: 31), since the IK mainly rests on the spiritual and mental perceptions with no empirical proof, it is asserted by critics of AIKS that it is, “a knowledge that involves incomplete or at worst a questionable understanding or conception of knowledge”. This has created debates about the question of whether IKS is valid and thus also its inclusion in the Curriculum. The Science and Technology Portfolio Committee (2004) emphasised that verification of IK should be looked at as a process that is two-way. IK can be verified by other knowledge systems in the same way that it can validate other knowledge systems. Some IKS supporters argue that, unlike Western science, IKS needs to be authenticated and verified under its own conditions. The World Bank calls for the development of innovative practices for the verification of IK (The World Bank). The issues of the validation of IKS makes it difficult for its inclusion in the curriculum in South Africa since for some, it is not seen as ‘knowledge’ in the formal sense.

2.5.2.3 *Restoring and Protecting AIKS*

One of the challenges in the use of IKS is that it can be subject to exploitation. This has been raised as an issue in the literature with examples made in the health and agriculture industries. There are examples that show the most interest generated in IK come from large Multinational Pharmaceutical Corporations (MNPC's). Mukuka in his study titled ‘Indigenous Knowledge Systems and Intellectual Property Laws in South Africa’ provides an example of the African Potato noting that it is concerning that the founder of the pharmaceutical company, Liebenberg, currently holds a patent on a product retailed as "Moducare Sterinols." This product contains sterols and sterolins

from the African Potato. This includes treatment that Liebenberg received from a neighbour whose knowledge was informed by the indigenous community (2010:63).

In efforts to deal with issues of exploitation and protection in South Africa, there is for example, The National Environmental Management: Biodiversity Act. No. 10 of 2004. This Act provides for:

‘The management and conservation of South Africa’s biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant protection; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith’.

The Act provides clarity on how IK systems are protected from exploitation which is one of the big challenges. The South Africa’s National Environmental Management Biodiversity Act explicitly makes bio-prospecting activities illegal if there is no Prior Informed Consent (PIC) and the activities are outlawed if there is no compliance with the Material Transfer Agreement (MTA) and an Access Benefit Sharing agreement (ABS) requirements. The Act states that there must be provision “for a fair and equitable sharing by stakeholders in benefits arising from bio-prospecting involving indigenous biological resources” (Section 80 [1])

‘As Van Wyk has indicated, the plant has been used by traditional healers for centuries in southern Africa (2000:146). Liebenberg however, stated that he got the mixture from a neighbour but did not get PIC, MTA and offer ABS after he discovered the medicinal value of the plant. Instead, he misappropriated the economic benefits and kept all the profits for himself at the expense of the ‘other’, that is, the indigenous communities, the custodians of the knowledge.’ (Mukuka, 2010:66)

The exploitation of IK specifically in reference to medicinal plants and the genetic resources they harbour has increased due to developments in biotechnology. The use

of this knowledge by the global healthcare industry is still evident in MNPC in their drive, competing to find the cure for all modern illnesses. The central question is who will reap the benefits from this abuse. Some argue that the benefits to the indigenous communities who hold the IK knowledge are insignificant (Shiva, 1997). The IK holders are at a disadvantage both economically and socially and are not protected, this in turn, means the country is at a disadvantage if there is no protection of these resources and knowledge. The big contributors to the economy in South Africa are the pharmaceutical and agricultural industries and with no protection of IK, the local communities and the country as a whole will be at a loss. Even though foreign sources pose a large threat, it is unfortunate that the theft of IK also occurs nationally by companies that are local and research institutes (Department of Trade and Industry [DTI] 2008: 6).

South Africa has the IKS Policy (2004), which resulted from efforts of different departments that sought to develop a guide that will inform the recognition, understanding, integration and promotion of the country's wealth of IK resources. The Protection of Indigenous Knowledge through the Intellectual Property System policy framework by the DTI described how the South African intellectual property system which includes matters such as trademarks, geographical indications, patents, designs and copyright can be utilised to protect IKS. As a country, a case can be made economically to rationalise why a need to commercialise and protect IKS is there. (DTI, 2008:3).

We cannot conclude about the challenge of protection of the indigenous resources and importantly, so the IK linked with without mentioning the issue of the "legalised" piracy which is certified, permitted and undertaken by national and international companies and their associate research institutions. It is however unfortunate that at times, that piracy of IK and resources is protected by bilateral agreements between some African governments and global business under the false guise of developmental programmes (Moahi, 2007: 5). Cultural globalisation is also contributing to the destruction and ensuing erasure of AIKS as there is a tendency to look down upon knowledge that is not documented.

The above-mentioned challenges make it hard for policy makers to come up with recommendations on the inclusion of AIKS in the curriculum. When developing curricula that is inclusive, it is important to take into consideration that there many ethnic groups in South Africa and therefore it might not be easy to select which AIKS must be included. Also matters of protection of knowledge and acknowledging the knowledge holders are some of the challenges that must be addressed.

2.6 WAYS OF PRESERVING AIKS

The literature identifies several ways that AIKS can be preserved. These ways and methods are discussed in this section.

2.6.1 The role of libraries

Libraries can play a huge role in preserving AIKS. Libraries can create institutional data centres to store the acquired AIKS. They need to encourage communities to document and publish their own IK. For example, in the Ulwazi project in Durban, South Africa, people in the community are helping to create and populate the database (The Herald, 2016).

Academic libraries are also mandated to preserve the research output of educational institutions. Researchers and library personnel should work together in higher institutions to conduct research in IK and then placing the research outputs in institutional repositories so that it is documented and preserved (The Herald, 2016). Taking into consideration that where students in higher degrees like Masters or PhD complete their studies, their research becomes part of institutional repositories ready to be incorporated in curricula, such collaborations would prove fruitful.

2.6.2 IKS Centres

IKS centres also play a critical role in the preservation of IKS. This subsection looks at such centres from a South African and African perspective.

2.6.2.1 IKS Centres in South Africa

The availability of IKS Centres in various places is important as it contributes to the preservation of the knowledge. In South Africa, Indigenous Knowledge Systems Documentation Centres (IKSDCs) in provinces are essential in making sure that IK is preserved and also for the management and ensuring access to the knowledge. IKSDCs are set up at the local level as a means of recording IK resources in different communities. For instance, the office of the Free State IKSDC supported by the National Indigenous Knowledge Systems Office (NIKSO) of the Department of Science and Technology (DST) is situated in the Centre for Gender and Africa Studies (CAS) at the University of Free State (UFS) and has been active since 15 April 2013. The Free State IKSDC began its pilot project in Thaba Nchu comprised 42 villages. In this community, a steering committee was created, a team recruited, IK holders identified, documented and recorded through the various challenges and highlights.

Another example of such is the KwaZulu-Natal's IKSDC situated at the University of KwaZulu-Natal (UKZN), which is a response to the broader IK systems policy. It is an initiative of the Department of Science and Innovation (DSI) which was known previously as the Department of Science and Technology in collaboration with UKZN. The aim of this initiative is to encourage IK holders to document IK so that it can be adequately protected, and the information disseminated. The broader project hopes to ensure that the knowledge of the country will not be exploited, will be available for future generations, people will get ownership of their IK and will have future economic benefits. Most importantly, it will stimulate the younger generation to use IK. The information is stored in the National Recordal System (NRS) which was established for the purpose of recognising, developing, promoting and protecting IK data. The NRS is a large initiative of the DSI, which aims to document, record and store IK for the benefit of the communities of South Africa. It takes into consideration the recording of unrecorded IK in various multimedia formats and aims to promote community IK (Department of Science and Technology, 2013).

One other example of such centres is the Kara Heritage Institute. The Kara Heritage Institute specialises in IKS that is particular to South Africa. One of Kara's goals is to document the knowledge that has been verbally passed down from one generation to

another until recently, but its main goal is to create sustainability through skills development. To achieve this aim, the Institute runs a number of programmes, including the Kara Heritage School that specialises in African history and IKS, life skills and entrepreneurial development. The Kara Heritage Villages are self-sufficient communities with pre-schools, libraries and educare centres. The villages also house sewing centres and other entrepreneurial training programmes and play a fundamental role in strengthening African heritage (Kara Heritage Institute, 2019).

2.6.2.2 IKS Centres in Africa

Similar centres with the purpose of preserving IKS exist across the African continent. In Ghana there is the Centre for Indigenous Knowledge Systems (CEFIKS) dedicated to the inclusion of IKS in Africa. It is a non-profit and non-governmental association situated in Accra. CEFIKS has a branch office in the United States and is working to integrate IKS in Africa, especially Ghana, into the fast-growing Information and Communication Technologies (ICT) movement. It is also to allow underprivileged communities in rural and urban areas to access and use both indigenous and coming up ICTs. It is also promoting the use of IKS and other kinds of information to build the capacity to accelerate socio-economic advancement areas of Ghana and throughout West Africa (CEFIKS).

In Murehwa, Zimbabwe, there is for example, the Murehwa Culture Centre, established to make use and get to know the IK of the communities that surround the area. Kenya has the Kenya Resource Centre for Indigenous-Knowledge (KENRIK), Established in 1992, under the East African Herbarium (EAH), a continuation of the Indigenous Food Plant Program (IFPP) project aimed at disseminating information about wild edible plants collected at EAH for over 90 years. KENRIK is now documenting, preserving and disseminating IK as part of its cultural heritage. The centre's research interests are traditional edible plants, indigenous medicinal plants, sacred sites, ecological knowledge systems and building structure architecture.

KENRIK's accomplishments include conducting research and documentation of traditional medicine and medicinal plants, registering and documentation of traditional food plants and related IK as well as recipes and promotion of their use. In Kenya, a

book on edible plants from there has been published. There has also been the documentation of sacred locations including ethnobotany, related IK and conservation status quo and imminent threats. KENRIK also provides technical support in the development policies of policies for mainstreaming IKS (Center for Biodiversity).

Nigeria's African Resource Centre for Indigenous Knowledge (ARCIK) is engaged in interdisciplinary research and documentation of IKS activities in Africa. ARCIK deals with the retrieval, storage and distribution of information about IKS in the socioeconomic, political, cultural and technological life of African communities. The Centre provides sources of support to researchers in the field of IK. In addition, it organises and promotes IK research by all Nigerian Institute of Social and Economic Research (NISER) staff and by other academics in Nigeria and Africa. In addition, the centre organises conferences, seminars, workshops and symposia on numerous aspects of AIKS and Nigerian IKS (Wiser Directory). The Centre for Scientific Research, Indigenous Knowledge and Innovation (CesrIKi) in Botswana is an interdisciplinary and research centre focussed on science, which embraces the basic and applied sciences of IK. The centre is involved in Research, Documentation, Education and Awareness, as well as development efforts in Health, Food systems, Agriculture and Environmental management. The centre pays special attention to the development of participatory research approaches which establish close links with communities (University of Botswana, 2020).

2.7 INCORPORATION OF AIKS INTO THE EDUCATION CURRICULUM

Having AIKS as part of the school curriculum is a valuable tool for social justice, decolonisation of the curriculum as well as to impart this knowledge to ensure that it is not lost. Institutionalised education founded on Western liberal values has influenced both individual freedom and respect for the wisdom of the elders. It downplays the role of families and communities in the education of students at all levels. The marginalisation of AIKS, together with family and community nuclearisation, in formal education with a standardised Western education curriculum, focuses on individual success in a broader consumer culture than on his own environment and ability to

survive in that environment. From a Western point of view, centralised management of learning is in line with the principles of freedom and democracy (Matike, 2008).

Integrating AIKS at all education levels will result in benefits for students, since it will make education more relevant and effective, providing students with an education that reflects their experiences, unique viewpoints, language and customs. By incorporating and linking IK and modern knowledge systems into the curriculum from an educational content perspective, learning material help prepare students for the greater world (Kante, 2004). As noted by Kaya and Seleti (2013: 37):

‘African students and educators share the opportunity to re-evaluate the inherent hierarchy of knowledge systems. This is because AIKS were historically denigrated by colonialism and other forms of imperialism. Therefore, their inclusion in the formal education system will enable them to recognise and acknowledge the existence of multiple forms of knowledge rather than one, standard, benchmark system based of western values and ways of knowing.’

This emphasises the benefits and importance of AIKS in the restoration of African knowledge forms and values.

2.7.1 IKS Research at school level

There are examples in South Africa of schools that are already attempting to implement the IKS policy which promotes inclusion IK in the curriculum. For instance, McKnight (2015: v) conducted research on the topic at high school level. The case study, which was qualitative, of three Life Sciences teachers aimed to explore teachers’ experiences of IKS found in the Life Sciences curriculum at a high school in South Africa. The findings of the research were that teachers have shown positive attitudes towards IKS, shaped by their understanding of the nature of science and IKS, but this positive attitude is not fully reflected in their practices in the classroom. Their teaching in the classroom shows an approach to the curriculum based on performance, which informs content, activities, assessment, the grouping of learners

and time. There was also a revelation in some instances of a lack of understanding of certain curriculum issues. It was discovered that there is a misalignment between the intended and implemented curriculum (McKnight, 2015:126)

Jacobs (2015: 165) did research titled 'The Classroom Implementation of IK in the Science Curriculum by Science Teachers in the Western Cape Province, South Africa'. The purpose of the study was to investigate whether there was an integration scientific knowledge and IK by teachers as required by the RNCS (DoE, 2002) within the chosen classrooms of the Western Cape Province. Some of the findings in the study by Jacobs is that teachers are not implementing IKS in the classroom. Teachers had several reasons why implementing the integration of IK in the science curriculum as required by the Department of Education did not or could not happen. It is further highlighted in the study that the question that should be asked is whether the teachers are supported in integrating the science and IK in the classroom (Jacobs, 2015: 174). This study will also look into some of these issues raised by Jacobs in his research to draw relevant conclusions and make appropriate recommendations.

Other research includes that by Khupe (2014: 199) who conducted a study in a rural community called Mqatsheni, in which there were requests from the community to have a curriculum that is community-based, education which is culturally relevant with teaching and learning that focuses on the learner, all of which are within current trends in science education. The study showed that the community wishes for school science to be associated with the local environment; involving greater interaction between the school and the community; be based on collective science teaching and learning that is respectful. The findings were that these ideas would need to be reinforced by further study, mainly through collaborations between the school and community in the formulation and piloting of appropriate and relevant curriculum materials.

Another study was done in Namibia, which also looks at the issue of the incorporation of IKS in learning. The research 'IK and Environmental Education: A case study of selected schools in Namibia' aimed to find out how IK can be used to support Environmental Education in Namibia's rural schools (Sheya, 2014: 4). Globally, there are examples from which South Africa can learn how IKS can be incorporated into teaching at schools. For instance, the Alaskan model of Indigenous Education offers

an example of how to integrate IKS with modern science to provide useful education to the community while leveraging community insights and new knowledge of the laws of nature and the complexity of the material world discovered by science (Masemula, 2013: 94). This model shares ways on how to develop further models for the integration of the two knowledge systems.

2.7.2 IKS research at tertiary level

Even at the tertiary education level, there is a move to incorporate IKS into the education system. For example, in 2001, work began on the development and integration of IKS into a curriculum for undergraduate and postgraduate level research, learning and engaging with the community at North-West University. The institutional, national, continental and global goals provided the motivation for integrating IKS into the central business of the institution, which include research, teaching, learning and community engagement (Kaya and Seleti, 2013: 39). It was in line with the vision and missions of the institution, the aspirations of the National IKS Policy (2004) and the New Partnership for Africa's Development (NEPAD).

A study conducted by Mmola (2010) on "Students' and Lecturers' Perceptions Towards the IKS Programme at the North-West University" showed that more than 80% of the respondent students had the opinion that lecturers who incorporated indigenous African cultural elements, especially the use of the local language, that is, Setswana, into their teaching practices were highly appreciated by students. They also indicated that such lecturers made them experience a feeling of autonomy by getting the opportunity to learn university education using their own language. Interviews with both respondent students and lecturers revealed that the lecturers who used Setswana in their teaching and interaction with students, incorporated local community practices into lessons, utilised culturally relevant material, were very much appreciated by students (Kaya & Seleti, 2013: 39).

The University of the Free State developed an Integrated Transformation Plan (ITP) which amongst other areas initiates a curriculum review intended to probe the marginalisation of certain identities and philosophies of knowledge, incorporating knowledge from Africa and the global South (UFS, 2017: 2). Importantly, the university believes that IKS signify an important element of global knowledge when it comes to development issues. The Department of Pharmacology is particularly focused on the integration of IKS with the pharmacology of medicinal plants. Plant Sciences researchers on the UFS Qwaqwa Campus in the Eastern Free State are also contributing to the growth of IKS with their work on the antibiotic, antioxidant and antidiabetic working of local indigenous plant species. This is just one of the examples of the work that is being done by the university on IKS.

Other universities which have put IKS in the forefront of education is the University of Venda (UNIVEN) and University of KwaZulu-Natal (UKZN). Both universities offer qualifications in IKS at their institutions. The Department of Indigenous Knowledge Systems and heritage studies at UNIVEN hosts the Bachelor of Indigenous Knowledge Systems (BIKS) which is a four-year professional degree. BIKS is inter-disciplinary, intra-disciplinary and multi-disciplinary, making it unique and relevant to the University's strategic plan in the current discourse of African Renaissance, decolonization, transformation, and cultural diversity. The BIKS is categorised into four streams namely, Health, Agriculture, Science and Technology (Innovation), and Arts and Culture (University of Venda). The UKZN Extended Learning branch offers a Certificate in Intellectual Property and Indigenous Knowledge Systems which is aimed at creating awareness among participants on the importance of protecting indigenous knowledge systems for equitable benefit sharing with indigenous knowledge producers (University of KwaZulu-Natal).

2.8 USING AIKS TO DECOLONISE THE CURRICULUM

Decolonisation has been one of the contentious topics within the education spectrum. In South Africa this has been witnessed during the 'FeesMustFall' Protests, where there were calls for decolonisation of education. In this regard, IKS has been identified as one of the tools that can be utilised to achieve this goal. AIK has been around since

before colonialism and has over time evolved into modern forms (Hewson, 2015:41). It has been argued that as an alternative to solving social problems, it is highly necessary to leverage the richness of local IKS and integrate it into the curriculum of formal education (Msila, 2007:155). Van Niekert suggests that in recent years, there have been many initiatives to democratise curriculum development, with everyone interested in this process getting involved.

'This approach is called the socio-constructivist perspective, where a curriculum is the result of negotiation. It is hoped that curricula that are developed in this way will serve the needs and aspirations of particular communities of learners. Curricula have to be contextualised in order to address the problems, topics and issues that face a society' (2004:187).

Shizha notes that colonial school education has resulted in harmful effects such as the loss of indigenous voices, self-identities and self-confidence (2013:8). According to Shava, Africa's formal educational curricula are still characterised by the dominance of the Western knowledge system and there is no desire to express and apply local knowledge in formal education and socio-economic contexts (2016:122). The westernised modern education systems lack contextual relevance and the omission of the educational role of the local communities and their knowledge is one of the issues that sparked the need for decolonisation (Shava,2016).

The United Nations is also in support of the decolonisation of perpetual hegemonic Eurocentrism epistemology in the worldwide indigenous communities (Shizha, 2013:14). This has been followed, for example, by several demands for Africanisation of higher education, mainly understood as making sure that the subject matter and teaching methods are adapted and directed to the physical and cultural realities of the African environment (Letsekha, 2013:5). Seepe (2000) has argues that without IKS being considered, a radical reform of education in Africa which aligns education to African challenges will not be realised. For the people of South Africa, education needs to aid with the objective of social justice in order to address social challenges and community values and in designing the curriculum and building knowledge bases at universities and other higher institutions, culture and other social issues need to be

considered. IKS offers the opportunity to develop an inclusive approach to education (Msila, 2016:313). It is important that IK is recognised and valued at the level of the school curriculum and that it be incorporated into the teaching process.

‘When IK is integrated into the classrooms, students connect better to material taught. The knowledge can be used for their community’s sustainable development’ (World Bank, 2005).

One way to decolonise the African education system is by creating an educational space to regain and apply knowledge and learning practices in a formal education process and to develop a curriculum that responds to local circumstances (Shava, 2016:130). The inclusion of IKS to decolonise education is about reform. Education reforms in educational systems need to reach the community and come from the community to minimise resistance to implementation. (Changach & Muricho, 2013:134).

Johnston highlights the value of IKS by looking at it from the perspective of the ecotourism curriculum. IK is viewed as occupying a central position in the decolonised ecotourism curriculum and lecture room and can be used to eliminate exploitation, gender inequality, displacement and disrespect by students and foreign tourists (Johnston, 2000). All indigenous communities have wise men who have achieved "advanced knowledge and understanding of their culture's worldview" (New World Encyclopaedia, 2016) that protects the philosophy, history, culture, IK, etc. of the community by passing them on to the younger generation. The knowledge holders can be consulted and invited as co-curriculum developers, consultants, or guest lecturers. Ecotourism as a subject of study integrates areas such as global environmental matters, pro-poor tourism, sustainable tourism development, adventure and marine tourism, field guiding, IK, cultural tourism and more (Hlengwa, 2018:5).

There is a certain number of elements identified by Smith (1999) that need to be considered in order to decolonise the curriculum successfully. Included is the breaking down and rebuilding; self-determination and social justice; ethics, language and the internationalisation of indigenous experiences and history. Of particular importance for

this study are self-determination and social justice and internationalisation of indigenous experiences. Self-determination and social justice allow those that have been marginalised to seek validity for knowledge that is rooted in their own histories, experiences and ways of viewing reality (Smith,1999). IK can be made part of the school curriculum to teach African children about Ubuntu philosophy, moral and cultural beliefs. The use of indigenous games in the school curriculum is one way in which we can contribute to the current decolonisation discourse. According to Aypay, the learning of values within games is actualised in children's behaviours through role-playing and the embedded cultural messages within games that turn into permanent feelings, thoughts and behaviours that reflect common cultural interactions (2016:285).

In essence, decolonisation of the curriculum is about acknowledging the diversity of our country, whilst also focussing on achieving social justice for those groups whose knowledge has been previously marginalised.

2.9 THEORETICAL FRAMEWORK

The theme that can be deduced from the literature is the importance of IKS and its importance for playing a role in the education system of a country. We also see that IKS are a sum part of systems but they themselves are parts of other systems. This study is underpinned by systems theory. According to Von Bertalanffy (1974), a system is a set of subsystems or parts that are interconnected and interdependent to perform as a whole. A system's subsystem can be a system in itself. If one subsystem in the system functions more efficiently than the other, or if it ceases to function, this will affect the entire system, resulting in the whole system functioning less efficiently or not at all. For the system to work more efficiently, all subsystems in the system need to work in a coordinated way. This theory can help us understand how incorporating IK can also result in an efficient education system ensuring that IKS are protected, which can also result in sustainability as highlighted in much literature. Studies on IKS can also be underpinned by symbolic interactionism since these systems vary and humans place symbolic value on their interaction such as that with the land, plants, each other. Denzin (1995: 43) gives a list of seven core assumptions of symbolic interactionism:

- The actions of human beings towards things are based on the meanings that the things have for them.
- The process of social interaction give rise to the meaning of the things.
- Meaning changes through a process that is interpretive in which introspective individuals interact symbolically with each other.
- The worlds of experience in which human beings live is created by themselves.
- The meanings of the worlds of experience emanates from interactions, which are shaped by the self-introspection of people in their circumstances.
- This interaction with self is 'intertwined with interaction at a social level and impacts that social interaction. This means that symbolic interaction, the union of self and social interaction, is the main means by which human beings can form social or joint acts.
- These joint acts, their creation, termination, struggle and merger, make up what Blumer calls 'the social life of a human society. A society consists of joint or social acts 'which are formed and carried out by the members' (Blumer, 1981: 153).

2.10 CONCLUSION

The purpose of this chapter was to provide a literature review relating to IKS and AIKS and the curriculum in the South African context. This has been done by firstly ensuring that concepts that will be used throughout the study were clarified. Since the study is mainly on the incorporation of AIKS in the curriculum, a review of the curriculum as it has evolved in South Africa, was one of the important areas highlighted. This provided the background to some of the issues that curriculum reform in South Africa sought to address. With this background, identifying what the benefits and challenges would be for the inclusion of AIKS has thus also been addressed in this chapter. Some examples of incorporation of IKS are discussed, this has been done across all levels of education and across different areas within and out of the continent. Looking at these examples, is a way of giving us an idea of the viability of this exercise and presents us with some of the gaps that this study can potentially fill. In closing, the chapter discusses some

of the theoretical frameworks that support this study, providing us with a strong basis for undertaking this study and how in theory it may be viewed.

CHAPTER 3

INCORPORATION OF INDIGENOUS KNOWLEDGE SYSTEMS (IKS) IN THE EDUCATION CURRICULUM

3.1 INTRODUCTION

The chapter above provided a review of the literature as it relates to IKS. Part of the focus of the literature review was to highlight some of the research that has been conducted in the areas of IKS in education. This chapter expands on some of the areas that were highlighted, zooming in on the developments that have taken place in trying to incorporate IKS in the education curriculum. The following section will look at IKS and the education systems, using the Systems Theory to explain the concept of IKS, as part and in relation to the education system. The section also highlights some of the curriculum requirements for IKS in South Africa. The section that follows, touches on the theory of Symbolic Interactionism, to demonstrate its application as it relates to this study. What follows is a review of how IKS is being implemented at school level and what considerations should be taken into account when trying to implement. In this section, examples are provided, considering the expectations and experiences from different role players. There have been some advances made in including IKS in the curriculum especially at tertiary level, these are discussed. The chapter will discuss some models that have been used to incorporate IKS in the curriculum, looking into their aspects and how they can be modified to be better suited for the South African context. Lastly, some of the implications to be considered when incorporating IKS in the curriculum are outlined, to show how certain role players and systems may be affected by the incorporation of IKS in the curriculum.

3.2 COMPLEX SYSTEMS: IKS AND THE EDUCATION SYSTEM

3.2.1 Understanding Indigenous knowledge Systems (IKS)

IKS is defined as a multifaceted set of developed knowledge, skills and technologies, it exists under certain conditions of people and communities who are indigenous residing in a particular area. It is made up of the knowledge that citizens in a specific community have over time established and continue to advance. It encompasses health care, education, environmental conservation, agriculture, food preparation and a vast range of other activities. IKS is rooted in community practices, interactions, rituals and institutions, (Centre for Indigenous Knowledge Systems, 2005:1)

According to the United Nations Educational, Scientific and Cultural Organisation (UNESCO) IK includes philosophies, skills and understandings, that indigenous groups who have extensive history of interacting with their natural settings have developed. Indigenous societies use local knowledge to make decisions about the basic aspects of everyday life. It further states that communities from all over the world hold a rich set of experiences, understanding and explanations. This knowledge is essential to a cultural complex that also integrates language, systems of classification, resource use practices, social interactions, ritual and spirituality (UNESCO, 2017).

3.2.2 Characteristics of IKSs

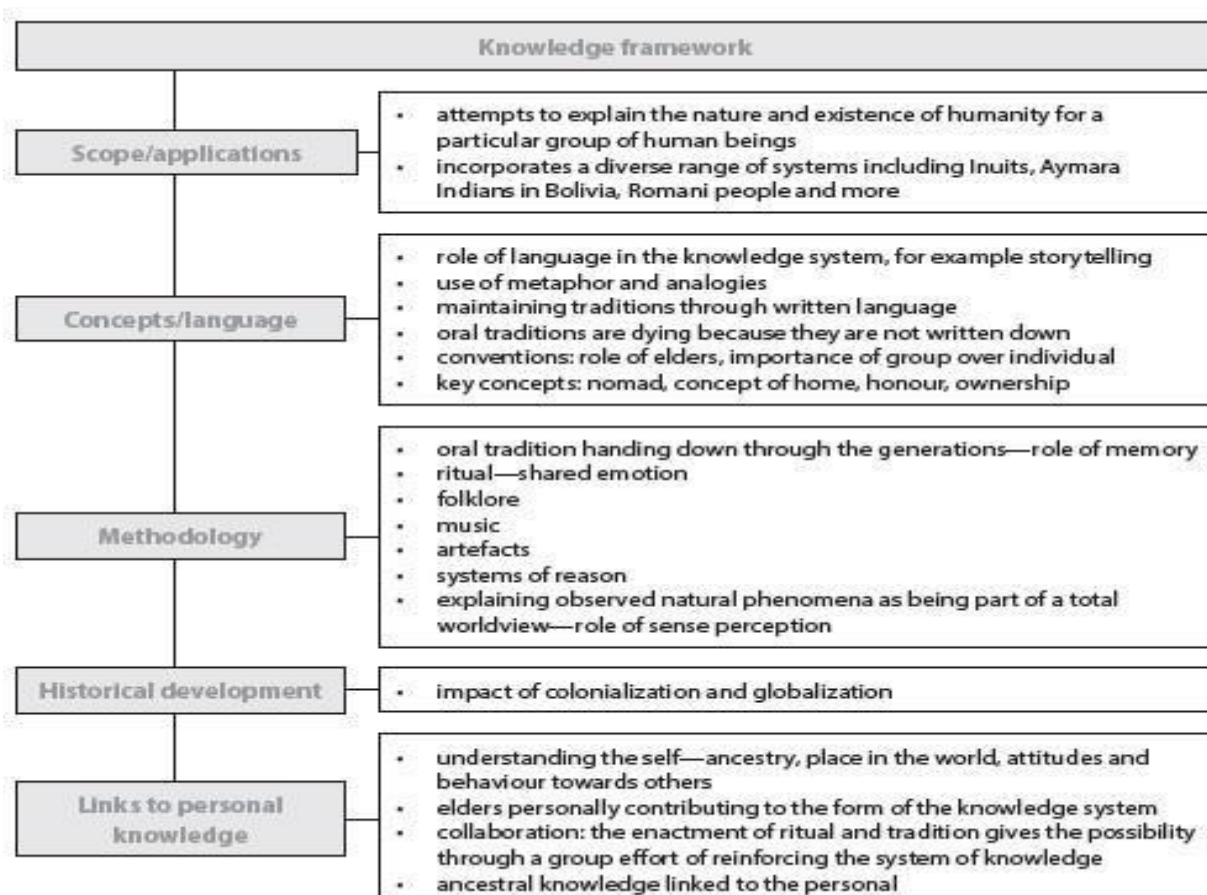
Ogbebor (2011) identified certain characteristics that distinguish IKS, these include:

- Local: The knowledge is rooted in a particular collection of experiences and created by the persons who reside in a specific area.
- Usually, the knowledge is orally conveyed or communicated by means of simulation and demonstration.
- IK is usually as a result of practical day to day life interaction and is strengthened continually by trial and error as well as experience.
- Typically shared to a larger extent more than other forms of knowledge, including global science. Sometimes referred to as the “people’s science”, a title which from the fact that the knowledge is generated in contexts of everyday creation. For example, in most cases it is unevenly disseminated within a

population, by gender and age and preserved through distribution in the memories of different individual. There can be specialists who get the title because of experience, some by virtue of having political or ritual authority.

- It puts a focus on specific individuals and may achieve a level of consistency in rituals and other symbolic concepts, its distribution does not exist in its totality or individual. To some degree it is devolved in practices and interactions in which people engage themselves and in the not individuals. (The Herald, 2015).

Diagram 1: IKS Knowledge Framework



Source: <http://casetok.weebly.com/iks.html>

The diagram is an example of the elements that explain the knowledge framework of IKS by the Theory of Knowledge (ToK) IB Diploma Programme Course at Case High School. The knowledge framework is a tool used to explore areas of knowledge, by identifying the main features of each area of knowledge, showing each area as a multifaceted system of five components acting together. This gives us the ability to

compare and contrast effectively different areas of knowledge and permits the opportunity of a deeper examination of the connection between areas of knowledge and different ways of knowing. It is imperative to study the means of communication, processes used to make decisions, thinking processes and the holistic view of knowledge when studying IKS. This framework is important for this study because it will provide a way of interpreting the knowledge and its significance in the context of the education system. For instance, knowing that IKS incorporates a diverse range of systems, means that for the study, it is important to explore what those systems are in Africa in order to even discuss which systems can be incorporated into the curriculum. that speaks to the element of scope and application of the knowledge. Concepts and methodology are also important consideration when discussing IKS and since in this study, the issue of having IKS in the curriculum is key, it would be very important to know how such knowledge is retained and also transmitted. For example, using IK games is one way that through literature we have deduced that IKS can be incorporated into the curriculum. the table also shows examples such as folklore and music.

In IKS multiple methods can be used to transmit knowledge, like in the case of some IKS games, you can have music, storytelling and artefact as part of a game. For this study, historical developments form an important part of exploring and describing the incorporation of IKS in the curriculum as with many African countries that have experiences of colonisation. Having a clear understanding of such historical developments creates an understanding of the context under which there is a need for the incorporation of IKS in the curriculum. Looking at IKS in a holistic view speaks to the element of the knowledge framework that links the knowledge to personal knowledge as indicated in the diagram.

3.2.3 IKS explained in the curriculum documents and through the lens of Systems Theory

The meanings of IKS have been explained in the curriculum statements in South Africa. The National Curriculum Statements (NCS) Physical Science for Grades 10 to 12 refers to IKS as a collection of knowledge rooted in African philosophical thinking and social practices that over of years have evolved. Whilst the NCS Life Sciences

Grades 10 to 12 refers to IKS as knowledge created by groups of people who have lived in an area over a long period of time (DoE, 2003b: 64). The Revised NCS for Natural Sciences explains IK to be

‘Indigenous or traditional technologies and practice in South Africa are not just ways of working; they are ways of knowing and thinking. Traditional technologies and practices often reflect the wisdom of people who lived a long time in one place and have a great deal of knowledge about their environment’ (DoE, 2002a: 10).

The word ‘system’ creates a picture of separate parts acting in conjunction. When utilised together with the words IK as shown in literature, the same connotative picture is brought on (Reynar, 1999). The environment consists of several social, economic and political institutions, which are inter-dependent and are constantly interacting. All components within an environment are a complete system on its own, it is a unit or subsystem of a larger system which is inter-dependent. The same can be said of the education system. The systems theory helps us understand, IKS and the education system, in relation to each other and also as it relates to the environmental system (whether political, social etc) (Oyebade: 38).

According to Schmuck (1977) schools are living systems that are always interacting with the communities within which they operate including institutions in them. The school system is seen as a robust, living organization and although it is a whole system by itself, it is a sub-system of the national education system which in turn subsists in the larger social supra system termed the environment. An organisation is ought to be studied not simply as a formal arrangement of superiors and juniors or as a social system where people are influenced by each other but as a total system in which the environment, the formal arrangement, the total systems and the technical and knowledge systems are interacting continuously (Dale, 1984). This leads us to better understand IKS for this study and how many factors and systems come into play when studying the incorporation thereof in the curriculum.

It has been mentioned how the political system of the country affected the education system and curriculum transformation and how IKS can be used as a knowledge system to achieve social justice within a social system. This shows the interconnectedness and interrelation of many systems at play. This study's theoretical framework is based on the systems theory, which is explained by Bridgen as an area of inquiry that one utilises in an attempt to understand the wholeness of scientific and social problems (2017:10).

Complexity presents different ways of looking at and thinking about organisational systems that have the capabilities of responding to and influencing complex nonlinear relationships such as IKS. Comprehending the local dynamics in a system that is complex can offer great perception into the behaviour of the complete system and assist in identifying key leverage points of transformation (Govender, 2012:113), therefore the theory is useful for this study. 'There needs to be coherence and flexibility within a system with a high level of cooperation, collaboration and communication, among its networks to ensure effectiveness' (Sanders & McCabe 2003:10). The Complexity Systems thinking approach, can provide information about the underlying make-up and patterns of interaction and the constant progression of a system over time, such as that of education and IKS.

Although IKS are still valuable and practiced in several indigenous communities throughout the world, they still not recognised in Africa's formal education which is still dominated by Western education and its languages. There are important educational practices entrenched in IKS that act as a catalyst for encouraging social interactions and self-respect necessary to create a multi-cultural world of mutual engagement and sustenance (Govender, 2012: 114). The elements in complex systems such as IKS dynamically interact by exchanging information to form a rich network structure. These systems are usually described as open, organic, recursive, nonlinear, autopoietic, adaptive and emergent (Govender, 2012:117). Govender quoting Davis & Sumara (2006) also states that some of the critical metaphors from Complexity applied to social and education systems can be equally valid for IKS such as:

'self-organization, complex adaptive systems, non-linear change, emergence, diversity, differentiation and autopoiesis, networks, connectivity and relations, order without central control, feedback, open systems, collectively, distributed knowledge, holism and co-evolution'.

Several IK systems worldwide through destruction and colonisation of their own cultures have incorporated their lifestyles in varying degrees in an effort to integrate Western culture, education and economies. Nonetheless, their view of the world, for most, is still embedded in their cultures and when cultural boundaries are crossed, new challenges in education arise. Emergence as a metaphor for complex systems theory is therefore advantageous in investigating how changes, new links and hubs are formed when IKS are integrated with other knowledge systems (Govender, 2012: 127).

Doll claims that the major strength of post-modernism is the development of new knowledge and the transformation of learning, citing notions such as "self-organization, dissipative structures, ecological balance, punctuated evolution and complexity theory" (1993:12). Incorporating metaphors of autopoiesis, holism and emergence into IKS teaching and learning in complex systems terms focuses on the unpredictable and generative features of educational processes (Gough 2012:41). As a result of its interactions with other knowledge systems, IKS becomes both a catalyst for transformation and a recipient of transformation through feedback loops. Breidlid (2009) emphasises the importance of classroom and community learning and teaching of IKS as crucial for community development and meaningful education.

Integrating IKS into the official educational system necessitates an awareness of how to interact with other knowledge systems as well as how to improve cross-cultural understanding. Kincheloe and Steinberg emphasise the importance of allowing for the evolution of IK in the classroom and its ever-evolving relationship to Eurocentric scientific and educational practice (2008:143). Autopoiesis, emergence and holism are metaphors that can be used to analyse and track transformation routes in IKS (Govender, 2012:130).

A systems theory approach, it is evident, will provide a deeper knowledge of general nature and society as a whole. This understanding of people, organisations and societies' aspects, interconnections and objectives will aid in comprehending the larger picture of the society's links and function. Systems theories make it useful to understand the complexities of IKS and ways in which it can be related and incorporated into the education system through the curriculum.

3.3 UNDERSTANDING IKS IN EDUCATION THROUGH SYMBOLIC INTERACTIONISM

Symbolic interactionism is a micro-level theoretical framework and viewpoint in sociology that studies how society is constructed and sustained through iterative interactions between individuals. The Framework was created to better understand how society works from the ground up, focusing on micro-level processes that emerge during direct human interactions to explain how society works. Individuals employ language and meaningful symbols in their communication with others, which is central to symbolic interactionist theory. Symbolic interactionism is concerned with how individuals' recurrent, meaningful interactions come to define society's makeup (Carter & Fuller, 2015:1). This is a useful framework to understand areas of society such as education and knowledge systems, hence its application in this study. In the study, the repeated interaction between learners and teachers in the classroom will be a focus, taking into account the meaning they place on the interaction with each other and also on the meaning placed on IKS.

The theory suggests, objects, ideas, events, people and other parts of the social world influence and affect humans and individuals in turn put meaning to these interactions in order to ascertain how to act in those specific situations. Teaching is a way of implementing the curriculum in the classroom, this is a practice that require much interaction between learners, teachers, society, teaching tools. From this interaction, much meaning is placed through experience which also determines the effectiveness of the implementation of IKS in the curriculum. This framework can help us understand how the incorporation of IKS can happen, taking into account teachers' experiences

within the classroom as they interact with learners. It could help us understand which aspects of IKS can be brought into the curriculum. For instance, using indigenous games in the classroom, with symbolic interactionism, the objects, language can be of value in deciding what subject matter and principles a specific game can be used for. For instance, an indigenous game that requires collection of stones as winnings, may be used by the teacher to teach on money matters, taking into account how learners from their previous interaction, place meaning to the stones as objects in this game.

Another way in which IKS can promote interaction in the classroom, could be through the telling of folktales as part of teaching, the symbols in such tales, language used and also the required attention and response required by narrator from listeners can help teachers teach certain subjects in the classroom, by drawing from learners and their own experiences and meanings placed on them. Symbolic interactionism is a useful framework of understanding IKS in education.

Learning is defined as a learner's interaction with other individuals as well as the instruments available to aid in the learning process. Such conversations can take place with a knowledgeable third party, such as a teacher, or between peers (Warford, 2010). A learner may interact with physical tools, artefacts, or psychological tools while studying with a teacher, according to Engeström (2001). On a social level, learning involves other people and intermediary objects, while on an individual level, learning involves how the learner processes and internalises knowledge through a meaningmaking process (Wertsch, 1991). This means that people first encounter the world through social processes in which language, knowledge and experiences are shared culturally through other students, adults, mediating technologies and objects, or a teacher (Mandikonza, 2019:4).

IKS research has moved to various disciplines, including education and African languages, especially in Sub-Saharan Africa. After 1994, IKS became part of the curriculum in South Africa to honour the country's historical and cultural heritage, which is very diverse (DoE, 2002). DoE states in relation to the languages learning area that when possible, 'learners' native languages should be utilised for learning and teaching. This is especially true in the Foundation Phase when children are learning to read and write.' (2002:20). IKS is recognised in the curriculum as a means of

providing artistic, cultural and imaginative skills that enable learners to understand the world, especially in language learning. (DoE 2002). The definition of the Mathematics learning area by DoE (2002) also shows that IKS is being considered in the different curricula across , Mathematics is defined in part as 'It is an intentional activity in the framework of social, political and economic aims and restrictions; it is a product of different cultures' study. It is neither value-free nor culturally indifferent.' (DoE,2002:21).

The Natural Sciences, Life Sciences and Physical Sciences curricula declarations also mandate and strengthen IKS. Subjects should be more closely tied to learners' societal or cultural context in South Africa to reduce conflicts that may develop from learners' perspectives on the world and the perspectives on which the learning areas being taught are based. (Naidoo, 2010:15). The success of implementing IKS in the curriculum may depend on the meaning and value placed by teachers and learners on the types of knowledge itself. Looking at IKS in education through the lens of symbolic interactionism is a step of determining various aspects and approaches of incorporation into the curriculum

3.4 MOVING IKS INTO THE CLASSROOM: CONSIDERATIONS

South Africa's vast cultural diversity and biodiversity provide excellent learning opportunities for students of Life Sciences and other topics. South Africa faces a lot of obstacles as a growing economy, including unemployment, poverty, food security issues, infections and pandemics such as HIV/AIDS and a lack of competent healthcare for many South Africans, particularly in rural areas. Even after 1994, the country's problems of high poverty, inequality and unemployment linger. The national upper bound poverty level of R992 per person per month in 2015 prices remains high for an upper middle-income country, with more than half of South Africa's population living in poverty. South Africa was also one of the most unequal countries in the world in 2015, with a consumption per capita Gini index of 0.63. (World Bank Group: 2018).

According to Statistics SA, the country's unemployment rate grew to 32.5 percent in the fourth quarter of 2020, up from 32.5 % in the third quarter. Another problem that South Africa is dealing with is HIV/AIDS. The overall HIV prevalence rate in the South

African population is estimated to be at 13,1 %. In 2018, the total number of persons living with HIV was expected to be around 7.52 million. HIV infection affects an estimated 19,0% of persons aged 15 to 49 years (Statistics South Africa,2018:1). Economic growth is jeopardised by these impediments. Scientists like Van Wyk and De Beer (2012) believe that incorporating indigenous knowledge can assist in addressing many of these issues (De Beer & Mothwa, 2013:453).

It is one thing to have policy that advocates for the implementation of IKS in the classroom and another of having that policy being practically implemented. Although there are the pronouncements for IKS implementation in the curriculum, there doesn't seem to be clear guidelines on how this must be done. It has been noted that the success of such curriculum reform attempts is likely to be heavily reliant on the attitudes and values of instructors and students toward the incorporation of IKS into the school curriculum (Webb, Ogunniyi, Sadek, Rochford, Dlamini & Mosimege, 2006).

The inclusion of IKS in the curriculum has been studied in areas such as the science curriculum. It has been identified that it presents a challenge to science instructors who must identify different parts of IKS and figure out how to include them into the classroom science curriculum. Some educators deny the existence of IKS that can be integrated with school science, which is one of the problems (Manzini, 2000). When bringing IKS into the science curriculum, it is vital to assess science teachers' knowledge and practice, as these factors influence how they respond to educational change to a considerable extent (Duffee & Aikenhead, 1992). The fundamental assumption is that scientific teachers' knowledge and beliefs are important drivers of how they teach and respond to educational innovations, such as enhanced IKS in science instruction (Naidoo, 2010:63).

The challenge of identifying which aspects of IKS to include would not only be evident in the science classroom, but in other subjects as well. Classrooms in South African schools, particularly in urban and township settings, are typically multilingual and multicultural. Learners are exposed to a scientific perspective as well as a traditional worldview based on cultural beliefs and values. Teachers must guarantee that transfers from their old worldview to the scientific worldview are as easy as possible (Aikenhead, 1996). Teachers should be aware of the distinctions and similarities

between scientific and IK-based worldviews, particularly from the perspective of students (Naidoo, 2010). This is an important element to consider when thinking about IKS in South Africa, where the backgrounds of many learners are so varied.

The necessity to integrate IKS across curriculum in diverse learning areas in South Africa has a socio-political and socio-historical backdrop. It is stated that to engage in IKS, educators and policymakers must investigate the political implications of colonialism in order to understand how and why colonialism resulted in the creation of knowledge and power hierarchies (Odora-Hoppers, 2000: 9).

Globally there has been studies that involved IKS in the curriculum that South Africa can refer to as part of moving towards having the knowledge in the classroom focussing on challenges and successes. Examples of such studies include the Curricula for Native Americans in North America, Australian Aboriginals and New Zealand Maori. These curricula have not been completely successful and the main reason for this is because the programs tended to consider learners from indigenous cultures as blank slates (Bishop, 1990). Teachers' studies looked at why nonindigenous teachers don't include IKS in their scientific classes (Silva, 2003). There are a variety of reasons for this, one of which is that professors believe IKS should not be included because they are not indigenous. The second issue is that many science teachers do not consider IKS to be scientific). (Naidoo, 2010:61). These are also similar issues that should be considered in South Africa that might create challenges for the incorporation of IKS in the curriculum. IK of various native groups serves as a foundation for further educational development in educational programs such as the World Learning for International Development (WLID), the Alaska Rural Systematic Initiative (AKRSI) and the Global Fund for Children (GFC); learning in this case is based on IK of the population (World Bank: 1998). In Africa, education papers such as the Ndegwa Reports from 1971 and the Ominde Report from 1964 show that the government recognises the need of integrating IKS into the official school system (Owuor, 2007). According to Owuor, Kenya's integration of IKS is hampered by the Eurocentric-based education system, which places teachers at the centre of classroom knowledge development. There were no outlets for exchanging ideas

where individuals of indigenous communities' abilities could be integrated into proper classroom knowledge generation (Badugela, 2019:23).

According to Muza (2014), in the 'South African Grade 9 teachers ' and learners' knowledge about medicinal plants and their attitudes towards its integration into the science curriculum' some of the key research findings on IKS integration include the emphasis on aspects of redress and decolonising the mind; advocating for the use of indigenous research methods and the de-Westernisation of IKS models (Smith, 1999; Mpofu, Mushayikwa, Otulaja, 2013); and those who advocate the use of indigenous research approaches and the de-Westernisation of IKS paradigms (Smith, 1999; Mpofu, Mushayi (Keane, 2006; Malcolm, 2005).

Other scholars advocate for a critical examination of IKS as well as a need for rational debate in research, educator education and classroom practice (Moyo, 2011; Webb, 2006). The call to document and archive the IKS in diverse locations (Otulaja, Cameron, & Msimanga, 2011) has to be supported, since it may be the only way to accomplish full IKS-science integration in the future. If South Africa is to be successful in incorporation, it needs to be clear on what it hopes to achieve with having IKS in the curriculum, with a clear goal, the incorporation and implementation will then work to serve that goal. All of the above aspects are very important to consider.

3.5 ADVANCEMENTS FOR IKS IN HIGHER EDUCATION CURRICULUM

In order to tackle the country's developmental difficulties, the National IKS Policy (2004) designated the advancement of IKS in higher education as a crucial element of human capital and the transformation dimension of higher education (DST). This is because policymakers, researchers, scholars and development institutions are increasingly realising that a country's capability to leverage on and mobilise the knowledge systems that its people hold for socio-economic progress is just as important as having physical and financial capital (Kaya & Seleti, 2013: 38).

Progress made for IKS includes one of the group partner institutions in IKS which is the Department of Science and Technology-National Research Foundation (DSTNRF) Centre, which is housed in the IKS Centre inside the Faculty of Agriculture, Science

and Technology at the North West University's Mafikeng Campus (CIKS). The University of KwaZulu-Natal (UKZN), North West University (NWU), University of Limpopo (UL), University of South Africa (UNISA) and University of Venda are among the partner universities (UNIVEN). In accordance with the IKS policy of 2004, the key duties of CIKS are to enable research, education and training, information exchange, networking and the provision of service. The certification of a two-year Masters of Indigenous Knowledge Systems (MIKS) program has also been accepted by the Higher Education Quality Committee (HEQC) and the Council on Higher Education (CHE). (NEPAD: Southern Africa Network for BioSciences).

Another advancement is the NWU Program coordinators worked with the National IKS Office (Department of Science and Technology, 2004) and the South African Qualification Authority to register a professional four-year Bachelor of IKS (BIKS) degree that combines natural and social sciences. This was done to ensure that IKS isn't just for humanities students. Human and social science subjects made up the majority of the existing program. Furthermore, the BIKS Program was endorsed as a regional program at the Southern African Development Community (SADC) Ministerial Conference on IKS Policy, which occurred in the Seychelles in August. This will help to promote IKS across the region and create a network of personnel and other resources to help the program's teaching, research and community engagement (Kaya & Seleti, 2013: 41)

Universities that recognise the potential usefulness of IKS have commenced to modify curricula to integrate IKS and some universities in South Africa are putting more emphasis on IK problems, leading to the creation of IKS faculties. Four historically disadvantaged colleges began offering a Bachelor of IKS degree in 2009, namely UNIVEN, UL, NWU and UKZN (Naidoo, 2010: 14). The Bachelor of Indigenous Knowledge Systems Qualification is equivalent to similar international qualifications given in Canada, Australia and New Zealand, which were chosen as a point of comparison because these countries are thought to be leaders in the field of IKS. According to Naidoo, the introduction of the National IKS policy coincided with expectations on the school science curriculum to contribute significantly to national

development, resulting in a period of increased awareness of IK in South Africa (2010:15).

The universities in Africa, if they are to play an impactful, transformational and liberatory role in society, they must alter their curricula and intellectualise African languages, according to the African Renaissance concept (Mangu 2006). Higher education transformation also necessitates the examination and incorporation of IKS's historic contributions to civilisation and global knowledge overall into curriculum (Finch 1990). It is crucial to stress that the pursuit of incorporating IKS in higher education transformation does not imply a rejection of other knowledge systems. (Mkhize & Ndimande-Hlongwa, 2014:21).

Universities in South Africa have responded to IKS and the African languages imperatives in a variety of ways. Best practices can be found, for example, at Rhodes University, which houses the NRF SARCHI Chair in African languages and at the University of KwaZulu-Natal (UKZN), which houses an IKS Centre of Excellence. Furthermore, starting of 2014, all undergraduate students at UKZN are required to complete an isiZulu program. The UKZN Language Policy was approved by Council in 2006 and the Implementation Plan is now being amended. The use of isiZulu as an extra medium of instruction is justified under the UKZN Transformation Charter (2012). Similarly, the Language Planning and Development Directorate has been tasked with advancing isiZulu's development as a teaching and learning language. This includes the creation of terminology. The 'Multilingualism to Promote Access, Retention and Successful Professional Training' initiative was funded by the South African Norwegian Tertiary Education Development Programme (SANTED) (Ndimande- Hlongwa, Balfour, Mkhize & Engelbrecht 2010). This project presented the University with an opportunity to address multilingualism in higher education challenges. (Mkhize & Ndimande-Hlongwa, 2014:27).

3.6 EXAMPLES: MODELS OF INCORPORATION IN AFRICAN SCHOOLS

This section will highlight some examples and models used to incorporate and integrate AIKS in school taking mainly the example in science education. In Naidoo (2010) Various models for IKS in science education are mentioned in the literature. For example, Snively (1995) provided a Five-Step Model, Malcolm (2002) presented a Learner-Centred Model and Aikenhead (2002b) proposed a Research and Development Model. These models, in addition to having the potential to teach western science and IKS, also retain a significant degree of learner culture.

Snively's Five-Step Model is more thorough and includes elements from both of the other models. Snively (1995: 27) provides a five-step procedure for creating a Traditional Ecological Knowledge (TEK) unit in cross-cultural scientific instruction, which is a division of IKS. While teaching any one issue or subject matter, the model gives a general framework for exploring the two views, namely, western science and IKS (Naidoo, 2010:91). The following is a description of the procedure:

Step 1: Pick a science concept or topic that you're interested in (e.g. Agriculture, animal migration, sustainability).

Step 2: Determine your own personal knowledge (may be cultural, social or environmental).

- Talk about how important it is to respect other people's beliefs.
- Make a list of what we know about the concept or issue.
- Create a list of questions related to the theme or issue.
- Recognise personal ideas, views, or viewpoints.

Step 3: Investigate the different viewpoints.

- Investigate the western/modern science viewpoint.
- Investigate the diverse indigenous viewpoints.
- Organise and process the data.
- Make a list of the parallels and contrasts between the two viewpoints.

- Ensure that the perspectives are provided with genuine explanations.

Step 4: Reflect • Think about the implications of each viewpoint.

Think about the topic or issue from a variety of angles.

- Think about the ramifications of a synthesis.
- Think about the topic or issue in terms of ethics, values and wisdom.
- Consider the notion or issue from a historical standpoint, if applicable.
- Consider whether it's possible to accept the existence of opposing opinions.
- Take into account the possibilities of a common vision.
- Make sure students compare and contrast their prior and current perspectives.
- Come to an agreement.

Step 5 Evaluate the process.

- Assess the decision-making procedure.
- Assess the consequences of individual or group activities.
- Consider the prospects for future inquiry.
- Evaluate how each person felt during the process?

(Naidoo,2010:92).

According to Snively and Corsiglia (2001), the purpose of utilizing such a model is to cultivate scientific thinking and to embed science studies in students' everyday lives, rather than to determine if one form of science is more relevant than another.

The Learner-Centred Paradigm offered by Malcolm (2002), who states that learner centred science is obviously multicultural and rejects the notion of one science, is a second alternative model for teaching IKS in science. According to him, by focusing on the IKS that the learner brings to the learning setting, the model can make teachings more culturally relevant. Teachers would be required to identify instances and circumstances that correspond to students' interests, assisting them in extending and reconstructing their knowledge in ways that engage diversity. Step 2 of Snively's (1995) Five Step Model incorporates this fact that IK is located in the learner (Naidoo, 2010.93)

Naidoo also mentions Aikenhead's (2002b) Research and Development Paradigm as a third feasible model for IKS in science education. A popular method for incorporating IK in this paradigm is to create an indigenous group framework at the start of each unit. Learners participate in gathering local information from elders and other knowledgeable members of the community and they are taught how to approach these experts in a professional manner (Naidoo, 2010:94). The knowledge is recorded in an acceptable manner by the learners, and it is shared and merged in the class. Learners are introduced to Western science in order to gain a better understanding of their native environment. This attitude, according to Aikenhead, embraces the coexistence of two worlds. The approach emphasises the importance of IK in the community, which is similarly emphasised in step 3 of Snively's (1995) Five Step Model. In South Africa, with not much recorded IKS material, this model will be a great starting point with programmes that have learners engaging with the community and sharing information in a class setting. The three Models are useful to help to focus on the possible integration of IKS in the School curriculum

There has been some attempt to direct how educators are required to IK into the curriculum, for example, in the Natural Sciences-senior phase, the following assessment requirements of LO3 for the various grades have been developed (Department of Education, 2002a: 20-21). For example, 'Understanding science as a human endeavour in cultural context' is a study area (Grade 7). When a learner compares different interpretations of events, for example, this is an example of achievement. There has been some attempt to direct how teachers are required to include indigenous knowledge into the curriculum, for example, in the Natural Sciences-senior phase, the following assessment requirements of LO3 for the various grades have been developed (Department of Education, 2002a: 20-21). For example, 'Understanding science as a human endeavour in cultural context' is a study area (Grade 7). When a learner compares different interpretations of events, for example, this is an example of achievement. Teachers can use the clearly specified assessment standards and vivid examples as leverage to guarantee that IKS is adopted (Naidoo, 2010).

Another example of how IKS can be incorporated in learning is reflected in the approach set out by Govender, Mudaly and James in the study '*Engaging Indigenous Knowledge Holders in Teaching Preservice Teachers in IKS Food Production and Practices: Implications for Higher Education*'. Two IKS knowledge holders were part of a one-day workshop, where they shared their knowledge of agricultural practices health, food security and sustainable development as a means of integrating IK knowledge holders in an academic setting and to formally recognise their knowledge and skills in an academic module. At the time, 49 preservice teachers were enrolled in a university course in Science Instruction, which was preparing them for transformative education in the new South African school curriculum. This course covered IKS teaching and learning, as well as scientific concerns related to IKS and how to prepare teachers to start gardens on campus and in their communities. The preservice teachers were allowed to express their good views of an IKS learning experience through surveys and reflections throughout the study and the data demonstrate that they valued the therapeutic benefits of plants integrated in IKS in particular.

They were also inspired to pass on their IKS to their learners and communities through transgenerational knowledge transfer. They also advocated the integration of IKS and indigenous knowledge (IK) bearers into academia but did not specify how this might be accomplished. (Govender, Mudaly & James and 2016:201). This study is useful in that it highlights the importance of different role players that can play a crucial part in ensuring the success of incorporating IKS in the classroom especially local indigenous communities. There needs to be buy in from community knowledge holders and also teachers need to be capacitated through courses and workshops.

Muza (2014) writes about a model of integration of IK and western science proposed by Ng'etich (1996), in which three categories of integration are identified namely – integration of one thing into another, integration of one thing with another and integration of one thing and another.

- The assumption is that IKS is a subset of western science. It could be seen as implying that IKS is less valuable and useful than western science.

- Integration presupposes that the two systems be equal in importance and utility, therefore they are equally important and valuable. Integration that isn't predicated on how important these two systems are to each other. As a result, the question is not one of abandoning one system in favour of another, but rather one of combining the two, such that the older belief and the western scientific view may coexist. The learner's duty is to acquire scientific principles with their indigenous beliefs and to understand when one believes should be used over the other (Gunstone & White, 2000).

3.7 IMPLICATIONS ON IMPLEMENTATION OF IKS IN THE CURRICULUM

In the study 'Indigenous Knowledge Systems: implications for natural science and technology teaching and learning' Van Wyk discusses the wider implications of IKS, these are elaborated upon in terms of its political, interpersonal, policy, institutional, linguistic and cognitive, methodology and ethical principle. Although the study is specific to Science and Technology, the implications discussed can be applied across other subjects as they speak to personal and systematic practices that affect teaching. Politically, in South Africa historically, it is stated that in South Africa, science and technology have been the preserve and monopoly of an ethnic minority (Mehl & Rhodes, 1989: 220). The majority of South Africans were legally excluded from politics, leading to distorted beliefs that Blacks are not "naturally" oriented to science and technology. In terms of IKS, educators will need to build political will and engage in change on a regular basis so that their identification of science and technology requirements and opportunities leads to relevant, yet constantly changing planning and evaluation that includes all learners (Clare & Sisson, 1990:3-15).

Interpersonally, Van Wyk states that the science and technology curriculum cannot function effectively unless it recognises and celebrates learners' social needs and confidence (Dunn & Larson, 1990:14). In terms of IKS, the school will always be a key place (Cornbleth, 1990:110) for facilitating increased interaction between and among various learners, educators and institutions within communities. Educators in science and technology can support participatory, exciting and inquisitive ways that will appeal to students of all ages. In terms of policy, historically, the political ruling class has established an effective policy framework at every level of education, which has

disproportionately excluded Black students in science and technology. Indigenous viewpoints were frequently dismissed as strange, primitive and unscientific (OdoraHoppers, 2000:2). Policy initiatives in science and technology education should allow the integration of all learners' knowledge systems in a supportive atmosphere that fosters confidence and self-esteem (Odora-Hoppers, 2000:6). (Benson, 1992:14).

Historically, schools and institutes of higher learning focused their scientific and technological efforts on exclusive, mainstream scientific paradigms, ignoring the importance and realities of African viewpoints (Odora-Hoppers, 2000:3). Changing institutional and cultural practices necessitates a commitment from everyone in the organization/school to review inclusive norms, values and policies. IKS also aims to achieve social justice, particularly in South Africa, where financing for previously mainly white schools and other institutions for resources (such as laboratories and equipment) has been vastly in excess of other groups. (Van Wyk, 2010). OdoraHoppers (2000:5) expands on the methodological implications of IKS, stating that they will help educators become more aware of themselves and their students. Hawkins (1990: 97-139) advises educators, particularly in science, to become aware of cultural or other gaps in their students' experiences and to find ways to bridge them.

Ethically If IKS is to humanise and affirm learners (Odora-Hoppers, 2000:7), educators must confront the inequities of the South African past on a moral level, particularly with relation to IKS to the apparent neutrality of science and technology. Learning how to include an appreciation of cultural diversity and IKS techniques into science and technology teaching is an ethical requirement for educators and curriculum developers (Van Wyk, 2002).

Naidoo analyses the consequences of IKS for policy, classroom practices, teachers, teacher education and IKS teaching by drawing on the experiences of teachers who have implemented IKS in the classroom. In terms of policy, she says that

'More is required of it in terms of providing teachers with clear directions related to the implementation of IKS in science lessons. The policy also needs to move to the next phase of critically addressing postcolonial discourses of power, social justice and equity among alternative ways of knowing. This

would expose teachers to the debates on IKS, which might help teachers to contextualise their thinking and teaching in a broader personal, social and political context' (2010:211).

On implications for classroom practices, IKS learning, according to Naidoo, encouraged learners' feeling of agency by incorporating genuine experiences into their education and providing opportunities to engage and motivate them. Naidoo outlines three possible approaches for including IKS in the curriculum. The incorporationist approach, which seeks out how "best IKS fits into science," the separatist approach, which holds IKS "side-by-side" with scientific knowledge and the integrationist approach, which seeks for "connections" between IKS and science. (Naidoo, 2010:181). All these approaches can be valuable in the attempt to include IKS in the curriculum and in some cases, teachers may end up using a combination of any of the three.

Teachers would have to validate and possibly reorganise IKS according to western framings in order to relate to classroom themes utilizing the incorporationist method. Topics will only be chosen if they can be linked to science. IKS that is likely to be in contradiction with science, such as philosophical or religious IK, will not be allowed in classes. This would limit the IKS presented into courses and teachers would only be able to adapt IKS that connect to their own underlying ideas and values (2010: 212-213). Teachers' implications take into account their origins (cultural, political and social) and it's possible that they will understand and apply IKS in different ways in the curriculum as a result. Teachers with a strong empirical worldview, for example, might use the incorporation strategy to focus more on science explanations. Teachers with political ties may use IKS for social justice reasons and a distinct and equal approach would be preferable. Teachers with a cultural background or personal knowledge of the IK being utilised in the classroom may be better equipped to take an integrationist approach (Naidoo, 2010:214).

3.8 CONCLUSION

Incorporating IKS into all levels of education is no doubt advocated for through policy, research and to some level in the curriculum. The main issue is to fine tune what already exist to ensure that implementation of policy is fruitful. This chapter has outlined some theoretical frameworks in relation to IKS in education. Having IKS in South African classrooms is the main goal and is what this study aims to understand, hence some the chapter discusses some considerations that must made for this to successfully happen. It has been also important to note some of the advancements that have been made in South Africa at a tertiary education level of which the chapter mentions. There are different ways in which incorporation of IKS in the classroom can be done, a few of the models are reflected upon which might be modified to suit what South Africa hopes to achieve. Finally, the chapter focuses on the implications that need to be taken into consideration, some political, personal and also for teachers and learners, when embarking on the implementation of IKS in education.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter describes the research methodology used for this study, which helped in getting get to the answers for the research questions. The chapter will firstly outline the research design, under which the qualitative research paradigm is explained as well as the case study approach. The section that follows is focused on data collection. It explains data sources in relation to this particular study and data collection techniques such as focus groups and interviews. In the remaining sections, different types of sampling techniques such as purposive and convenience sampling are discussed. Data analysis and interpretation methods are presented, this section explains the importance of this step in qualitative research and will explain the analysis method that has been used in this study which is the thematic analysis method. Since this is a qualitative study, the issue of trustworthiness will be discussed. Finally, ethical measures that need to be considered for qualitative research are touched upon.

4.2 RESEARCH PARADIGM

This section looks at the research paradigm adopted for this study as well as the philosophical assumptions underpinning the chosen paradigm. Generally, a paradigm can be best defined as a whole system of thinking (Neuman, 2011:94). In this view, it refers to the recognized research traditions in a particular discipline (Mouton 1996:203). To be more specific, a paradigm would include the accepted theories, traditions, approaches, models, frame of reference, body of research and methodologies; and it could be seen as a model or framework for observation and understanding when conducting research (Creswell, 2007:19; Rubin & Babbie, 2010:15).

When it comes to research, a paradigm is defined as

‘A set of assumptions or beliefs about fundamental aspects of reality which gives rise to a particular worldview – it addresses fundamental assumptions taken on faith, such as beliefs about the nature of reality (ontology), the relationship between

knower and known (epistemology) and assumptions about methodologies'
(Nieuwenhuis, 2007:47).

Clearly a paradigm plays a key role in the research process, as it is the starting point for the researcher in conducting a study, through which thoughts are framed on the direction of the research. Taking into consideration the theoretical frameworks that were discussed in the previous chapter, the researcher aligned this study by adopting the interpretivist paradigm, which was considered suitable for this qualitative study.

4.2.1 Interpretivist paradigm

In research the two leading philosophical schools of thought or assumptions in research are positivism which underpins quantitative methodology, and interpretivism, which underpins qualitative methodology (Tuli, 2010; Daymon & Holloway, 2010). Interpretivist paradigm, under which this study is undertaken, sees the world as existing on individual's perception, meaning it is therefore subjective since it can be interpreted differently depending on the perspectives, experiences and positions of individuals (Cohen, Manion & Morrison, 2018; Elshafie, 2013). This paradigm is interested in the unique individual, which is known as idiographic and takes into account understanding over scientific explanation (Daymon & Holloway, 2010; Nieuwenhuis, 2007). The interpretive paradigm is also referred to as the phenomenological approach, an approach that aims to understand people (Babbie & Mouton, 2008:28). Humans are always trying to interpret, create, give meaning, define, justify and rationalise daily actions (Babbie & Mouton, 2008:28). Under interpretivism, the aim of research is to understand and interpret everyday happenings, experiences and social structures and the values people attach to these events (Collis & Hussey, 2009:56-57; Rubin & Babbie, 2010:37).

In this study the researcher wanted to gain understanding of the different experiences that educators have in relation to AIKS. Through the focus discussions conducted in the workplaces of the educators, the researcher could observe even reactions to the environment within which educators operate. Explanations were sought through the group discussions on how educators incorporate AIKS, if they do, and why not, in cases where AIKS was not being incorporated by the educators. The researcher used the interpretivist paradigm, since their experience from previously conducting

academic research at honours level, provided the experience to engage groups in their settings in order to understand their experiences. Using that experience and work experience in which the researcher liaises with different stakeholders, assisted in conducting the focus group discussions as well as the interview, and the researcher was able to deduce from these engagements, different conclusions. The researcher would also interpret data using their experience of analysis of written data gained at work. The use of open-ended questions in the focus group discussion and semi-interview schedules, was intended to encourage interaction which would help the researcher reach the goal of understanding and getting more of the participants' experiences about AIKS.

4.2.2 Philosophical assumptions underpinning the interpretivist paradigm

The interpretive frameworks carry different philosophical assumptions. Philosophical assumptions that characterise the interpretivist paradigm are ontology, epistemology, and methodology (Bunniss & Kelly, 2010).

4.2.2.1 Ontology

Ontology is more about the nature of our beliefs about what is real (Richards, 2003:33). According to Tuli (2010) qualitative research is rooted on interpretivist ontology. Interpretive ontology pronounces that reality exists as multiple realities since it is created by individuals in groups, and not as a single reality (Nguyen, Gardner & Sheridan, 2019). The multiple realities are subject to change due to the social world even though they are individually and uniquely constructed (Daymon & Holloway, 2010).

In this study, the ontological assumption was that educators would have different experiences when it comes to the incorporation of AIKS in the classroom, based on their different realities and backgrounds. The multiple realities of the educators would assist the researcher to understand the different perspectives about AIKS and how it could be incorporated in education before drawing conclusions. This step of looking closely into the educator's realities was important for the study, which is why this philosophy was embedded in the study. The evidence of multiple realities is also

reflected in the different themes of the study during the data presentation step of the research.

4.2.2.2 Epistemology

Epistemology is

‘The branch of philosophy that studies the nature of knowledge and the process by which knowledge is acquired and validated’ (Gall, Gall & Borg, 2003:13).

According to Tuli (2010) epistemology can be described as asking the following questions:

- What is the relationship between the knower and what is known?
- How do we know what we know?
- What counts as knowledge? (Tuli 2010:99).

In conducting this study, the researcher looked at every individual’s unique experience, how they viewed the world and how they understood what constituted knowledge depending on backgrounds. The researcher also wanted to find out how the educators know what they know about AIKS, and how they related to the knowledge that they have when it comes to AIKS. Going to the specific areas where the educators lived and worked, provided more emphasis on the impact of experiences when it came to how educators viewed what knowledge is. The responses given for example, where educators use proverbs as example to show how knowledge is formed and imparted was useful during the study. Engaging with educators was necessary to understand what they perceived as AIKS, which in turn gave an understanding of what they perceive as knowledge that can be taught in their classrooms. The inclusion of the representative from DBE, was for the researcher to get a view from a curriculum development perspective, on what is regarded as knowledge and whether AIKS formed part of what is deemed by DBE as knowledge (scientific or otherwise).

4.2.2.3 Methodology

Kothari (2004) explains research methodology as the process to solve the research problem, it is an investigation of reviewing how research is conducted in a systematic way. Methodology is made up of steps that a researcher takes to collect, analyse,

describe data and understand a phenomenon that is being studied (Nieuwenhuis, 2016).

This study adopted a qualitative approach through case study design where educators were studied within their environment, which is in line with interpretivist paradigm. In the context of finding out the experiences of educators in the incorporation of AIKS in the curriculum, focus group discussions were held with the participants to find out their understanding on AIKS. The benefits and challenges that arise when trying to incorporate AIKS for the educators were also highlighted. The Semi-structured interview was also conducted with a representative from DBE, to understand the department's stance on the incorporation of AIKS.

4.3 RESEARCH DESIGN

A research design is a strategy for achieving research objectives and resolving research problems by responding to study research questions. The design is the major road map that outlines the approaches and procedures for gathering and analysing data. The key goal is to show if the data was acquired in a way that is appropriate for the questions addressed (Mihirka, 2014). A design is utilised to frame the study as well as to indicate how all of the primary aspects of the research samples come together in an attempt to answer the central research questions, according to Badugela (2019:87).

4.3.1 Qualitative Research

The qualitative approach was utilised to investigate the research topics suggested in the study. Qualitative research investigates encounters in which "the qualitative researcher strives to get involved in the topic of investigation" (Auriacombe, 2015: 36). The likelihood of qualitative data to more fully describe a phenomenon is crucial to consider not only from the researcher's point of view, but also from the reader's (Hoepfl, 2007: 1). Qualitative research studies are known for being rich in detail and insight into participants' worldviews. The goals of this form of research are to understand some aspect of social life and the procedures are to create words as data for analysis rather than numbers. Qualitative research procedures differ from quantitative research methods in that qualitative research uses various knowledge

claims, inquiry methodologies and data gathering and analysis approaches (Creswell, 2003), Qualitative research aims to gain a deeper understanding of human behaviour and the factors that influence it. The design is based on social science and is more interested in understanding why individuals behave the way they do (Hossain, 2011:144).

Qualitative research is also defined as “a form of systematic empirical inquiry into meaning” (Shank, 2002:5). Systematic, meaning that is “planned, ordered and public”, following rules agreed upon by members of the qualitative research community. In the sense that it is based on personal experience, it is an empirical enquiry. Researchers who are interested in meaning strive to figure out how others interpret their experiences. Another argument is that qualitative research is interpretive and naturalistic, implying that qualitative researchers explore phenomena in their natural environments, aiming to make sense of, or interpret, occurrences in terms of the meanings individuals assign to them (Denzin and Lincoln, 2000:3).

Qualitative research involves methods such as logic, ethnography, discourse analysis, case study, open-ended interview, participant observation, counselling, therapy, grounded theory, biography, comparative method, introspection, casuistry, focus group, literary criticism, meditation practice, historical research and others (Cibangu, 2012, cited in Moharaj, 2018:2). Interviews, diaries, journals, classroom observations and immersions; and open-ended surveys are used to gather, analyse and interpret data from visual and textual elements, as well as oral history (Zohrabi, 2013). It is exploratory and attempts to explain 'how' and 'why' a specific social phenomena, or program, operates in a given context (2013). (Polkinghorne, 2005, Cited in Moharaj 2018: 2). It can also be descriptive and explanatory.

There are a number of benefits for adopting the qualitative approach in research. The ability of qualitative research to produce detailed textual descriptions of how people experience a given study subject is one of its strengths. It contains information about people's actions, beliefs, views, feelings and relationships. Intangible characteristics such as societal norms, socioeconomic status, gender roles, race and religion, whose impact in the research issue may not be easily evident, can also be detected using these methodologies. Findings from qualitative data can often be applied to people

with similar characteristics to those in the study population but gaining a rich and complex understanding of a specific social context or phenomenon usually takes precedence over eliciting data that can be applied to other geographical areas or populations. Qualitative research differs slightly from scientific research in this regard. (Mack, Woodsong, MacQueen, Guest & Namey, 2005:1).

The aim of this study is to understand the perspectives of participants regarding the indigenous knowledge and its value in their lives specific to the educational sphere. The predominant goal of the research is to explain how knowledge can be incorporated in schools. It also aims to explore the role of indigenous knowledge in the lives of its knowledge custodians in Africa. The use of a qualitative method ensured that not only the perspective of the researcher that came forth during the study. The researcher was able to get the experiences of the educators by conducting discussions with them in their school setting and around their own social contexts. The semi-structured interview that was conducted with the representative from DBE was also useful, and the structure of the questions were such that the interviewee had space to provide more information and was aware that there would be follow up question, as more information was being shared.

4.3.2 Case Study Approach

It was mentioned in the preceding section that a case study is one of the methods in qualitative research. This research used the case study research design and purposively sampled two schools as cases. A case study is “an exploration of a bounded system or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context” (Creswell, 1998:61). Yin (2009: 19) assert that a case study is ideal when researching a current issue in depth and within its real-life setting.

The case study method allows a researcher to examine data in depth in a specific context. Most of the time, the approach chooses a small geographic area or a small number of people to analyse. Case studies entail a deep contextual investigation of a small number of events or conditions, as well as their linkages, to explore and investigate current real-life phenomena. Yin defines the case study research method

“as an empirical inquiry that investigates a contemporary phenomenon within its real life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (1984:23). When using a case study design, keep the following in mind:

- the focus of the study is to answer “how” and “why” questions
- you cannot alter the behaviour of persons involved in the study;
- you want to cover contextual factors because you believe they are significant to the phenomenon under study; or
- the boundaries between the phenomenon and context are not obvious (Yin, 2003).

A researcher can use a single-case or multiple-case design depending on the problem at hand. The researcher can use the single-case design if there are no other examples available for replication. A single-case approach has the problem of being unable to provide a generalizing conclusion, especially when the events are rare. Triangulating the study using different methodologies to confirm the validity of the procedure is one way to cope with issue. Through replication rather than sampling reasoning, the multiple-case design can be used with real-life situations that demonstrate several sources of evidence (Zaidah, 2007: 2). Theoretical rather than population-based generalization of outcomes from case studies, whether single or many designs, is based on theory (Yin, 1994). Multiple-case design strengthens and reinforces prior results by duplicating the case through pattern-matching, a technique that links various bits of evidence from the same instance to some theoretical statement (Campbell, 1975). To ensure that a case study produces the desired findings, it is critical to ensure that it is carefully designed.

The schools for this study were selected from two provinces, Gauteng and KwaZulu-Natal. One of the schools is from a rural area, the reason being to provide the research with a greater scope of different experiences from areas with different socio-economic situations. Anecdotal evidence suggests the chances of finding IKS such as ethnoastronomy; health care practices and environmental strategies in the rural area is also higher than it would be in urban areas, and this will be explored in this research.

This could be due to the challenges that people in rural areas face as opposed to urban areas which then requires sustainable methods to survive. There has been some research that supports this, For instance, an ethnographic study conducted with Zulu culture Custodians which raises issues of IKS practices as seen in the daily lives of African-Zulu indigenous-rural communities in KwaZulu-Northern Natal's (Kwangwanase, Newcastle and Greytown), Central (Valley of Thousand Hills) and Southern (Port Shepstone and Ixopo) districts, shows that the chances of finding IKS in rural areas are higher. The data from fieldwork in this study was gained from their daily experiences and concerns and served as the foundation for developing a narrative framework in IKS of knowing as learning, understanding, transmission and wisdom, based on a multilogical theoretical perspective (Govender, Mudaly & James, 2013:159). Because subsistence farming is the norm in rural areas, understanding grain sowing and the proper use of seeds (sorghum, maize, pumpkin, calabash and so on) for beverage-making and as a daily source of food necessitates knowledge of planting, harvesting, preservation and storage (Alcock 2010), knowledge that is critical for survival during seasonal droughts and winter months.

Bryant (1967) states that traditional beer is a significant part of Zulu culture, particularly in ancestral worship and it also serves as a beverage for visitors. The method of brewing beer is an old traditional one that is used by the majority of Southern African tribes (Elliott 1978:129). Brewing processes have been adapted in several regions to suit the grain species that grow in the local climate (Bryant 1967:274-275). Food storage in rural places without power remains a challenge and inventive methods of preserving and storing food have evolved through decades. (Govender et al, 2013:167). These are just some of the examples of IK in rural areas and how their experiences and challenges might mean that we find IKS more in rural areas than in urban areas, this is however not to say that one cannot find IKS in urban areas.

In order to select the schools, the researcher firstly identified areas that were easily accessible where the research can be done. This were areas the researcher could easily travel to, the areas in which the researcher would not have problems communicating, i.e., the researcher must be fluent in the language of the area. In the case of the areas chosen, IsiZulu was mostly fluently spoken by all the educators that

formed part of the study. After having selected the area, primary schools in each area were identified and contact details using the DBE website collected. Principals of the schools in the area were contacted by the researcher and asked whether they are incorporating IKS in the curriculum or if they wish to do so in the near future. From this school contact, the researcher was able make a decision on which schools to use in the study, based on availability, accessibility and expected contributions to the research.

Types of case studies identified by Stake (2000) include:

Intrinsic Case Study: is when the researcher is personally invested in the case. It is conducted because the researcher's primary and sole goal is to gain a deeper understanding of this particular case. The goal is not to comprehend some abstract concept or generic phenomenon.

The term "instrumental case study" refers to a circumstance in which a specific case is investigated in order to gain insight into a problem or construct a generalization. The case is of secondary importance, serving as a supporting element that aids our comprehension of anything else. The case is examined in depth, the context is examined and the day-to-day activities are described, but all of this aids the researcher in pursuing the external interest.

Collective case studies: When a researcher examines a number of examples in order to research a phenomenon, this is referred to as a collective case study. This strategy was chosen since it is expected to result in a better understanding and possibly better theorizing of the phenomenon (Stake 2000, cited in Naidoo, 2010:99)

Case studies can be divided into numerous categories. Yin (1984) mentions three types of case studies: exploratory, descriptive and explanatory case studies. First, exploratory case studies look into any phenomenon in the data that piques the researcher's interest. The goal of descriptive case studies is to characterise the natural processes that occur within the data. The goal of the explanatory case studies is to

study the data closely on both a surface and a deeper level in order to explain the data's phenomena. (Zaidah, 2007:3).

This study is:

- Explorative Exploratory research aims to define problems, clarify concepts and develop hypotheses. A literature search, a focus group discussion, or case studies can all be used to begin the exploration process. When conducting exploratory research, researchers look for people who are knowledgeable about a subject or process. The majority of data from exploratory investigations will be qualitative. Brainstorming sessions and interviews are just a few examples and surveys (Sue & Ritter, 2012:2). This study is explorative in the sense that it is seeking to discover knowledge about the indigenous knowledge systems and practices in the certain selected schools in South Africa by a conducting focus group and interview as well as going through literature.
- Descriptive studies typically include one or more guiding research questions, but they are not typically guided by defined study hypotheses. Because the goal of this form of research is to describe population characteristics using data acquired from samples. Descriptive research data can be either qualitative or quantitative (Ritter & Sue, 2012: 2). This study is descriptive because of the description of concepts and ways in which indigenous knowledge systems can be preserved for future generations to learn about using the school curriculum.
- Explanatory research's main goal is to explain why things happen and anticipate what will happen in the future. These investigations are distinguished by study hypotheses that specify the nature and direction of the correlations between or among the variables under investigation. (Sue & Ritter, 2012:2). The research is also explanatory, showing how the education system can incorporate indigenous knowledge systems in schools.

4.4 DATA COLLECTION

Data is a very important component of research; it is basically the raw input used to conduct research. It is equally important to ensure that the data used is of quality and credible, this entails using appropriate data sources, data collection techniques as well as suitable data analysis and interpretation processes. Data collection is the systematic process of acquiring and evaluating information on variables of interest in order to answer research questions, test hypotheses and assess outcomes. This aspect of research is present in all fields of study, including the physical and social sciences, the humanities and business. Regardless of the approach used, the emphasis on ensuring accurate and honest data collecting remains the same. The purpose of any data collecting is to obtain high-quality evidence, which can then be used to conduct rich data analysis and generate convincing answers to the questions that have been addressed.

Accurate data collecting is critical to sustaining the integrity of research, regardless of the subject of study or choice for defining data, whether quantitative or qualitative. The proper selection of data collection tools, as well as properly defined instructions for their proper usage, lower the likelihood of errors (Kabir, 2016:202). In choosing the appropriate method for the study, a process of reviewing all the available methods was undertaken, taking into consideration the pros and cons of each method. It was also essential to comprehend what type of data we want to collect and what the study is hoping to achieve with the data.

Other important considerations were the timeframe of doing the study and availability of participants as well as availability of resources such as transport and data for communication. The design of proper data collection tools such as the focus group discussion schedule and interview schedule were important for the study to ensure credibility of data. The focus group and interview scheduled were compiled in a manner that when one looks at them, they can see, the dates, times and how long the sessions would be. The questions were formulated such that they encouraged participation and sparked dialogue, instead of back-and-forth question and answer.

Also having important clear forms such as the consent forms and attendance forms was very important. Follow up and providing feedback to participants was one way of reducing the likelihood of errors occurring in data collection. It was also important to indicate whether interviews were structured, -semi-structured or unstructured, also outlining whether questions are open-ended or close-ended. This ensured the correct use of the data collection instruments.

4.4.1 Data Sources

Primary and secondary data are the two types of data that can be categorised. Primary data is information that has been gathered from first-hand experience. This is information that has not yet been published and is therefore more trustworthy and authentic. Because the data has not been edited or manipulated by humans, it has a higher level of validity than secondary data. Although research can be conducted using only primary data, research using only secondary data is often less credible and may contain biases due to the fact that secondary data has already been altered by humans. (Kabir, 2016:204). Sources for primary data include:

Experiments: these necessitate a man-made or natural location in which to conduct a logical research and collect data. Experiments are more suited to medical, psychological and nutritional research, as well as other scientific studies. In experiments, the individual conducting the experiment must maintain control over the impact of any irrelevant variable on the outcomes.

Survey: this type can be conducted in varying methods. They can be administered in person and even online. A questionnaire is the most widely utilised survey method. Questionnaires are a set of open-ended or closed-ended questions to which respondents must respond. They can be conducted over the phone, by mail, in person in a public place or in an institute, via electronic mail or fax and in other ways.

Interview: A face-to-face conversation with the responder is used in this method. When a responder intentionally hides information during an interview, the major issue occurs; otherwise, it is a rich source of information. The interviewer can not only record the

remarks made by the subject, but also examine his body language, expressions and other responses to the questions.

Observations: this can be done with or without informing the subject of the study that he or she is being watched. Observations can be carried out in both natural and intentionally constructed environments. 205 (Kabir, 2016)

This study utilised both primary and secondary data sources. Primary sources include the data generated from participants in the interview process and focus group discussions. The interview was conducted with an official from DBE. The interviews were transcribed afterwards, and the transcripts used.

Secondary data is information collected from a source that has previously been published in some manner. Secondary data is information obtained by another person (researchers, recognised organizations acceptable to a system, etc.) for records or a purpose other than the one presently being considered, or a mix of the two (McCaston, 2005). Secondary data analysis, according to Hakim (as cited in Johnston, 2014), is any further analysis of an existing dataset that presents interpretations, conclusions, or knowledge that is different from, or additional to, those presented in the first report on the inquiry as a whole and its main results.

Any literature review is based on secondary data. Censuses, organizational records and data obtained through qualitative techniques or qualitative research are the most prevalent sources of secondary data in social science. Secondary data can be found in:

- Books
- Records
- Biographies
- Newspapers
- Published censuses or other statistical data
- Data archives
- Internet articles
- Research articles by other researchers (journals) □ Databases, etc. (Kabir, 2016:205)

In terms of secondary data, this study used documentary research which uses a literature review to evaluate academic and research-based work, as well as documentary analysis to acquire data from existing records without having to interview people or fill out questionnaires. or simple observation.

Relevant published scholarly texts on indigenous knowledge systems were chosen as secondary sources; Scientific journal articles, reference works and newspaper and magazine reporting; Internet-based resources as well as Legislative frameworks in South Africa that are relevant; Published and unpublished documentation, research reports and documents of case studies that have incorporated IKS in the school curriculum.

4.4.2 Data collection techniques

Most qualitative data is non-numerical and descriptive in character. This indicates that the information gathered is in the form of words and sentences. Feelings, emotions, or subjective perceptions of anything are captured in some circumstances by such data. Qualitative approaches seek to understand the 'how' and 'why' of something and are more likely to use unstructured data gathering methods to do it. Typically, the queries are left open-ended. Focus groups discussions and interviews are among the approaches used. Qualitative data collection methods are crucial in evaluating impact because they provide information that may be used to better understand the processes that lead to observed results and measure changes in the perceptions of people. In addition, by assisting in the generation of evaluation hypotheses, refining the design of survey questions and broadening quantitative evaluation findings, qualitative approaches can be used to improve the quality of survey-based quantitative assessments. (Kabir, 2016:202)

The qualitative methods most used can be organised in three broad categories namely In-depth interview, Observation methods and Document review. The study used the focus group discussion and semi structured interview methods which can be placed under the category of in-depth interview. The methods are explained in detail below:

4.4.2.1 Focus groups

A focus group is an organised group discussion about a certain topic for research purposes. A researcher who serves as a facilitator and moderator guides, monitors and records the conversation. Focus groups are used to gather information about people's collective opinions and the meanings they have. They're also helpful for gaining a deeper insight of people's experiences and ideas. Focus groups can be used as a standalone approach for study into group norms, meaning and processes, according to suggested criteria. They can also be utilised as part of a multi-method approach to investigate a topic or capture group language or narratives for later use. Finally, they can be used to provide feedback to research participants by clarifying, extending, qualifying, or challenging data gathered through other methods. Gill, Stewart, Treasure and Chadwick (2008) (Gill, Stewart, Treasure, & Chadwick, 2008:29).

This study employed a facilitated group discussion, with questions that are open ended used to facilitate the conversation and to allow for various perspectives and opinions. The answers are categorised and arranged thematically. This method was chosen because it increased the chances of getting a number of varied opinions and not make the study biased. The method also helps generate further questions to be addressed through the discussion as people come up with follow-up questions. The researcher purposively sampled the educators to partake in the study depending on their knowledge of the subject matter and also chosen because of different experiences. Participation was voluntary and based on informed consent. No coercion was applied in getting participants for the focus group.

4.4.2.2 Interviews

The aim of a research interview is to gain insight on people's perspectives, experiences, opinions and /or motives on various topics. These methods, like other qualitative methods, are believed to offer a "deeper" knowledge of social processes than strictly quantitative means like questionnaires. When not much is known about the research phenomenon or when precise perceptions from individual participants

are required, interviews are appropriate. They're also good for delving into difficult topics that people might be hesitant to discuss in a group setting (Gill et al, 2008:292).

Structured, semi-structured and unstructured research interviews are the three primary categories. Structured interviews are basically orally administered questionnaires through which prepared questions are asked with not much flexibility or room for follow-up questions to allow for further explanation. They're relatively quick and simple to use. They, on the other hand, only allow for a limited number of participant responses and, as a result, are of little utility when greater depth is required. The unstructured interviews are conducted with little or no organization and do not reflect any predetermined notions or concepts. This form of interview, which may simply begin with an opening question, is typically very time-consuming and difficult to manage and engage in because there are no pre-determined interview questions to provide minimal guidance on what to discuss. They can be utilised in situations where little is known about the issue (or a different perspective of a known subject area is required). A semi-structured interview consists of several essential questions that help to establish the areas to be investigated, but also allows the interviewer or interviewee to diverge in order to pursue an idea or response in greater depth. The flexibility of this type additionally enables for the discovery or development of material that is essential to participants but may not have been considered to be relevant by the study team previously. (Gill and colleagues, 2008, p. 291)

When creating an interview schedule, it's critical to ask questions that will yield as much information about the study region as feasible while simultaneously addressing the research's objectives. Questions that are regarded as effective in a qualitative interview are open-ended, needing more than a yes or no answer; they are neutral, sensitive and intelligible. To put respondents at ease and establish confidence in replying, it's usually preferable to start with questions that they can readily answer before moving on to more difficult or sensitive issues (Gill et al, 2008:292).

An interview for this study were conducted with a programme director from DBE that has been tasked with curriculum development or works within the division that deals with IKS. To select the appropriate participant, assistance was requested from a third

party within the DBE who may authorise participation to nominate potential participants. From this list, the researcher purposively sampled the most relevant participant. The interview was semi-structured to also leave room for more perspectives and additional suggestions that the interviewee may need to add. Participation was also voluntary and based on informed consent, with no coercion being applied.

4.5 SAMPLING TECHNIQUES

Maseko (2019:100) cites Latham, who defines a sample as a "sub-group" of a population or a "taste" of a group. The sampling technique involves choosing a representative sample of the population and utilising the information gathered as research data. It is critical that the sample be representative, meaning that the characteristics of the sampled units are similar to or comparable to those of a known number of units in the population (2007:2). The process of selecting a suitable representative portion of a population in order to determine parameters or features of the whole population is known as sampling (Mugo 2002: 1).

Purposive sampling is used a great deal in qualitative research (Babbie, 2017). Qualitative, theoretical, non-probability, or judgment sampling are all terms used to describe these sampling procedures (Teddlie & Yu 2007). Purposive sampling is the deliberate selection of specific individuals, events, or locations based on the valuable information they can supply that cannot be gained through other means (Padgett 2017). Patton asserts that

'the logic and power of purposeful sampling lie in selecting information-rich cases for study in depth' (2015: 264).

Maximum variety sampling, also known as heterogeneous sampling, is a purposive sampling approach for obtaining a diverse range of opinions on a topic of interest. It's a quest for a wide range of viewpoints, from the commonplace to the outlandish. The units of interest to the researcher (i.e., persons, cases/organizations, events and bits of data) are referred to as conditions. These units can exhibit a wide range of

characteristics, behaviours, experiences, episodes, qualities and situations, among other things. Maximum variety sampling is based on the idea of gaining a better understanding of a phenomenon by looking at it from all sides (Laerd Dissertation, 2012).

Another technique of sampling is convenience sampling, which is also known as Haphazard Sampling or Accidental Sampling. It is a form of nonprobability sampling in which individuals of the target group who meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a specific time, or willingness to participate are included. It can also include people that are conveniently accessible to the researcher. These samples are often referred to as 'accidental samples,' since items may be chosen in the sample purely because they are situated near where the researcher is collecting data, either physically or administratively (Etikan, Musa & Alkassim 2016: 2).

Another non-probability sampling approach is snowball sampling. This strategy is ideal, according to Babbie, when some individuals are difficult to locate, such as migrant workers and homeless people. Snowball sampling involves data collection of a few individuals of the targeted population who the researcher can find and then requesting those members to supply information needed to locate other members (2014:200).

Purposive non-probability sampling was employed in this research. The maximum variation sampling approach entails picking candidates from a wide range of backgrounds related to the research issue (Etikan et al, 2016:3) was used for selecting the sample for the focus groups. The teachers selected had different experiences from each other, depending on what grades they teach, what subject they teach and how much knowledge of the IKS subject matter they are exposed to. This was to ensure that we receive different views of the community instead of just a one side angle of people's opinions and preferences. The convenient sampling method was also utilised. In this case, this method was useful because in choosing the teachers and

also the DBE representative, the study had to consider issues of availability and also willingness to participate in the study.

4.6 DATA ANALYSIS AND INTERPRETATION

Another important step in research has to do with the analysis of data and how the data gathered is interpreted. The growth of qualitative research in many areas such as health, social sciences and psychology makes it vital for researchers to be familiar with qualitative data analysis. According to Hatch, a researcher's mastery of qualitative data analysis is critical to their systematic search for meaning in their data (2002:148).

Qualitative data analysis helps researchers make meaning of their qualitative data, it is one of the most crucial processes in the qualitative research process. (Leech & Onwuegbuzie, 2007). Qualitative research produces “large amounts of contextually laden, subjective and richly detailed data” (Byrne, 2001:904), this means that data analysis can take up a lot of time during the research process. Searching, evaluating, identifying, coding, mapping, exploring and describing patterns, trends, themes and categories in raw data in order to interpret and reveal their underlying meanings is what qualitative data analysis is all about (Ngulube, 2015:1). It's also worth noting by researchers that:

“all forms of qualitative data analysis involve interpretation and they must always acknowledge the possibility that alternative interpretations are possible” (Harding, 2013:139).

In qualitative research, some of the ways in which that is interpreted includes coding and thematic analysis. Qualitative researchers frequently use the terms codes and themes interchangeably. Thematic analysis is the most extensively utilised data analysis method (Braun & Clarke, 2013:175). Grounded theory, framework analysis, interpretative phenomenological analysis, critical ethnography and template analysis are examples of thematic data analysis procedures (Madill & Gough, 2008). Coding as a notion in qualitative data analysis was initially developed in the 1960s. The term "thematic analysis" refers to:

“A method for identifying themes and patterns of meaning across a dataset in relation to a research question...” (Braun & Clarke, 2013:175).

The interviews in this study were recorded by audio device after informed consent was obtained, then transcribed by the researcher. After all the interviews had been transcribed, they were sent back to the participants to verify that their responses have been captured correctly and for interpretation. The responses from the focus groups were then organised in themes.

4.7 TRUSTWORTHINESS

Rather than employing traditional tests of trustworthiness such as validity, reliability and objectivity, which are central to quantitative research, the qualitative research design assesses trustworthiness through credibility, transferability, dependability and confirmability. Member-checking, stepwise replication and audit trails are examples of trustworthiness standards that strive to authenticate the contents of what participants said, objectivity from the researcher. Member-checking aids in the validation of qualitative research findings by returning themes and descriptions to participants to see if they believe they are correct. Peer briefing and the involvement of external auditors are used to improve a study's credibility by determining whether the findings resonate with people who aren't involved in the study (Lincoln & Guba, 1985). These factors work together to promote objectivity, ethical diligence and rigor. (Jackson, Drummond & Camara, 2007:26).

The four criteria identified by Lincoln and Guba (1985:112) for establishing trustworthiness include:

- Credibility, which is proved when individuals recognise the findings of the study as their own (Streubert & Carpenter, 2003:38). Long-term participation, reflexivity, triangulation, peer and participant debriefing and member checks can all help to establish credibility (Badugela, 2019: 107).

- Transferability, also called as fittingness, relates to the likelihood that the research findings will have relevance for others in a repeated situation (Streubert & Carpenter, 2003:39). The intended user, not the researcher, determines whether the findings are transferrable, according to Streubert & Carpenter (2003:29).
- Dependability is also used to measure trustworthiness. It is met through ensuring credibility of the finding, this means that there cannot be dependability if credibility has not been met (Streubert & Carpenter, 2003:38). It has to do with the consistency of the findings, which means that if the study was replicated in a comparable setting with the same individuals, the results would be the same (Holloway, 2005:143).
- Confirmability is realised if a study demonstrates credibility and fittingness (Lincoln & Guba, 1985:143). It refers to the data's objectivity or neutrality. This indicates that the results are not skewed. The goal of confirmability is to establish that the facts and thought processes lead to the same conclusions as in the research environment for another researcher. (Badugela, 2019:111)

The researcher ensured trustworthiness of the study, by ensuring its credibility. To achieve this, openness in how participants have been selected was ensured to provide transparency. The data collection methods and recording of interviews and focus group discussions increased credibility of findings and limited bias from the researcher. Recordings took place after explicit consent by participants was obtained. The researcher made sure that the participants were clear on the nature of the research i.e. its purpose, their role etc. Trust needed to be built by the researcher. By conducting the study in the environment of the participants it created an ease for the participants. The researcher also shared their personal, academic and professional background with the participants. Participants were provided with communication channels to reach the researcher when there was any doubt about the conduct of the research or its purpose. Purposive sampling increased the chances of transferability of the research. Various literature sources were used for the research, which aided in triangulation. Even during data interpretation of the responses, the researcher, used

further secondary sources to supports, statements made during focus group discussions and the interview, in order to support the findings and validate information provided.

4.8 ETHICAL MEASURES IN QUALITATIVE RESEARCH

In any kind of research, one is likely to come across ethical issues. It is important to know the issues related to one's study and put measures in place to deal with them. Ethics in a nutshell relates to doing good and avoiding harm. There are certain appropriate principles that can be applied to prevent or reduce harm when conducting research. This section will discuss some of those principle. The protection of humans or participants in any research study is critical. Ethical issues in qualitative research are often complicated and distinct from those in quantitative research. In qualitative research, data is gathered primarily through interviews, observations, written materials and audio-visual material. Access to participants in order to gather data must be negotiated; consequently, the quality of social relations between researchers and participants may help or deter access to information (Orb, Eisenhauer & Wynadenand 2000:94). Despite having been granted access and taking the first steps toward data collection, researchers may still face ethical difficulties that were not foreseen in the outset.

Ramos identifies three categories of issues that can impede qualitative research (1989). To begin, there is the researcher-participant relationship. The researcher's subjective interpretations of data come second, followed by the design itself. Disclosure, trustand awareness of potential ethical difficulties will all benefit from a balanced researcher/participant interaction. (Orb et al, 2000:94)

Some of the ethical challenges in qualitative research can be alleviated by understanding ethical principles such as autonomy, beneficence and fairness. According to Capron (1989), any type of study should be led by the principles of respect for people, beneficence and justice. Respect for people is achieved by recognising participants' rights, such as the right to be informed about the study, choose without cohesion whether or not to take part in it and the right to withdraw at

any time without penalty. This principle is ensured in a qualitative research project via informed consent (Kvale, 1996).

Beneficence is a second ethical concept that comprises doing good for others and avoiding harm. The researcher has a moral obligation to uphold the concept of beneficence by having oversight of the potential implications of divulging participants' names. Using pseudonyms is a good method to go about it. In cases where this isn't possible, the study's distribution may need to be restricted to safeguard people's identities. Participants should also be made aware of how the results will be disseminated. Legal requirements, such as when researchers' data is subpoenaed for legal purposes, might compromise confidentiality and anonymity. Participants should be reminded that if legal reporting is required, such as in cases of child or elder abuse, this information will be kept confidential and anonymous. Confirmability is also required in qualitative research, which means that all activities in a study must be documented (Orb et al, 2000:95).

The principle of justice, which refers to an equal sharing and fairness, must also be enforced in qualitative studies. This principle prohibits participants from being exploited or abused. The recognition of the vulnerability of the participants and their contributions to the study indicates that the researcher is aware and applies the principle of justice in qualitative research (Orb et al, 2000:96).

Firstly, to ensure that the study was conducted ethically, the researcher ensured that the ethics of informed consent, confidentiality, integrity and honesty were conformed to as well as the university's rules regarding plagiarism. The ethical principles were observed, ensuring that informed consent forms are detailed in explaining to the participants their rights of anonymity, confidentiality, voluntary participation and any expected benefits or harm. Permission letters were obtained from the Gauteng Department of Education and the KwaZulu-Natal Department of Education to conduct research at one of their schools as per their prescribed requirements. A permission letter was also obtained from the DBE to conduct an interview with one of the directors in the appropriate department. Permission was obtained from the schools chosen

through the principals and participants to conduct research within the chosen area. The use of consent forms guaranteed the anonymity and confidentiality of participants.

Additionally, the researcher ensured that all relevant IKS documents in South Africa such as the IKS Policy of 2004, Protection, Promotion, Development and Management of Indigenous Knowledge Act 6 of 2019 and Indigenous Knowledge Systems Research Ethics Policy (DST, 2015) were reviewed to ensure that research is undertaken in accordance and in line with the guidance of legislation. Additionally, the researcher ensured protection from harm to participants by abiding to the COVID-19 regulations of the South Africa, maintaining social distance, sanitising and wearing masks. Language is an important factor when conducting IKS research, in this regard, the participants were given the option to respond in their preferred language of communication which the researcher would have translated when transcribing.

4.9 CONCLUSION

In research, it is essential to have a plan on how the study will be carried out. This provides direction for the researcher and the tools to ensure that the stated research questions are answered accordingly. The research methodology maps out the researchers plan on carrying out the study. In this chapter, the key elements of a research methodology were discussed. After highlighting the research paradigm, the next step was to determine what the research design of the study will be, this gives basis on the choices of the techniques that are chosen for data collection, sampling and ethical considerations. This study is a qualitative study, which uses the case study approach elaborated upon in this chapter too. Data collection was discussed, focusing on techniques, sources and interpretation. The sampling methods suited for this type of study were also indicated. The issue of trustworthiness which is important was also a point that formed part of this chapter.

CHAPTER 5

DATA PRESENTATION AND DISCUSSION

5.1 INTRODUCTION

This chapter presents and discusses the data and the themes that emerged from the study. The chapter will begin by providing sample profiles of the two primary schools for the case study undertaken. The data are presented, firstly by analysing the semi structured interview conducted with the DBE representative. Secondly, data from the focus group discussions conducted with the educators at School A and School B are presented to indicate their different experiences in incorporating IKS in the curriculum. The chapter will present the key themes that have emerged in this study through the data collection and analysis.

5.2 DATA ANALYSIS FOR THE STUDY

There are several analysis methods available to analyse qualitative data in research. It was important to choose the most suitable for this study to ensure that the presentation of the data provides a clear picture of the findings. This study used a combination of the content, narrative and discourse analysis methods to interpret the data in order to answer the research questions. Content analysis was used when reviewing the text from the Curriculum and Assessment Policy Statements (CAPS) and other curriculum statements, the narrative analysis was used in analysing the data collected from the interviews and focus groups. The narrative analysis method was also employed during the focus group discussions where the researcher also observed the educators in their social contexts. The analysis methods were overall descriptive and interpretive. Descriptive analysis involved organising the data into the following categories, teaching experience, grade and subject taught while interpretive analysis involved content analysis which provided information on exploring the viability of incorporation of AIKS into the basic education, the data collected was interpreted and the information was then organised in themes.

5.3 SAMPLE PROFILES: CASE STUDY SCHOOLS

5.3.1 School A

School A was established in 1963. When it was started, the school was a junior primary school starting from Sub Sub A to standard 2 with only handful number of teachers. According to the principal, from its inception, it was a very successful and disciplined institution. It was the beacon of the entire community.

School A principal 'Our institution was well rounded as it equipped learners in all spheres, such as culture, academic and to a certain extent the sports. Fortunately, we excelled in most of the activities that we participated in'.

Currently the school starts from grade R to grade 7. Each grade has 3 classes and there are 25 dedicated educators including the practitioners. Amongst the staff there is also one principal, a Deputy principal and four Head of Departments (HODs).

School A principal 'We are fortunate that we benefit in feeding scheme plus scholar transport'.

The school falls under the ordinary school category. In South Africa, the public and private schools are collectively known as ordinary schools and make up approximately 97% of schools in the country (Mhlana & Moloi, 2020:3).

5.3.2 School B

School B is a public state primary school located at, Bergville, KwaZulu-Natal Province, South Africa. It is classified under quintile 3 as a no fee institution. According to the principal, the school was established in 1961 by Missionaries from Holland. Two mud classes were built in the vicinity of the Dutch Reformed church. In 1979 the DoE rendered assistance by building 9 classes, administration block and ablution block. Currently, the school starts from Grade R to 7. It has a satellite site with 3 mud classes built by the Methodist church 5 kilometres away from the main school. The total number of learners at both sites is 415. Average number of learners per class is 30.

There are 11 permanent educators, due to the shortage of educators, 6 educators work as volunteers.

School B principal: 'Apart from the shortage of educators, another challenge is that there are no administrative clerks, cleaners and security guards. This makes it impossible to capture the South African School Administration and Management System (SA-SAMS). The school also faces accounts of burglary and school vandalism at times'.

5.4 SEMI-STRUCTURED INTERVIEW ANALYSIS

The semi-structured interview for this study was conducted with a representative from the DBE. The role of the participant is crucial in the department, because they work in a Directorate that provides curriculum specialist support to the Inclusive Education Directorate. There are curriculum standards and principles that need to be set for all subjects in curriculum development. The specialist in Arts education provides the perspectives of the arts and the requirements of the tools and standards for implementation of arts education in the curriculum. As IKS is one of the principles that have been set out in the curriculum policy, Arts education is one of the vehicles that are used for IKS implementation, as it is required for all subjects to do so. According to the participant,

'Creative Arts, as a subject in the General Education and Training (GET), lands itself naturally to the instruction of indigenous dances, music, visual artworks and drama'.

The semi-structured interview was conducted in October 2020, through a virtual call due to the hard COVID-19 lockdown regulations which restricted contact at the time. The interview was an hour long, in which the researcher asked some questions from the schedule and the representative also gave additional information in relation to the subject. The purpose of the interview was to ascertain to what extent has there been work done by the department in ensuring that IKS is incorporated into the basic education curriculum.

5.4.1 Role of DBE in IKS incorporation at schools

The role of DBE has been thus far that of ensuring that there is policy that underpins the inclusion of IKS in the curriculum. This has been done through the inclusion of this requirement in the CAPS. The interview was also meant to find out whether over and above the pronouncement of the importance of IKS in CAPS, there has been any other role that the DBE has or is currently playing in to ensure that inclusion of IKS is achieved at schools.

Researcher: Knowing that IKS has been made a requirement in the curriculum, did DBE set any targets as to the roll out of Incorporating IKS in schools as per CAPS requirements? If so, how were targets set, where can I get such information?

DBE Representative: IKS is not a stand-alone concept as far as curriculum implementation is concerned. It is part and parcel of the DNA of curriculum design and content mapping across Grades. There would be no time frame and target of rolling out IKS as if it is an add-on of the content of curriculum. IKS cannot exist parallel to curriculum content and therefore cannot have isolated targets outside the curriculum implementation targets.

The response was that the department makes it a requirement to include IKS but it is the educators who are at liberty of ensuring how this may be done in their classrooms. There is usually no specification on how an educator in their lesson plan must include IKS and which IKS must be included. There is also no prescribed material from DBE that relates specifically to IKS that is provided to educators. There is no unit that is explicitly dedicated to the incorporation of IKS in schools, there are no targets that says how many schools must be incorporating IKS and by when.

Researcher: So has the department captured any Data on the schools that have begun with the process of incorporating IKS? Where is this data stored? If not, how is progress on IKS in education monitored?

DBE Representative: Schools do not implement IKS as an isolated programme. It can never be a programme on its own outside the ambit of curriculum content. As a principle, it is a transversal principle. There is no isolated content called IKS. What exists are curriculum topics that must infuse IKS as it draws content and examples in various subjects and further find relevance and instructiveness in the immediate context of the schools as teacher methodology seeks to establish relevance and cultural currency.

Researcher: finally, is any more information you can share that would assist the research relating to the incorporation of IKS in school curriculum especially at a primary school level?

DBE Representative: The importance of the Constitution in curriculum development remains obligatory in order to ensure that the knowledge, values and skills link to democracy and constitutionalism. Conduct must not be inconsistent with the Constitution.

It is important to also know that teaching is a professional space and there is the South African Council for Educators (SACE). Culture bearers, IK bearer are important to inform teachers of the areas of content that they require additional knowledge on. They can participate in extra curricula sessions that support teaching and learning. If recruitment processes are managed properly, the SGB may motivate to SACE the role culture bearers are identified to play in teaching and learning and a temporary SACE certificate may be secured for them, as long as SACE requirements are met. Without such formalities complied with, culture bearers may only participate in extra-curricular programmes intended to support core curriculum programmes, in line with SACE standards for the Teaching Profession.

Culture bearers who contribute their knowledge and skill in education may not be equipped with different methodologies teachers are trained on. It is interesting that the culture bearers in the community are able to teach different learners who learn differently through indigenous mythologies. Teachers, in their training are also taught inclusive teaching and learning methods that require sensitivity to multiple

intelligences in classroom management and teaching in order to be able to teach different learners who learn differently.

Also important remains the inclusion of IKS content in the textbooks, is managed right from the onset. The criteria for evaluating Learning and Teaching Support Material to ensure the inclusion of IKS under the section called “Values in Education”. Care is taken on the terminology, images, illustration, names of people and places, nonstereotyping, etc” in the content of such material. IKS compliance is one of the values that the evaluation of such material does not compromise on. These criteria must comply with the inclusive values of democracy which are human dignity, the achievement of equality and the advancement of human rights and freedoms; nonracialism and non-sexism.

5.4.2 Programmes by DBE for the incorporation of IKS into the school curriculum at primary school level

With regards programmes that are in place that are geared at the incorporation of IKS in schools, what came out from the interview was that there are currently various informal programmes by DBE that promote IKS in schools.

Researcher: Are there any programmes that have been put in place by DBE for the incorporation of IKS into the school curriculum at primary school level? If yes, what are those programmes, if not, what is the reason for not having programmes on the area of IKS.

DBE Representative: Yes, we do have informal programmes in place, firstly the School Enrichment Unit which is located at the DBE, co-ordinates a school based curriculum enrichment programme in schools. The School Enrichment Directorate is able to work transversally with schools and communities in order to activate social cohesion in a manner that strengthens the work of curriculum managers and teachers at school level

Another programme that is geared towards supporting IKS activities at the school level is the ABC Motsepe South African Schools Choral Eisteddfod (SASCE), which is one of DBE's most vital cultural events on the yearly school calendar. The purpose of the contest is to improve the singing talents of the country's learners through different stage performances and music. The aim of the programme is to address entrenched the cultural, traditional and indigenous messages, that work in promoting nation building and the promotion of national identity. Music, as with other ways of cultural expression, is regarded as an important weapon of education (South African Government, 2019).

Although the participant shared some programmes during the interview, including the above and indigenous games, the researcher went to search on the department's website for any other programmes that the participant might have left out. For example, the DBE went into partnership with the University of Venda (UNIVEN) to host the Indigenous Languages Spelling Bee Championship at the University of Venda's main campus on 28 November 2019. This program is a contest that all SA schools can participate in and encourages learners of various backgrounds to improve their reading and writing skills in the intermediate phase. The partnership is between DBE, the Department of Arts and Culture (DAC), UNIVEN, the South African Broadcasting Corporation (SABC) Education, AVBOB Foundation and National Education Collaboration Trust (NECT) to enhance the overall quality of competition. The learners were divided into four language groups namely, Sepedi, Xitsonga, TshiVenda and SiSwati (DBE,2019).

5.4.3 Support by DBE to educators in incorporating IKS

The DBE representative agrees that the department needs to support educators in incorporating IKS because it is them who are key to the implementation of this goal and without support from DBE, the attainment of inclusion of IKS in the curriculum as also expressed in CAPS might not be realised. This can be seen in his response

Researcher: in terms of supporting educators, what measures have been put in place to support teachers?

DBE official: The department makes sure that teachers are equipped professionally with the necessary skills to carry out their duties. Teacher Development is seized with that responsibility. Teacher Development and training programmes are available to teachers and these help teachers with the accumulation of the teacher development points. Teachers are guided by the enacted curriculum and policy infrastructure in the implementation of IKS. There is SACE, the professional Council for Educators. It sets the professional standards of the teaching profession through appropriate registration, management of professional development and inculcation of a Code of Ethics for all educators.

In addition, there are specific programmes for training Creative Arts Teachers as well as Life Orientation Teachers for implementing the curriculum content that is IKS compliant in the classroom. This happens through the Teacher Orientation programme as well as through Subject Committee Meetings. IKS is not a stand-alone strand of the curriculum. There cannot be a dedicated silo training on IKS when IKS as a principle of curriculum development and design requires that relevant touch points of content instruction always include IKS knowledge generation and ways of knowing (ontologies). Even though the curriculum sets the minimum standards for education, teachers are also encouraged to rely on their professional judgement as they provide further IKS content and draw from the knowledge embedded in the cultures of the communities in the geographic context of the school. For example, in choosing methods and aids, they should move from the known to the unknown.

5.5 FOCUS GROUP DISCUSSION ANALYSIS

There were two focus group discussions conducted in the study. One was in School A and consisted of five participants in total. This discussion was held on the 04th of August 2021. Details of educators who participated are as follow,

Table 1: School A participant list

Participant	Grade	Subject	No of Years of Teaching Experience

Educator 1	6	English	4
Educator 2	2	Life Skills, Mathematics, IsiZulu and English	17
Educator 3	4	IsiZulu	4
Educator 4	5	IsiZulu	5
Educator 5	2	Life Skills	3

For the second focus group discussion, the researcher travelled to the rural area of Bergville in KwaZulu-Natal, to a primary school referred to as School B. The discussion was held on the 13th of August 2021. A total number of four educators agreed to take part in the study. The sample differed from the first in that mostly the educators in this focus group had more years of experience in the education field and had different socio-economic backgrounds. The difference between the two schools was also that most of the teachers from the school in the rural area were responsible for teaching more than one grade and in addition to that, were teaching more than one subject.

Table 2: School B participant list

Participant	Grade	Subject	No. of years of Teaching Experience
Educator 6	4,5,6	English and Life Skills	8
Educator 7	4,5,6,7	Mathematics	27
Educator 8	1	IsiZulu, English and Mathematics	28
Educator 9	3	IsiZulu, English, Mathematics and Life Skills	32

5.5.1 Themes emerging from experiences of educators in incorporating AIKS into the Basic Education curriculum

The aim of this study was to gain insight about the incorporation of AIKS into the basic education curriculum, this was done by looking at experiences of educators at two schools. Once the data was collected and analysed, the researcher was able to identify the key themes which are in response to the research objectives. This section identifies themes under the categories, types of AIKS, benefits of AIKS in schools, incorporation by educators, challenges of incorporating AIKS and Guidance and support for from DBE.

5.5.1.1 Educators understanding of AIKS and its value in the curriculum

The first engagement with the educators was to ascertain their level of understanding of what AIKS is. Then the goal was to get them to give examples according to their understanding and also their experiences. The data below, gives a sense of what educators think AIKS is and the level of value placed on it especially in the context of school learning.

5.5.1.1.1 Different types of AIKS that form part of teaching in the selected schools.

This section looks at the themes that emerged from the discussion about the types of AIKS that educators have knowledge of or are using in their classrooms.

(i) Indigenous games

Indigenous games are an important part of IKS in South Africa. It is noted by Mosimege (2020) that The South African Sports Commission (SASC) argued that the games were linked to “traditions of a cultural group, being of a local origin and requiring physical skill, strategy and/or chance” (SASC, 2001:3).

There are studies conducted on the subject of indigenous games and other studies on the link between games and their importance to education. In many traditional communities, it has been seen that children learn in various ways, such as free play or playing together as children, involvement in nature even by assisting adults with

their housework and chores (Black, 2012). The main goal of indigenous games and knowledge is to integrate young people into different roles in society. (Seroto, 2011). By using indigenous games and knowledge, children learn that theirs and their community's present and future depends on their understanding and preservation of the structures in their community, regulations, language and values that have been passed on from the past (Nxumalo & Mncube, 2019:105)

Some of the studies are referred to by Mosimege. Most of the studies referred to by Mosimege in the 'The use of indigenous games in the teaching and learning of Mathematics' shows that learners have various experiences linked to indigenous activities. The learner's experiences are mostly influenced and determined by the socio-cultural contexts where they interact. These consist of playing and interacting with their brothers and sisters and peers, teachings from parents, grandparents and other community members. Activities that they do daily at home and outside of home and observing other people doing various socio-cultural activities. (Mosimege, 2020:5)

In conducting the study with the educators from the different schools, it became apparent that currently the IKS that educators are trying to include in their classrooms is mainly that which they know from their childhoods at home and community. The dominant IKS that seems to be a point of reference for educators in the study was the indigenous games. Both educator 2 and educator 6 indicated their use of IKS in their Life Skills lessons, especially in their physical education study areas.

Educator 2 from School A linked her understanding of IKS to her particular experience. As a Life Skills teacher who sometimes has physical education lessons, she spoke mostly about Indigenous Games and this was also evident in her response about her understanding of IKS. She indicated that to her IKS included activities that originated from a particular cultural group, community or people, she also believed that there was value in adding IKS into the curriculum. From the use of word 'activities', one can already tell that she is basing her understanding on what she has experienced through her subject.

Researcher: So you in terms of Indigenous knowledge systems ne, when understanding that concept, what do you know about it?

Educator 2: Like mina (me) ne, ngiyithathe (I took it) as ama indigenous games and said they are activities that originated from a particular cultural group, community or people.

Educator 2: I explain the rules of the game. For example izingedo. The game improves eye-hand coordination, so the learner has to focus not to drop the stone. In the Life Skills, under physical education, I divide my learners into groups, may be a group of ten learners, each group to select a champion and compete. This is the same educator from School A, giving an example of one of the indigenous games she uses in her lessons. Educator 6 made mention of indigenous games and how they served a purpose for that community at a point in time.

Educator 6: okay mina (me) I wanted to talk about, basically the way of life, which is iculture and the way of doing things, even on a lighter note mhlambe (maybe), amagames ngendlela ebeyenziwa ngayo (games the way they were done) and those are the things that are not even written down, even though manje sesikwenza (now we are doing) and we trying to mordenise some of the things, but there were games that had purpose, that served a certain purpose, in each and every tribe, whether it's a group of people, that society ephila lapho (who live there), there were games ebemabawadlala (when they play them) for a certain purpose and benama rules (they had rules) but were not written down, obviously now there are things that we are taking from back then and have them written down even for next generation.

(ii) Traditional medicines

Traditional medicine is defined by WHO defined as a collection of knowledge, abilities and practices which is based on the philosophies, beliefs and experiences indigenous to various groups, used to sustain health, as well as to avert, diagnose, improve or treat physical and mental ailments (WHO, 2018)

During the focus group sessions with the educator, there was in more than one instance, mention of educators knowing of the use of plants for healing from home. For example, Educator 1 indicated that although at home, one did not refer to aloe vera plant as medicine, it was a plant that was used at times for healing. Educator 2 also spoke of a plant that was used when she was a child to heal her ear infections.

At School B, educator 7 mentioned how sometimes because some families might not have the means to go to health facilities, she would let a learner know what their parents can do if they are ill. For instance, she mentioned methods like enema. This shows that educators are aware of traditional medicines and practices especially from their homes and communities and that this knowledge exists. There is a case for having such as part of the knowledge to be included.

Educator 7: kunama, yini, iihlahla ezisizayo umuntu mayegula, mina nje I used to say kulezingane, mawugula nje wothi umawakho akakuchathe, that's just what I say. Ngoba vele kukude kabi ukuthi ngizathi, akwakwise e clinic, njengoba ugula manje, umzali akanamali akanalutho (there are, what, plants that help a person when they are sick, me, I used to say to these kids, if you are sick, tell your mom to give you enema, that's just what I say. Because it's far for me to say tell her to take you to the clinic when you are sick now, the parent doesn't have money, doesn't have anything)

In seeking to learn further what the educators understood of the IKS concept, the researcher further requested the participants to share some of the practices that they grew up on, either from home or the community, which they now can see that it is actually part of IK.

Researcher: Can I go a bit further on that and ask you whether, in your growing up, ukhule la e (area 1)(did you grow up here in (Area 1) or ...

Educator 2: oh no KZN

Researcher: let's say ekukhuleni kwakho ke mhlambe e KZN, yiziphi izinto ozikhumbulayo ukuthi hayi mahn, bekuwulwazi lwethu thina as icommunity (in your growing up in KZN, what are the things that you remember that we can maybe say, if you can remember, that actually man this was our knowledge as a community). Lets say me for example I grew up at home (im not saying this is the case), where there was a thing of saying if I am sick, I don't go first to the hospital, they'd say go take a certain plant and boil it....

Educator 2: bengiwumuntu ohlushwa izindlebe, so besi user this elephant bani bani bani, yabona lento bathi idlebe le Ndlovu (I was a person who used to be troubled by my ears, so we used to use this elephant something, you see that thing they call elephant's ear)

Researcher: Yini leyo (what is that)

Educator 2: ...yayazi lento, igreen mara ngase winter ibafawn, idlebe lendlovu, uthatha ulibeke estofini, libe warn kancane bese uyalifaka endlebeni (you know this thing, its green but in winter it becomes fawn, elephant's ear, you take it, place it on the stove, to warm a little then put it in the ear.



Picture 1: "Wild-Mulberry, Trimeria grandifolia ssp. grandifolia

Also known as Big Ears, Big-Leaf Trimeria, In Afrikaans it is called Grootblaarwildemoerbei, Grootblaarysterhout, Wildemoerbei, or Lindeboom. The IsiXhosa terms for the plant include Idlebe-Lendlovu, Igqabela, Umnqabane, Itabatane, Igqabi, Ilitye. They call it Idlebelendlovu in Isi-Zulu, Sicandzamatje, Mahlebe in IsiSwati and Muhasha-Phande, Mufhanza, Tshilaphithi in Tshi-Venda (Candice Gardening, 2021)

Experiences that were shared related to practices that could be linked to medicine, for instance, Educator 2 indicated that growing up, she used to have issues with ear infections but never had to go to hospital because there was a plant (Idlebe le Ndlovu) that was used, warmed and liquid poured into the ears. At that point she was still a child growing up in rural KZN, she has never as an adult experienced any issues related to the ear. She attributes that to the traditional medicinal practices.

(iii) Indigenous Folklore Storytelling: Idioms, Proverbs, Poems and Myths for teaching life lessons

IKS emphasises the intellectual and sociocultural benefits rooted in folklore and traditional songs that may have been overlooked in formal education. It guarantees that learning is put into context within local knowledge and spoken language (Nomlomo & Sosibo, 2016: 110). Nomlomo and Sosibo further cite Mapara (2009) and Meyiwa et al(2013) in explaining that oral language encompasses riddles, poems, songs, legends, proverbs and myths which are valuable both culturally and educationally (Nomlomo & Sosibo, 2016: 110).

In addition to indigenous games, folklore seemed to be the most spoken about form of IK that the educators mentioned especially those who teach languages. In one instance, educator 6 who is a Life Skills teacher said she uses storytelling as a form of encouraging creativity and teaching certain life lessons to the learners. Similarly educator 4, mentioned his use of storytelling in his IsiZulu lessons to teaching lessons such as respect and discipline.

Educator 4: ...bengibatshela abantwana, ngibatshela ukuthi uyabona inganekelwane lezi, zinesifundo phakhathi, hayi ukuthi inganekelwani, yes zazijabulisa, zifundisa, zikhuza and zibaqhaphelisa ezintweni ezithile. Right, kukhona le engithathat ngaso isibonelo, ebengibayenzisa, eye mfene, impisi ne ngwe. Okushuthi ingwe beyihllupha lezilwane, bezihlala zibaleka, zibalekela yona lengwe, ekugcineni zase ziza nesu, ukuze nathi sizophila ngokuthula, senzani uku dealer nale ngwe. ya suggester impisi yathi no asiyoreporter enkosini yezilwane. Imfene yathi hmmm no kuzothatha ekudeni kakhulu, asimususe, weza noshevu, asisebenzise lokhu. So, ngase ngithi kubo, ngithi alright, ngifuna abathi bahambisana no mpisi ukuthi mabayo reporter enkosini, nabahambisana no mfene abathi masimufakele ushevu afe. Babebancane laba abathi ingwe makafe. Mina ngathi ngihamba nabathi makuyo reportwa enkosini, because I lesson esiyitholayo la, umuntu mayengakwenzi okuhle, into oyenzayo, u reporter kuthisha, awuzithatheli umthetho kuwe ezandleni.

(...I was telling the learners that folklore have lessons in them, its not just a story, yes they entertained, taught and to reprimanded and warned against certain things. Right, there is one I will make an example that I was telling them, of a monkey, a wolf and a tiger. The tiger was troubling the other animals, so the animals used to always have to run from the tiger. So in the end they came with a planand said for us to live in peace, what do we do to deal with this tiger? The wolf suggested that no lets go report to the king of animals, the monkey said no, that will take us long, lets just get rid of him (the tiger) and brought poison and said let's use this. So what I said to them is alright, now I want those that go with the wolf in going to report to the king and those that go with the monkey that say let's poison him so he dies. A few went with killing the tiger. I then told them that I go with those who are going to report to the king, because the lesson we get here is that if a person doesn't do right by you, what you do is report to the teacher, you report, you don't take the law into your own hands).

The educator further specified that in the story, when the monkey kills the tiger, there are repercussions to the actions. Additionally, what was noted was the value of storytelling for families.

Educator 4:...if you notice, grandmothers used to tell folklore around evening time, now storytelling is replaced by TVs. Yes there is right information that they get from these TVs however there's no interaction.

Evident from the data presentation is that a theme that came out of the discussions is that of the benefits of using myths, proverbs, idioms and traditional poems to instil some life lessons . In African languages, proverbs are used intentionally to educate and to manipulate and coax. McKenna (1974) explains that proverbs are used by society as a warning mechanism of the dangers of life. Proverbs can also be used to discipline a child, by sending them off with a proverb to interpret in order to do some soul-searching (Kuzwayo (1998:14).

Educator 4 made several references to sayings that were used when he was growing up, which at the time he would not have understood. He did this to share that some lessons cannot be taught by textbook to learners but using the IKS way of sometimes

using sayings and superstitions, may instil some lessons and discipline without having to find it in a textbook and teaching values.

Educator 4: eh uyabona mama, ulwazi lwesintu, traditional knowledge, ludlala indima ebalulekile kakhulu, njengoba sisho ukuthi funeka siyi incorporate ne curriculum. Lokho kubalulekile kakhulu, kanjani ke? luyafundisa kubantwana, bekukhuza, kubajabulisa, ngikhulumela ke manje la eklasini, luyasikhuzela kubantwana. Ngifuna ukebekisa ngemizekelo yakudala, bekuthiwa, 'ungahlali endleleni uzavela ithumba'. Yazi bekushelwani kanjalo, bekukhuthaza ukuthi mayephuma eskoleni, aye kuphi, ekhaya.

(eh, you see indigenous knowledge, traditional knowledge, plays a very important role as we are saying it should be incorporated with the curriculum. That is very important, how then? It teaches to the, disciplines and entertained, talking now about bringing it to the classrooms, it helps with disciplining the kids. Using examples from the past, They used to say to kids "don't sit on the road, you will develop a boil". Do you know why they said that.. it was to encourage a child that when they leave school they must go where, home).

He made an example of how as young kids they were told that you would turn into something if you urinate in the water, the threat of turning into something ugly made kids refrain from doing this.

Educator 4: they used to say 'úngachameli emamzini uzophenduka ehh', what did they say you will have again, or you will turn into...

As an adult he has now been able to understand that the whole point was to promote hygiene and also because the same water from rivers they used for cooking and drinking. Had he been just told this as a kid, he doubts that this would have encouraged him enough to try not to urinate in the water that they used for bathing and cleaning. Before he could share his understanding on IKS, educator 1 wanted some clarity of the extent they could share, for instance he mentioned that just because it wasn't called medicine, the use of plants such as aloe have been part of life at home, but also

there are certain beliefs and myths that they have grown up which has formed part of what they know as adults.

Educator 1:..bengisabuza wena sisi, ukuthi before mhlampe sizisho lezinto, njengokuthi, mhlampe izinto mayisibuka njekoku sebenzisa inhlaba for ukuyicleana, uyabona ukuthi kahle kahle I aloe iyikhamba, just ukuthi emakhaya bebengasitsheli ukuthi mhlambe iyikhambi. Sengibuza ukuthi kukhona nezinye izinto eziyinkolelo, nazo mhlambe siyifake lezozinto ezikanjalo, nazo ziyadingakala. Njengokuthi, emakhaya bebenokusitshela ukuthi uma ubuka inyanga, kunomama othwele Inyanda ne ngane and mawuthi uyabuka ngempela ukhona

(..I wanted to hear sister that before maybe we say these things that you are saying, like when you look at things like using aloe for cleansing, you actually see that really aloe is a remedy (medicine), just that in our homes they didn't tell us that it was medicine. I'm saying there are other things that are, that are beliefs, should we also include things like that, are they also needed. Like, growing up in our homes they used to tell us things such as that if you look at the moon, you will see a mother carrying a pile and a child and when you looked you'd actually see that)

Researcher: I would appreciate for us to actually go even to that extent...

The legend of the woman on the moon is one such that has been told by many, the purpose of such is to instil some lessons to the audience.

'As a child, you could have been told of a legendary woman in the moon; carrying a baby on her back and a hoe in one hand. She is also said to be carrying firewood on her head, a story meant to inspire many to work hard. This legend will tell you that the woman is partners with the sun. Other legends have talked about a man in the moon carrying bundles of stick on his back and accompanied by a dog. He is said to have chosen to work on Sunday as opposed to going to church and was forever condemned to work' (Wamala:2014).



Picture 2: The woman in the moon: Full moon viewing (Wamala:2014)

(iv) Spiritual element of AIKS: Rituals and ceremonies

Another theme that has emerged is the emphasis by the educators on the element of the spirituality when speaking about their idea of AIKS. The educators spoke about the knowledge being from their ancestors. In this case there was mention of some ceremonies being done to ensure connection with the ancestors, for example, Imbeleko is said to be done for the child to be introduced, recognised and be connected to their ancestors. Emphasis on African spirituality is further evident from such response from educator 9, who mentions cleansing ceremonies after death. Educator 9 added to this conversation, touching on beliefs and ceremonies.

Educator 9: nanokuthi ke, iinkolelo zethu azifani, (also that, our beliefs are not the same)

Researcher: yes

Educator 9: kukhona abanye abawenzayo amasiko, abanye abawenzi, bathi hayi thina asikwenzi lokho, bese kubakhona abanye abawenzayo amasiko ngendlela efanele. Thina njengokwazi kwethu, njengoba singama Zulu nje kanje, siyazenza izinto. Abanye bathi mangabe kushoniwe, abakugezi, kodwa abanye bayakugeza, bakwezele umsebenzi (there are those who perform customs, others don't, they say no we don't do that, then there are those that perform customs in the correct way. Us as we know, as we are Zulu, we do things. Others when there is a death, they don't cleanse you, but others do cleanse you and perform a ceremony).

The elements of beliefs and spirituality shows the holistic nature of AIKS. An example of the aspect of holism can be seen in southern Mozambique when it comes to reassuring and cleansing mourning children and families in order for them to be re-integrated into community life and to also assist them spiritually to deal with loss. Rituals are vital elements when it comes to the holistic approaches of care. Cleansing, protection and integration ceremonies performed by communities are there to create public bonds and connect the living to the deceased. In northern Mozambique, there is a ritual named Nimualho which is done after the death of a loved one. The purpose of the cleansing ritual is to aid children to 'forget' the difficulties they may experience due to a death at home. The ritual can be conducted in the house where there is a death, alternatively, it can be performed under a nearby tree by a traditional healer who makes a fire and scatters a special substance inside and around the house. The members of the house go over the fire and run to any direction away from it without looking back symbolising that the loss has been left behind. (Samuel Family Foundation:6)

This goes back to the literature phase of the study which has indeed highlighted that AIKS incorporates even beliefs into its system of knowledge. Educator 3 also supported the view by sharing what he knows of IKS as something that relates to beliefs by giving examples of some beliefs that were there about giving birth to twins and what the practises would be when that would happen, in some instances not letting the other twin survive for reasons he doesn't know.

Educator 3: mangizokhumbula kahle, u auntie wangixoxela ukuthi ma, bebezalwa bengamawele, so bukuthi elilodwa belibulawa, angazi...(If I remember correctly, my aunt told that if twins were born, one would be killed, I don't know).

It was educator 7 who said sometimes if parents were getting a lot of twins, the parents wouldn't live long and so it was believed that by killing one, it would prevent the premature death of one of the parents. These are just beliefs that are out there, even though they are unexplained and, in this case, where a practice has been done by generations in the past.

These might not be proven beliefs or scientific, but such have formed part of AIKS for years before and have been shared through generations whether orally or through stories.

Interestingly, there are some articles about the killing of twins even in the Nigerian culture. It was believed by a number of communities in West Africa that twins served an important, spiritual role. The Igbo for instance, killed twins due to fear. On the other hand, the Yoruba revered twins and worshipped them as Gods, they believed that if they did not, there would be dire consequences. The reasons why different cultures in West Africa had varied opinions on how twins were to be treated differed according to their own religious beliefs. These beliefs may have been interpreted differently from one generation to another, however whether perceived as good or evil, twins continued to be important spiritual figures among many African cultures during the Iron Age (Adewumi, 2014)

This type of engagement is seen in a discussion paper by Onwu & Mosimege (2004), where in the interview under the topic 'Indigenous Knowledge: Should beliefs be included in a science curriculum?', where we see the concern about IKS and the validation of part of this knowledge and whether or not just because something cannot be scientifically validated, it then means it serves no purpose. Below is an excerpt of part of that interview

The Editor: Over the years beliefs about the natural world have been developed in Africa and which seem to fit our definition of IKS. Emereole et al. (2001) have catalogued 61 such beliefs in Botswana. One such example is, "The rain by-passes the farm/field of the person who stands while drinking during the ploughing season (p. 78)". Do such beliefs have a place in the science curriculum? (Onwu & Mosimege, 2004:7).

Gilbert: Perhaps we can begin our discussion from this perspective. I would like you, Mogege, to put yourself in the shoes of a Science teacher in the classroom with learners from different backgrounds who are trying to deal with two knowledge claims. One has come from the Western scientific knowledge system and states something to the effect that rain is the result of evaporation and so on and so forth. A second knowledge claim from IKS states that rain can arise at will as a result of human action. Here the explanation is based on how the local world works through a particular

cultural perspective. As a teacher you could say we have two knowledge claims. It is for us to look at the evidence for both and evaluate that evidence. What independent measure of evaluation would be valid in this case? The problem one foresees is that the teacher would probably take the methodology of the one to evaluate the other and thus applying one mutually exclusive method to both. Do you think that it would be a legitimate approach for a science teacher to call for evidence for these two knowledge claims or is such an act in itself, privileging one system over the other? How would you handle, as a science teacher, that kind of situation in the classroom? (Onwu & Mosimege, 2004:7)

Mogege: I think it is an important question that is being raised here. In other words, when you find, let's say there is a conflict between one system and the other, where do you go, what happens next? I think we need to dig deeper to find what informs a particular belief and why that belief existed in the way it did. There are many occasions in which beliefs exist which are not necessarily correct but were put in place to promote certain practices. I think that the lesson in the context of the example given is that if you stand and drink during the ploughing season, you are not likely to put your best effort forward and will go hungry ...((Onwu & Mosimege, 2004:7)

This excerpt highlights the important engagement that must be held about IKS especially if it is to be included in the curriculum. There are many factors to consider, however with continuous work and discussions as the one above, progress can be made and IKS successfully implemented without the downplaying of the knowledge due to aspects that form part of it such as beliefs. As can be deduced from the excerpt and even from the focus group discussions, sometimes some beliefs were told to teach certain societal lessons and values.

Similar to the experiences of the educators from the first school, the study found that the teachers' understanding of what IKS from the second school (School B) was also mainly based on the lived experiences at home and in their communities rather than from textbooks. The point of reference made by Educator 7 in explaining her understanding of IKS was that it is knowledge that we get from our ancestors and

elders passed down through generations and made the point that such knowledge is destroyed and to some extent diluted with as the times have passed.

Educator 7: mina bengizothi I indigenous knowledge system, kushuthi ulwazi esilisuselaphi khona, esilisusela ko Khoko, kokhululu bethu. (I would say that its indigenous knowledge system, is knowledge that we take from our great grand parents, meaning it started from great grandparents), then it's just being taken from them, down to generation, from generation to generation, its just being passed from generation to generation, bese kuze kuze kuze kufike kuthina ke, kodwa ke ngokuhamba kwesikhathi kuya ngokuya lololwazi lishabalale, sesiphila esikhathini samanje la, sesiphila nabantu abaningi, sesiphila nabelungu, namandiya, nabo banalwabo ilokhunjane, I indigenous knowledge, sibuye sithathe nokwabaye sikuxube. (and it come and comes and gets to us, but with the passing of time, it goes and the knowledge becomes extinct, we now live in current times where we live with a lot of people, we live with white people and Indians, they also have their own indigenous knowledge on their side, we then take from theirs and mix)

In terms of examples that they gave in relation to the knowledge that they've received, the example of practices such as Imbeleko (a ceremony done when a child is born), cleansing ceremonies after death were given as practices the educator has learnt from home and community. This again reiterated the element of ancestral connection that differentiates IKS from other systems.

Researcher: Are the examples you can give me to say okay, we knew that where we lived, certain thing is done in a certain way, not that you learnt from a book, just maybe you had been told at home.

Educator 7: Examples can be maybe of eh birthdays, imbeleko, when umntana ezelwe (a child is born). That is one of the indigenous knowledge ebesikwazi ukuthi umntana uma ezelwe kufanele ukuthi enzelwe imbeleko, eh kuhlathshwe imbuzi and so on, ukuze kukhombise ukuthi uyamkelwa, siyamazi la ekhaya. (that we knew that when a child is born, we must perform imbeleko, slaughter a goat and so on to show that they

are welcoming the child into the home and showing that the child is recognised in the home)

There were also examples from growing up as women, where it was indicated that a woman should not consume certain foods at certain periods, this could be connected to how the elders knew how some foods have an effect on hormones even though there were no textbooks on this.

Educator 7: nokudla futhi even food, okay, ekudleni abantu besifazane bebengadli nomayini ngokwazi kwethu, (when it comes to foods, women did not just eat anything according to our knowledge)...for example umuntu wesifazane mayeganile, ewumakoti emzini, ubengayidli inyama (a woman who has married, when they are a bride at the husband's home they did not eat meat) up until a certain period la ezohlatshelwa khona bese kuthiwa hayi ke manje sowungayidla inyama. Intombazane ibengawadli, ini, amaqanda, ibingawadli amaqandi ingadli amasi (when they slaughter for her and say okay now you can eat meat. A girl did not eat, what, eggs, did not eat eggs and sourmilk)

5.5.1.2 Benefits of having AIKS in school

One of the questions asked during the focus group was whether the educators thought that there were any possible benefits that may be realised from the incorporation of AIKS into the curriculum.

There were a number of benefits that the educators noted as they were giving examples of AIKS, namely, the use of the knowledge to instil life lessons, the use of AIKS to navigate socio-economic realities and also restoration of Ubuntu through AIKS. From the discussions the following themes emerged, in relation to this overall subject.

(i) Sustainable livelihoods

According to the educators from the school, there is value in adding this knowledge in the classroom, for instance, they indicated that it would help learners find solutions to some of the problems that they come across in their lives. More specifically coming from backgrounds where there is limited access to facilities and resources.

On responding to whether they feel there are benefits of having AIKS in the class, Educator 7 indicated that if learners understand and value the knowledge and see it as part of education, they would not be hesitant to practice it at home. One example the educator gave was that, if a learner is ill, she would advise that the learner tells the parent that they can use methods such as enema or herbs for a specific ailment. This means that the learner can transfer some knowledge to home where maybe a parent might not be able to get to a clinic or doctor. This just shows that AIKS brings in alternative ways that households and communities can take care of themselves.

Another example that was given, in support of AIKS, is that, if taught it can help learners navigate their experiences in life. Some learners don't have clocks or watches at home and would sometimes be late, Educator 7 mentioned that if they were taught in the same way that she was when growing up, to say that when you see the brightest star close by, it means it is dawn, or hearing the number of hens increase in the morning it means it is time to get ready for school.

Educator 7: Ngoba nje, ngingathatha ngibuke nje, khona lezingane, ezingenawo amawashi ekhaya, ezingenalutho nje, uyakwazi ukuthi ubatshela nje ukuthi, nifika late la eskoleni, ekuseni uyavuka ubheke, kukhona Inkanyezi ekhanya ephuma lapha, kwa phuma leyonkanyezi e khanya kakhulu sekusile, vuka ke, thina sakhula kanjalo vele. Ukuthi uyaphuma ekuseni uzwe iinkukhu zikhala, kunezinkhukhu la e makhaya, mawuzwa iinkhukhu sesikhala kaningi, sekusile. (when I look at things, there are children that don't have watches at home, they don't have anything, you are able to tell them that you come to school late, you need to wake up and look up at the star that comes out that side, when that star is shining, the one that shine very bright, wake up then, it is the morning, that's how we grew up. That you go out in the morning and

listen out for the chickens, there are a lot of chickens in the rural areas, when you hear many of them, it is morning.)

Although it is the expectation that in this day and age most households have access to watches and cell phones, it is not the case for all households especially in rural areas, some might have cell phones and some points struggle still because of no electricity, this is where using such knowledge would be helpful. These are some ways that the knowledge would also help learners who lack certain resources. The benefit would also be that kids learn early how to sustain themselves, families and communities and reduce dependencies.

An example that was given in terms of sustainability, has to do with agricultural education, Educator 7 mentioned that growing up, at school, each learner had a portion of land that they were allocated and had to learn how to maintain and preserve in order grow some food. Besides getting food, this taught them responsibility and patience. In this paragraph, you are referring to examples from different spheres. First it is the time, then agriculture.

Educator 7: ...lokho kwakwenza ukuthi uwazi nawe ukuthi umhlaba yazi, siyadla la emhlabathini. Abantu abaningi bazi ukuthi fanele uyocela, kanti kukhona ongakuthatha emhlabathini (that made sure that you also know that land, you know, we eat here from the ground. A lot of people know that they have to go ask, whereas they can get something form the land)

Educator 8 spoke about how they were taught to take of their spaces. She mentioned how they were required to clean when they got to school. To her, this taught them responsibility, but also skills of taking care of themselves and their spaces.

Educator 8: ngesikhathi sethu kwakudala, wawusuka ekhaya nobulongwe, uzenabo esikoleni, kwakungekho ukuthi esikoleni kukliniwe kanje, kwakwenza thina, so izinto zakukadala kwakuzinto ezinzulu, kulesikhathi samanje izinto zilula, njengala emaklassini, kukhona iingane ezingakwazi ukutshanela. (during our olden times, you used to leave home with cow dung, bring it to school, there was no thing that at school

they have cleaned, we had to do it, so thing from the past were useful, in these times things are easy, like hear in the classrooms, there are some children that don't even know how to sweep.

What educator 8 wanted to emphasise, is the value of how they were given chores and how it has taught them to have skills that they can apply in taking care of themselves and households.

(ii) Restoration of Pride and Ubuntu

All the educators from School A agreed that there is value in adding this knowledge in the curriculum. Educator 2 noted that bringing such knowledge would enhance respect in the classroom, respecting diversity and other ways of knowing.

Researcher:.. when you look as a teacher of Isizulu, English. Do you see that there are benefits in bringing this to school, to teaching

Educator 2: Yes there are

Educator 1 and 3: yes

Educator 4: Siyavuma mama (we agree)

Educator 2: There are benefits, there are values, like irespect, so that they respect ehh like eh I don't know what I can say they must respect. Like you know when we believe, we believe in things that are not the same, so maybe me I can explain that at home I grew up being told that if you are pregnant to don't stand at the door, so maybe if I tell you, you shouldn't say haai like eh it's a thing of the Zulus, people must respect

Researcher: So they must respect other ways of knowing

Educator 2: yes, yes

Another benefit is that having this knowledge can help the learners know their history and take pride in their roots and who they are. It can help build confidence of the learners to be able to share knowledge that they can feel they have ownership of with others worldwide.

In addition, Educator 1 shared an example of how knowing your knowledge can be a demonstration of pride in who a person is.

Educator 1: mhlampeke kulolulwazi lolo lwethu, lolu oluthi, besikholelwa ukuthi intombazane mayipregnant ayimi emnyango, nakho ke kuyasiza ukuthi umuntu azi, kusiza naye ukuthi, makuqhamuka lo we western, mhlampe mebaba ne conversation, amutshela ukuthi oh thina e Africa we believe in 1,2,3 and 4, even though mutnu engbhilivi, kusiza kuye ukuthi eh ulwazi lakhe as um Africa.

(Maybe in this knowledge of ours, maybe like how it was said that a when a girl is pregnant she doesn't stand at the door, it helps her also in that maybe someone who is western and they have a conversation, she can tell them that we in Africa we believe in 1 2 3 and 4, even if they don't believe. It helps them in knowing themselves and their knowledge as an African)

Another important benefit that was mentioned was that this can lead to the restoration of humility in communities. Some of the knowledge was rooted in principles of respect and ubuntu. Teaching pride in what is theirs. This was reflected in the response from Educator 6 from School B.

Educator 6...restoring ihumility

Researcher: oh yes

Educator 6: because njengamanje (like now), there are things that people do, that you feel that azibuldi umphakathi (they don't build the community)...I think going back and learning how things were done, I think that will give us direction and also knowing ukuthi (that) how some things should be tacked in life.

Ubuntu has been a very important way of life for African people. Ubuntu and IK are entrenched in South Africa's culture, furthermore, the government also tries to support and promote African cultures in various ways ((Selela, 2015:4). Ubuntu principle looks at how an individual involves others as family for support in life because the load of life challenges seems to be reduced when people that have encountered similar challenges bring multiple inputs and advice (Broodryk ,2006).

5.5.1.3 Incorporation of IKS in teaching by educators

(i) AIKS and the rural context

People in rural areas use AIKS as part of their daily lives, due to the lack of resources and access to some services like health care and electricity in some areas, using AIKS has been one of the ways that people in rural areas use to survive. Unlike in urban areas, rural areas have access to more natural resources such as land and even some indigenous plants. This is an example of the advantage that a school in a rural area may have when it comes to AIKS, they may have more practices to draw up in this regard.

Schools in rural areas do however face many challenges that may be a hindrance in their ability to incorporate AIKS in the classroom. In a lot of cases, educators in rural schools are required to teach different subjects and different grades in one class. This issue can have an impact on educators in terms of how they plan their lessons for each day and each period. Having to also balance their time to teach different grades, administering assessment tasks for learners and also having to instil discipline in class. Educators usually resort to teaching abridged curricula and hardly adapt the curriculum, or even utilise examples that link the curriculum to local needs (Aziz, 2011).

Teachers in schools in rural areas experience numerous serious challenges. Some learners walk long distances to get to school. School learners often find that the curriculum is irrelevant to their lives and that education is not supported in their homes.

In choosing the two schools, the researcher decided to take into consideration the different socio-economic backgrounds that the teachers are faced with in carrying out their daily activities. This, from the discussions, seems to have a bearing on the experiences that educators have in the classroom. Although the educators shared to some extent similar experiences, there were differences that were notable, which affected their attempts of incorporating AIKS. For instance, the educators from School B, which is a school in a rural area, have more examples that they could draw from in terms of AIKS, which they saw as potential to be used in their classrooms. In addition, the educators from this who participated in the study had more years of experience in the field and some were teaching more than one grade and subject compared to the educators at School A.

The participants from both schools did have however the wish to be able to incorporate AIKS in their lessons, but due to the challenges which were shared during the study, it was not easy for them to do so. What was notable was how educators from the rural area were faced with not just having to be responsible for multiple subjects and grades, but due to living circumstances of the learners, have also had to bear that in mind when conducting their lessons.

Although, some of the challenges faced by School B are also true for School A, the extent is not the same. This has in turn been a factor in the classroom, where educators need to ensure that learners are taught what they need to be taught, whilst on the other side be taught AIKS knowledge that would be of value in their livelihoods for example in the instance where the discussion was about teaching learners some gardening so they can be able to grow their food. With regards then to incorporating AIKS in Basic Education, it can be deduced from the experiences of educators that this is not being effectively done due to a number of challenges faced by the educators, even though they are open to and support having AIKS in their classrooms.

Schools in rural areas face a number of challenges that affect learners and also the way teachers can do their jobs. The researcher noted how the school facilities firstly were different between School A and School B. In the rural school, it was noted that when it was break time, the kids had limited number of toilets to use and some ended up urinating in the field. The toilets, unlike those of School A, are pit toilets. The play

area of the school was also relatively smaller for the kids with some of the kids playing in the assembly area. School A compared to School B has more classrooms, the school has administrative personnel, unlike School, that does not have enough personnel and have struggles with security issues such as burglaries.

5.5.1.4 Challenges for educators in incorporating AIKS in teaching

The educators were requested to share some of the challenges that they have experienced in incorporating AIKS in their classrooms. The main challenges that were noted include lack of resources, time and AIKS material.

(i) Lack of AIKS content/material and time allocation in current curriculum design

The main challenge that Educator 5 who is a Life Skills teacher indicated as a challenge was the lack of resources to even try to incorporate AIKS in the classroom. For instance, with indigenous games, schools should be provided with the equipment to play those games and not be expected to use recycled material such as tins, stones, stockings as done when kids play these games at home.

For Educator 2, her experience seemed different as she indicated that she did not have any challenges especially under the study area physical education lessons except that maybe she can do more during those lessons especially for the foundation phase classes.

Educator 2: like me, since you said there is no right or wrong answer, me I said there are no challenges as such, I took it and put it on Life Skills, under study area physical education. The only thing is that, we, at foundation phase we take shortcuts in physical education, we focus a lot on beginning knowledge, the one of writing. Even if there had to buy us the skipping ropes, bean bags, we end not knowing where to put those things because we take shortcuts at foundation phase. I am only talking about my phase

All educators were in agreement that time is also seen as a challenge because, as educators, there are prescribed lessons for the period and for them to then have to incorporate other material in a creative manner with limited time available becomes a challenge. That's why some educators stick to the prescribed material to ensure that they don't deviate from their lessons. Some have multiple subjects to teach which set hours to do that.

Researcher: Besides the challenges of kids being too young or not being able to add material for certain subjects, other challenges for incorporating IKS in the classrooms, what could they be, that you can think off or you foresee it could be a challenge

Educator 6: mina (me) the first challenge engiyibonayo (that I see) is time, there is a lot that we have to do and isikhathi (time) sometimes doesn't allow us to have any other thing because even in the curriculum we have isikhathi esinikeziwe ukuthi (time that we are allocated that) by this time we need to have done this, yiwo amachallenges ohlangana nawo (those are the challenges that you encounter), you end up not even being able to finish that, so its time

Table 3: The instructional time in the Foundation Phase

SUBJECT	GRADE R (HOURS)	GRADES 1-2 (HOURS)	GRADE 3 (HOURS)
Home Language	10	8/7	8/7
First Additional Language		2/3	3/4
Mathematics	7	7	7
Life Skills	6	6	7
• Beginning Knowledge	(1)	(1)	(2)
• Creative Arts	(2)	(2)	(2)
Physical Education	(2)	(2)	(2)
• Personal and Social Well-being	(1)	(1)	(1)

TOTAL	23	23	25
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(DBE, 2011:6)

The table shows the instructional time for subjects in the foundation phase which the educators have to adhere to. For all grades at foundation phase, more hours are allocated for home language teaching. The Grade R does not have any time allocated for the first additional language. The total allocated time for Life Skills is divided into three categories and the hours do not seem to be much when split into the different learning areas. There are also instructional time allocations for subjects in the other phases of the basic education level. Educators are expected to use this allocated time to deliver what has been prescribed and also be creative in adding IKS in their lessons.

The challenges for the educators in School B were similar to those at School A. Firstly, the issue of time was raised, where educators have to make sure they cover what is outlined for their lessons, which leaves them with less time to try and add on to these lessons some AIKS. This was exacerbated at the school in the rural area since some of the teachers are teaching more than one subject and multiple grades. The time issue is interlinked to the curriculum design issue that was raised.

The curriculum design according to the educators doesn't give much room to be creative and add something in the lesson plans, it prescribes you to do things in a certain manner given a certain time. Another issue that was raised was that the learners are also not receptive to additional material and creative ways of learning in the classroom.

Educator 6: ...the way the curriculum is designed yabo, nje ayikunikezi (you see, it doesn't give you) that space, that you maybe can add other things. You simply do 1,2 and 3. Then after that, mawusezofaka lokho okucabangayo ke (if you were to add what you think off), you are not able even, though you see that you can add but you can't

Educator 7: another challenge, is the kind of children we are dealing with that we have now, uhlobo nje lezingane (the kind of children) they are not that receptive enough, you see, I don't if they are wild or what, I don't know...nalento ye COVID-19, akukho

lula ukuthi singafaka I indigigenous knowledge system, ngendlana abantwana bethu abangasazi lutho ngakhona (even this COVID-19 has added, it won't be easy to add indigenous knowledge system, the way our learners don't know anything)and then I learnt something that a learner who is grade 3 right now knows grade 1 work, if they are in grade 2, they don't know anything. So the type of learner that we are dealing with cannot really accommodate that indigenous knowledge system

This was very important to note, since with the COVID-19 pandemic, learners in some areas had some access to online learning unlike in the rural settings. This means that learners are far behind in comparison to their peers. Even though School A is a township school, it is still in an area that has facilities that can provide wi-fi, parents of learners in townships also mostly do have access to smart phone. This is different from rural schools where infrastructure for wi-fi is a challenge. The educators in school A, did not mention the COVID-19 effects on the learner's development.

Below is an extract from the Life Skills CAPS document. It is an example of outline of study material for the Beginning Knowledge and Personal and Social Well-being study area. This gives us an indication of some of the activities that educators need to make sure they cover in their lessons. This helps us see what the educators are talking about in relation to content and time allocation in lesson plans and how it affects their ability to incorporate IKS.

Table 4: Outline of course material

Term 2 Grade 1		
Beginning Knowledge and Personal and Social Wellbeing	20 hours (2 hours/ week)	Recommended resources In addition to the standard resources for Life Skills you will need: • Pictures of different kinds of family • Examples of danger/ poison signs • Examples to stimulate senses: textures, tastes, sounds, smells • Charts to show body parts

Do routine activities and free play activities indoors and outdoors as specified in Section 2.

- Use a class calendar to discuss the day and the month daily throughout the year.
- Keep daily weather chart updated.
- Revision, assessment and feedback should be done on an ongoing basis. (Time allocations allow this.)
- Religious days and other special days celebrated by the community should be discussed as they occur

throughout the term. (Two hours per term are allocated for this)

Topic: My family - 4 hours

- What a family is
- Members of my family - immediate and extended
- Caring for each other at home

Note: Learners come from many different types of family. Ensure inclusivity.

Topic: Safety in the home - 4 hours

- Dangers at home
- When cooking
- When washing
- Lighting and electricity
- Outside areas
- Medicines
- Poisonous substances - types and recognising warning symbols
- Keeping safe when home alone
- Emergency number card

Topic: My body - 6 hours

- Different parts of my body
- Different parts of my body which move
- Parts of my body that I cannot see - include lungs, heart, stomach, brain, skeleton
- The five senses and their uses - touch, smell, sound, sight and taste

Topic: Keeping my body safe - 4 hours

- Safe and unsafe situations and places - such as waiting for transport, alone in shopping areas
- 'Yes' and 'No' feelings
- Practising saying 'No'
- Protecting our bodies from illness
- Covering mouth and nose when sneezing or coughing
- Never touching another person's blood
- Washing fruit and vegetables before eating
- Making water safe to drink

Religious days and other special days - 2 hours

(DBE, 2011:31)

The table shows that educators are guided in their lessons. It is required of them to make sure that the prescribed areas in their lesson outlines are covered, after which

they can then add whatever they feel will enhance their lessons. For some study areas, room to add more content or different ideas is there, but it is not the case for all subjects.

In as much as educators are expected to use IKS examples in their lessons, with such prescribed lesson plans, it is not easy. It would mean that an educator, with each topic that they need to cover, has to research relevant material on the matter, while making sure they don't deviate from the plan and staying within the allocated time. If an educator is given 4 hours to cover the topic, 'keeping my body safe', priority for them will be to get through the material provided by the department, because that is how they will be assessed. They will be less inclined and flexible to add something that might use up their time resulting in them not covering their prescribed material.

Educator 8 who teaches grade 1 said she found it difficult to her students who were still very young. For the Mathematics educator, she found it difficult because they were not aware on how they could incorporate it into mathematics education, this is when the researcher referred the participants to a paper by Mosimege (2020) on the subject of indigenous games and its use for Mathematics education. This was an attempt by the researcher to share with the educators on some useful material that might assist them in their attempts to incorporate IKS. Again, unless of course it is written somewhere in the lesson outline, it would be difficult for an educator to add this in their already prescribed lesson for Mathematics. Perhaps you could indicate one or two ideas from this Paper by Mosimege to illustrate your point further and to show how the teachers can make an effort.

5.5.1.5 Guidance and support from DBE

It was important over and above the interview with the DBE representative, to get a sense of the educator's experiences were, in relation to the issue of support from the department.

This would provide another perspective that may be useful in making the recommendations and the end of the study.

(i) Not enough support from DBE

It was very important to find out directly from the educators whether they have been receiving support from DBE that is particularly related to incorporating IKS in the classroom.

Researcher: the department of Basic Education, have they come to you. To say, there is this thing IKS, we will come, give you maybe guidance and support on how you can incorporate it...

Educator 4: one thing we have heard were rumours that we will be learning in home languages, we heard that they want to introduce that subjects be done in home languages

From School A, in as far as IKS is concerned, the educators noted that they've heard rumours that at some points learners will be taught in their indigenous languages but no concrete message that has come to them on how and when this will be implemented. Educator 2 from the school mentioned that they have received memos from the department which required them to select a number of learners who would participate in indigenous games. In terms of formal training educators from both schools stated that no formal training on IKS and incorporation thereof has been provided and that there have no material resources to support their efforts.

From School B, the educators felt that there was no support from BDE. Educator 7 indicated that for her, even knowing about IKS was through her own reading and understanding.

Educator 7: mina (me) to know about indigenous knowledge system, I've learnt from one of the books, it was a Social Science book

She mentioned that even in workshops, Subject Advisors have not orientated them on this subject and its incorporation into the curriculum. Educator 6 indicated how at one point, the Nali'bali organisation came through to the school to encourage indigenous storytelling, but that's was not something that happened consistently and they are not sure if this was something organised by the DBE.

Researcher: did Nali'bali come on their own or were they sent by the department?

Educator 6: I think they had come on their own because they are an NGO and they select particular schools for their projects

5.6 CONCLUSION

In this chapter, the data from the interview with the DBE official and educators from the two schools was presented and discussed. The responses were recorded under headings that are in line with what the researcher hoped to understand with this study, for instance, teachers understanding of and experiences when it comes to AIKS. From the responses, the researcher was able to deduce what the emerging themes were from the data. These themes were grouped under two headings. This was to indicate which themes spoke to experiences and which gave light to the types of AIKS that can be incorporated into the curriculum.

CHAPTER 6

SUMMARY AND RECOMMENDATIONS

6.1 INTRODUCTION

This concluding chapter provides a summary of the entire study, findings and provides recommendations. The researcher reflects on the study by looking at what it aimed to achieve at the beginning and to see whether the objectives were achieved. The chapter summarises the methodology that guided how the study was carried out. After the summary of the study has been provided, a recap of the key findings of the study is made. The findings are put under subheadings of each of the objectives of the study. Finally, the chapter provides the recommendations that are based on the findings.

6.2 STUDY SUMMARY

At the start of the study, it was ensured that the research question is clearly stated to provide direction for the research. This together with the research objectives was an indication of what the study intended to achieve. The overview of the study was outlined in chapter one. Overall, the question that the research sought to answer is

‘What have been the experiences in incorporating AIKS into the Basic Education curriculum for two South African schools, in Gauteng and KwaZulu-Natal respectively?’

These sub research questions were derived from the main research question:

- What types of AIKS form part of teaching in the selected schools?
- What are the prospective benefits of incorporating AIKS into the formal school curriculum?
- What are the challenges faced in the incorporation of AIKS in the Basic Education curriculum of the two selected cases?
- How can AIKS be made part of the Basic Education curriculum in South Africa?

The next step was to make sure that a thorough literature review was conducted to understand the subject matter and to have an indication of what research has been done in the area of IKS as well as ascertain what gaps exist for further research. Concepts such as IK, IKS, AIKS, colonialism and westernisation as well as curriculum were clarified. An important aspect during the review of the literature was the discussion of the curriculum as it has evolved in South Africa. A review of how in the 1990s there was a move to transform education educational transformation in the country, resulting in the overhaul of the education system that was informed by the Apartheid regime. The result of the overhaul was the introduction of the RNCS in postapartheid. The RNCS informed a system that sought to introduce democratic education in country's schools. The objectives of RNCS were to produce a new identity for the country that involves critical consciousness, to change the country's society, by promoting democracy and that learners' involvement in education is magnified (Msila, 2007:151).

The RNCS sees education as a means that could drive the South African values enshrined in the Constitution, namely democracy, social justice, non-racism, equality and reconciliation. CAPS prepared by the DBE (2011) explicitly requires that IK be included into the curriculum. It was important to highlight the background of the curriculum reform in South Africa because it gives us a picture of why there is a call to include IKS in education. The literature review was an important step because through the exercise, examples of incorporation of IKS were discussed, this has been done across all levels of education and across different areas within and out of the continent. Looking at these examples was a way of providing an idea of the viability of this exercise and presented some of the gaps that this study can potentially fill.

The study was conducted through the lenses of the Systems and Symbolic Interactionism theories. The Systems theory outlook allowed for a better understanding of the overall nature of society as a whole. This knowledge of elements, interconnectedness and resolves of people, organisations and communities assisted in providing a general understanding of the relationships and functioning of the society. Systems theories made it useful to understand the complexities of IKS and ways in which it can be related and incorporated into the education system through the

curriculum. Teaching is a way of implementing the curriculum in the classroom, this is a practice that require much interaction between learners, teachers, society, teaching tools. From this interaction, much meaning is placed through experience which also determines the effectiveness of the implementation of AIKS in the curriculum. The symbolic interactionism framework helped in understanding how incorporation of AIKS can happen, taking into account teachers' experiences within the classroom as they interact with learners.

The research methodology chapter sets out how the study was conducted to achieve the objective. The study followed the qualitative research paradigm and the case study approach was used where two schools were selected as the cases. Nine educators participated in the focus group discussions, five from School A and 4 from School B. During the study, a semi-structured interview with the DBE representative was conducted which provided information on what has been done by DBE so far in terms of incorporation of IKS in the curriculum.

6.3 SUMMARY OF KEY FINDINGS

6.3.1 Different types of AIKS that form part of teaching in the selected schools.

One of the questions that the study sought to answer was *'what types of AIKS form part of teaching in the selected schools?* From conducting the study with the educators from the different schools, it became apparent that currently the IKS that educators are trying to include in their classrooms is mainly that which they know from their childhood experiences at home and in the community. That for the most part included using storytelling as part of teaching lessons in the classrooms. There was no documented AIKS that was used in the selected schools. Educators used what was carried down generationally as examples when trying to explain some concepts.

The dominant AIKS that seems to be a point of reference for educators was the indigenous games. Along with folklore this seemed to form part of the limited AIKS that forms part of teaching currently in the schools that were selected for the study. Another AIKS that was mentioned during the focus group discussion at School B, is

agricultural system. It was mentioned that previously, at school one would be provided with a piece of land and given the skills and knowledge to tend to that garden.

6.3.2 Prospective benefits that may result from the incorporation of AIKS into the formal school curriculum.

Secondly the study wanted to find out *‘what are the prospective benefits of incorporating AIKS into the formal school curriculum?’* . There was consensus that including this knowledge in the curriculum would result in benefits not just for the learners but for communities and the country itself.

The DBE representative indicated that this is one way of ensuring inclusive teaching and learning. In this case, inclusive education in the sense that there is diversity in the knowledge that learners are taught, the recognition of other knowledge besides just the western knowledge in the classroom. The NCS Grades R-12 is based on principles that are guided by the Constitution of the Republic of South Africa which puts Human rights, inclusivity, environmental and social justice at the forefront of education, It takes into consideration diversity matters including poverty, inequality, race, gender, language, age, disability and other factors, places value on IKS by recognizing the rich past and heritage of this country as a key driver to promotion the values contained in the Constitution. The NCS also requires that inclusivity ought to be a fundamental part of the organisation and teaching at each school, this can be achieved if all educators are thoroughly equipped in recognising and addressing barriers to learning and have knowledge in terms of planning for diversity (DBE,CAPS, 2011).

For a country like South Africa inclusive education is one of the tools that can be used to redress the injustices of the Apartheid system which still linger in our society. Incorporating AIKS would also be a way of promoting and celebrating the diversity in our country.

In the sessions with the educators, one important point was shared and that is, over time IK has been lost and future generations might lose the knowledge of the ancestors completely. Incorporating the knowledge in school would preserve this knowledge.

AIKS has the potential to instil a sense of self-consciousness and cultural identity amongst learners, teaching them to have pride in who they are. There are values embedded in the knowledge that in turn can help with re-instilling the principles of Ubuntu.

The study also found that including AIKS in the classroom would also benefit the learners, by promoting creative ways of thinking, promoting teamwork and making sure that learners are expressive in their learning than only being responsive. It was also discovered that including AIKS would help learners, even communities to navigate their own social challenges such as food insecurity, lack of access to health care facilities etc. Overall, the study has found that including AIKS in the curriculum would have benefits for the education system especially at the basic level as well as for communities.

6.3.3 Challenges faced in the incorporation of the AIKS in the Basic Education curriculum of the two selected cases.

The third sub-research question that the study sought to answer was

‘What are the challenges faced in the incorporation of AIKS in the Basic Education curriculum of the two selected cases?’

From the overall review of the literature and discussions with the educators, one of the challenges that can be noted is the documentation of AIKS, there is little to this regard, which in turn means there is less content material for educators to use in classes expect for the knowledge that they bring themselves from their living experiences. The challenges that were identified in the study include, (i) IKS Content Material, (ii) Time, (iii) Curriculum Design, (iv) COVID-19 impactand (v) Support from DBE.

(i) AIKS content material

Stemming also from the literature about documented IKS, the educators from the study noted that they have no content material available to them about AIKS which they can teach in their subjects. There are no textbooks, manuals etc. even in the case of indigenous games, there needs to be more resources provided accompanied by documentation of the games etc. there are no books in explaining for examples how indigenous games can be used in teaching mathematics.

(ii) Time

For the educators, time constraints is one of the challenges that they face when trying to incorporate AIKS into their lessons. With some educators teaching more than one grade and subject, adding onto the already given work requirements is a challenge.

(iii) Curriculum design

Although educators are afforded the autonomy to add on to their lessons, they share that this is not easy, they feel that the way the curriculum is designed is not as flexible as it should be especially for adding AIKS examples into lessons. Lesson plans are already outlined and specific areas must be covered as a requirement before other areas can be added. This in addition to the allocated time for lessons, means educators will focus mainly on what is prescribed and have less to no time for additional material.

(iv) COVID-19 impact

The educators feel that they are unable to think about adding AIKS in their lessons would not be feasible at this point, as it would require more interaction with learners, something that has been hampered by COVID-19.

(v) Support from DBE

Covid-19 has had a negative impact on the education sector. During the sessions with the educators, it was noted that it would be a hard exercise to try and incorporate AIKS in the current curriculum, since learners and educators are already struggling to keep up with what is required. The lockdown requirements have meant that learners do not go to school every day, this has meant that educators need to ensure that they cover the required prescribed material even though the interaction time with learners has been reduced. The impact that the COVID-19 lockdown regulations have brought about for schools that don't have the resources for online learning, is that the learners are behind in terms of the syllabus, placing pressure on both learners and educators.

On this matter, the educators felt that DBE should provide more support when it comes to IKS. The educators indicated that there has not been training provided by DBE on how to incorporate the subject into their curriculum. There are no clear guidelines from policy on implementation.

6.3.4 How AIKS can be made part of the Basic Education curriculum in South Africa

One of the aspects that came out of this study is the fact that South Africa is a very diverse country with different ethnic groups, each with their own language and ways of living. This means that when incorporating AIKS, the question of which AIKS must be included in the curriculum must be considered. Choosing which IKS will form part of the curriculum is part of the first step in deciding how to include the knowledge in schools.

Through the review of the literature as well as the interviews, there were certain findings on how practically IKS can be incorporated into the curriculum especially in South Africa. For example Naidoo (2010) mentions various models for IKS in science teaching that exist in the literature. These include the Five-Step Model proposed by Snively (1995), a Learner-Centred Model explained by Malcolm (2002) and a Research and Development Model that has been proposed by Aikenhead (2002b). In addition to the potential for teaching western science and IKS, these models hold a great level of the culture of learners.

The Learner-Centred Model argues that learner-centred science is evidently diverse and rejects the idea of one science. According to Malcolm, this model can result in more culturally relevant lessons, through focussing on the IKS that the learner brings to the learning environment. These studies have provided a starting point for looking at how incorporating IKS can happen in schools. What is also important to note when including IKS is the crucial part that different role players can play in ensuring the success of incorporating IKS in the classroom. There needs to be buy in from community knowledge holders, family members and the community. Teachers also need to be capacitated through courses and workshops on the process.

Muza (2014) writes about a model of integration of IK and western science proposed by Ng'etich (1996), in which three categories of integration are identified namely integration of one thing into another, integration of one thing with another and integration of one thing and another. South Africa then needs to clearly outline which of these is the intended approach.

From the interview and focus group discussions, it is also clear that there are also non formal ways that can be used in incorporating AIKS with basic education curriculum. For instance, the DBE representative mentioned the school outreach programme that exists, indigenous games and the ABC Motsepe South African Schools Choral Eisteddfod (SASCE). The researcher was also able to see that there are other programmes such as the Indigenous Languages Spelling Bee. The department can also partner with NGO's as part of implementing partners in schools is another way that AIKS can be incorporated. This idea came about when Educator 6 mentioned that at some point Nal'ibali came to the school. Nal'ibali is an isiXhosa term for "here's the story", the programme is a national campaign that promotes reading for enjoyment that aims to stimulate children's potential through storytelling and reading. Founded on the reasoning that having an established culture of reading can be a real gamechanger for education in the country. Children who read regularly and are told stories that are interactive, in languages they understand, are well armed and inspired to learn to read and write. As a means of empowering, teaching, creating identity and encouraging democracy, Nal'ibali fully advocates for reading and writing in mother tongue languages (Nalibali, n.d).

6.4 RECOMMENDATIONS

The previous sections have looked at the overall aim of the study and the findings that emerged from the study. These findings were grouped to respond to the research questions aligned to the study objectives that were stated at the beginning of the study. Based on the findings of the research, the study makes the following recommendations

6.4.1 AIKS content development for primary school subjects

One of the challenges identified by educators was that there is no content in the material provided by DBE that speaks directly to AIKS. They have to use examples of knowledge that they have learnt and remember from their homes and communities. There are no textbooks that also have incorporated such knowledge, for example, if indigenous games, can be used to teach Mathematics, the educators have not found such material in the textbooks.

The DBE needs to make sure that there is explicit AIKS content in the curriculum for all primary school subjects. The content must be included in lesson plans to assist educators to incorporate the knowledge in the classroom. This means that DBE needs to commit resources to the development of such content which will also require not just collecting the AIKS but also documenting it in books and manuals for easy reference. In this regard, DBE can start getting such content from the already existing IKS centres as a start and continue the project from there.

6.4.2 AIKS specific training and workshops

None of the educators from the study had attended any training intended for IKS. The training should equip educators about the overall concept of IKS. Training and workshops should also focus on various AIKS that exists, to help educators understand which local IKS is available to them. Workshops and trainings should also focus on letting educators know the various places they can find more information about AIKS such as the IKS Centres. Training can also be subject specific, for

instance, there could be a training programme specifically for mathematics educators which will inform them on what AIKS can be applicable in their lessons.

6.4.3 AIKS community awareness campaigns and drives

Although communities are aware of certain things that they do as part of their living, having awareness campaigns about AIKS and drives at places like schools, would be an added advantage. This would help communities understand further that what they deem as just a way of living, is knowledge that must be cherished and preserved. This can encourage households and communities to even start documenting their practices. The campaigns can also be used to educate communities about their rights when it comes to their knowledge and how they can even use the knowledge for their own economic benefit. Awareness campaigns and drives at schools should be aimed at creating a space where learners are informed of the benefits of IKS, they should focus on getting learners and educators excited about the prospects of having such knowledge in the curriculum. Another focus for schools is to build respect and tolerance so that when IKS is brought into the classrooms, learners and educators are already aware of diversity of knowledge available and will not be looking down on anyone's knowledge just because it is not from their own ethnic community. These campaigns and drives should be made participatory, where communities and learners at schools are given the opportunity to showcase their AIKS whether music, folklore, games, agricultural and medicinal practices, etc. Learners can even be requested to find out about other African countries and showcase the AIKS of those different countries for learning purposes.

6.4.4 Inclusion of different role players in the process

One of the observations from the study is the lack of correlation between the many role players that can ensure that efforts around IKS in the country are strengthened. In trying to incorporate the knowledge in the curriculum DBE should include more role players in the process such as knowledge holders in the community, parents, IKS bodies across the continent, NGO's, research institutes, higher learning institutions and legal institutions. This will help in streamlining the process and ensuring that it is done effectively. It will help eliminate some issues that might arise during the process

such as legal issues Such as issues of intellectual property rights and ownership, protection against misappropriation of the knowledge and also benefit sharing. Including the local indigenous communities will ensure that there is buy in and will help DBE understand the context under which they would need to include the knowledge and what issues they are hoping to resolve with that. When local indigenous communities are included, it creates the reassurance that their knowledge will not be exploited. Communities can also benefit when their knowledge is used. The involvement of parents is also key, it will assist the teacher's efforts outside of the classroom and motivate learners to take the inclusion of such knowledge seriously as part of schoolwork. Research institutions and higher learning institutions' involvement is also key in providing a body work that has been done in the area and some best practices.

6.4.5 Monitoring and Evaluation systems

It is advisable that the DBE includes targets on their goals for IKS in their strategic documents and Annual Performance Plans. An example would be to put how many schools in a year they plan to rollout inclusion of IKS, then maybe look at the grade to be done in that year and maybe choose a specific subject as pilot. There should also be targets regarding the training of teachers on the subject matter. Having targets only will not be sufficient. DBE needs to also make sure that it develops systems that will track performance of implementation monthly, quarterly and annually.

6.4.6 Further research

From the study the researcher has noted some possible areas of further research. This study focused on the experiences of educators when it came to AIKS. More research can be done on learners' perceptions and understanding of AIKS and its role in their lives. This will be useful in determining what AIKS can be brought into the classrooms as learners share what value they place on the different AIKS they are exposed to in their everyday lives. More studies can also be done on the types of AIKS that exist in South Africa from the different ethnic groups and what similarities are evident. Further research can also be done on the use of AIKS to teach learners at schools on how to improve the socio-economic circumstances, examples of growing their food using

limited resources, food storage practices in areas where there is no electricity etc. The study showed that there are examples of models that exist for incorporation of IKS in the curriculum, it was however not the focus of this study. More research can be done on the viability of the current models for the schools in South Africa and also development of other models that will suit the country's context.

6.5 LIMITATIONS OF THE STUDY

The study was able to arrive at some findings using the educator's experiences from two schools. Although these were useful findings, using only two schools was limiting, having only two schools meant that the variety of opinions was limited. Another challenge was that the sample was not representative enough of the different subjects that are taught at primary schools, mostly the subjects represented were the languages, Life Skills and Mathematics. This means that experiences of educators teaching subjects such as history, geography, natural sciences etc. have not been included

6.6 CONCLUSION

This final chapter sought to provide a summary of the study which aimed to find out what experiences in incorporating AIKS into the Basic Education curriculum for two South African schools, in Gauteng and KwaZulu-Natal Provinces respectively have been. The study used the following sub research questions to understand *'What have been the experiences in incorporating AIKS into the Basic Education curriculum for two South African schools, in Gauteng and KwaZulu-Natal respectively?'*

- What types of AIKS form part of teaching in the selected schools?
- What are the prospective benefits of incorporating AIKS into the formal school curriculum?
- What are the challenges faced in the incorporation of AIKS in the Basic Education curriculum of the two selected cases?
- How can AIKS be made part of the Basic Education curriculum in South Africa?

In order to achieve this, a qualitative study was employed, informed by the Systems and Symbolic Interactionism theories. Two schools were purposively sampled and focus group discussions conducted with educators. A semi-structured interview was also conducted with a DBE representative.

Through the literature review, focus group discussions and interview, the key findings that the study arrived at include: Firstly, that educators that are trying to include AIKS in their classrooms are relying mainly on their own knowledge and not from textbooks. The main AIKS that was being referred to, was indigenous games, folklore (which takes into account, idioms, myths and proverbs) and traditional medicine. Secondly, there are benefits that may result from incorporating AIKS in schools. Incorporating the knowledge will ensure that learning is inclusive of different knowledge systems, that may result in promotion of diversity, may promote creative thinking in the classroom, promote pride and Ubuntu principles. The knowledge can be used by learners to navigate their different socio-economic challenges. The third finding is related to the challenges that the educators experience in trying to incorporate AIKS in the curriculum, in summary these include the time constraints, lack of IKS material, curriculum design, lack of support and guidance from DBE and the impact of the COVID-19 pandemic on learning. Fourthly, some models from the literature that spoke to how the incorporation of IKS can be achieved were reviewed. The Models include: The Five Step, Learner-Centred and Research and Development models. For the case studies, the findings indicated that other informal ways could be adopted such as using programmes that the DBE has for example, the indigenous spelling bee. Likewise, NGOs can be used to rollout some AIKS projects in schools.

Some of the themes that emerged from the study include: AIKS and the rural context, indigenous games, Folklore/storytelling, traditional medicines, restoration of pride and ubuntu, sustainable livelihoods etc. Several recommendations have been made which have been informed by the general findings of the study. These include the development and recording of AIKS content for schools, AIKS specific training for educators, campaigns that will create awareness and buy in for AIKS in schools. There should also be involvement of different role players such as community knowledge holders, in this drive of incorporating AIKS in schools, clear targets should be set out

by DBE and monitoring and evaluation systems developed. Finally, the study has indicated possible areas for further research in this field, for instance looking at learners' perspectives on AICS, the development of different models of implementation and also how AICS can be used to improve livelihoods of learners and their communities.

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