



UNIVERSITY OF NAIROBI

**A CRITIQUE OF COMPETENCY BASED CURRICULUM: TOWARDS INTEGRATION OF
INDIGENOUS KNOWLEDGE SYSTEMS IN KENYA**

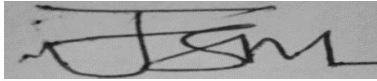
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REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF EDUCATION IN
PHILOSOPHY OF EDUCATION OF THE UNIVERSITY OF NAIROBI**

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DECLARATION

This project is my original work and it has not been presented in any other institution or University for academic credit



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Date 10/11/2020

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The project has been submitted for examination with our approval as University supervisors

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DEDICATION

I dedicate this report to my brothers and Sisters Carolyne Simwenyi, Knight Simwenyi, Margaret Simwnyi, David Simwenyi, My father Aineah W. Simwenyi and mum whose motivation, love, encouragement, support, and prayers always gave me a reason and hope to work harder.

Abstract

The indigenous knowledge systems (IKS) discourse has incited an epic proportion debate all over the world for several years. In Africa, especially in the sub-Saharan region and particularly in Kenya, the so-called indigenous communities have always found value in their own local forms of knowledge even, though, curriculum developers, post and pre-colonial administration viewed IKS as anti-development, ungodly, unscientific, and/or illogical. The importance and status of IKS have changed in the wake of global knowledge yet, little has been done, especially in sub-Saharan Africa and mainly in Kenya, to guarantee the maximum exploitation of IKS for the common good of all persons. The Kenyan new competency based curriculum (CBC) and most curricula in sub-Saharan Africa are aimed at promoting education for sustainable development as an alternative approach to school. To address some of the knowledge deficiencies that are currently formulated from the western perspective, this study focused on the integration of existing IKS within the country into the CBC in Kenyan schools. The objectives of this study were to explore the role of indigenous knowledge systems, provide critical analysis of the CBC to assess the extent to which indigenous knowledge systems have been integrated into teaching/learning in the Kenyan formal school system, and propose a working paradigm of introducing indigenous knowledge systems in teaching/learning in our schools. The study adopted the holism theory to achieve these objectives. Critical analysis and constructivist models were used to assess the role, integration, and suitable paradigm for the integration of IKS in teaching/learning in Kenyan schools through the CBC. The solutions to problems that currently plague the African continent and that concern the Kenyans must proceed from their understanding of local values such as the role of IKS in education towards promoting sustainable development in the country. This can be achieved by integrating IKS into the Kenyan formal education curriculum to address some of the deficiencies in knowledge for development that is currently formulated using the western perspective. This study challenged the dominance of western knowledge in Kenya's school curriculum that makes education disembodied from context. Findings indicated that the CBC recommended the teaching of Indigenous Language Activities (ILA) which is a sub-set of IKS and thus full integration of IKS into the curriculum was missing in the Kenyan educational curricula. A total focus of the curriculum in terms of IKS is recommended by this study to de-racialize African educational systems, provide a basis of problem-solving and innovative thinking strategies, generate and motivate learners' interest and self-consciousness, promotion of interaction and development of different cultural dimensions, and promote interpersonal relationships in Kenya. It is further recommended that the exploration of the indigenous knowledge systems should be part of the curriculum design process and IKS should be integrated into the school and University curricula for a clear understanding of concepts and for long-term retention of what is learned in class. Further research should be done in order to assess the perception of teachers on IKS and find ways in which IKS can blend with modern technology to solve current problems.

Key Words: *indigenous, indigenous knowledge systems, curriculum, integration.*

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ACRONYMS AND ABBREVIATIONS

APA:	American Psychological Association
CBE:	Competency Based Education
CBC:	Competency Based Curriculum
IKS:	Indigenous Knowledge Systems
ILA:	Indigenous Language Activities
KICD:	Kenya Institute of Curriculum Development
KIE:	Kenya Institute of Education
MOE:	Ministry of Education
PBE:	Place Based Education
UNESCO:	United Nations Educational, Scientific and Cultural Organization
UNO:	United Nations Organisation
UPE:	Universal Primary Education

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The study sought to utilize philosophical theories and methods to provide a critique of the Kenyan education curriculum, mainly the new progressive Competency-Based Curriculum (CBC) in light of the application of indigenous knowledge systems (IKS) which cuts across all cultures and communities. Such theories and methods that are the subject of discussion in chapters two and three include holistic, communalism, constructivism, critique, analysis, and the Socratic questioning, among others.

Education is the most important tool which can liberate people from their natural negative states, whether from diseases, poverty, fear, selfishness, injustice, corruption, moral bankruptcy, and enslavement among others (Kessio & Changach, 2012). Education aims to facilitate one to demonstrate the abilities and potentialities already inherent in them and it is in this sense that context is very important (Peters, 1967).

Competency-Based Curriculum (CBC) refers to the systems of grading, academic reporting, and instruction that are grounded on learners' ability to demonstrate having acquired the skills and knowledge which they are assumed to have learned through the education continuum (KICD, 2017). It emphasizes knowledge, skills, and attitudes (competencies) as applied to real-life situations and hence are meant to promote indigenous knowledge systems (IKS).

IKS are the cumulative practices, tools, strategies, explanations, cultural values, intellectual resources, techniques, and beliefs of a set of persons over a while in a specific locality with little impositions and interference from outer forces (Emeagwali, 2015). IKS refers to the way of learning and teaching which are based on accumulated indigenous knowledge over a period by

Africans responding to their various economic, ecological, language, physical, socio-cultural, and political challenges (Emeagwali, 2015). The overall aim of IKS in education practice is grounded on the economic and socio-cultural features which many communities share. Its aim has survived in Kenya albeit not been given due attention by the previous curricular reviews (Owour, 2007). Within IKS, every attitude, knowledge, or skill learned is for ensuring societal continuity and managed security systems (Shava, 2016). IKS also helps to create consensus and unity in a community to sustain heritage, culture, and the societal ethic, protect its boundaries, and mold the youth for their adult roles (Msila, 2016).

Senanayake (2006) observes that across the globe, interest in IKS is increasing where the western form of education has failed, to eliminate issues such as illnesses, poverty, and hunger among others. Education is seen as a development of the nurtured and natured capacities of individuals to help them fit into the society in which they are full-fledged members (Balogun, 2008). It is an activity that transmits fundamental factors of social change and involves the training of young persons and the molding of children of the nation to make them responsible adult members of their respective societies (Balogun, 2008). Therefore, education cannot be associated solely with schools and colleges; it is a continuous process throughout one's life. Education is a discipline, an enterprise, a system, a channel, and a way of life. Peters (1967) defines education as an activity that provides criteria to be confirmed by anyone of a family of processes. If one or more of the criteria is absent in an activity or process then it is not educational (Peters, 1967).

According to Peters, an educational process must involve: Some understanding and knowledge, an initiation into worthwhile activities to bring desirable change in one's state of mind and dispositions; a deliberate and intentional change that is directed towards a purpose. Skills or knowledge 'inherited' in a manner that is morally acceptable. Students, therefore, should not be

deceived or forced to learn and the content also should fit the level of intelligence and understanding of the learner (Peters, 1967).

In Africa and Kenya in particular, education concerning IKS for the youngster should involve physical, attitudinal, and intellectual training towards developing fully into acceptable adult members of the society (Adeyemi & Adeyinka 2002). Various games include wrestling, athletics, pieces of training for how to live a healthy life, dressing, home-economics, farming, gathering/hunting, drumming, blacksmithing, carpentry, dancing, counseling, critical thinking, and marriage among others, form part of the IKS curriculum for youth at different stages. In Kenya, according to the CBC, it is only athletics, manner of dressing, counseling which is to be part of co-curricular activities and indigenous language activities (ILA) as a part of the curriculum in lower primary. The greater part of IKS, therefore, missing in the CBC.

Assessment and Curriculum Statement Policy (2012) that was implemented in South Africa stated that IKS ought to be integrated into the curriculum to be effective (Beer, Cronje & Ankiewicz, 2015). UNESCO in the 2014 world education conference for sustenance in development praised South Africa nation for being among a few countries which had made serious moves in matters of Education for Sustainable in Development (ESD) in the past years (UNESCO, 2014). This advancement was attributed to the reaffirmation of the role of IKS regarding care and sustainable living for the well-being of tomorrow's eco-systems

IKS was strictly introduced to nurture the children as they grow for future roles in society. Girls and boys were separately taught in preparation for their roles as adults. At the top level of Africa, Indigenous Knowledge System was the accrual passage ceremony from childhood to adulthood. For instance, circumcision marked the end of celebration for societies that practiced initiation practices, mainly for boys (Kanu, 2015). These practices were wide-ranging and have been

recorded among such ethnic groups as the Maasai of Kenya and Tanzania, the Nandi of Kenya and Sidamo of Ethiopia among others (Msila, 2016) but the education curriculum of these countries have not infused the practices in teaching and learning.

IKS contains a very important 21st-century skill-set for global citizens because it makes an individual have holistic education if curricular and pedagogic intentions are translatable into learners' experiential competencies (Owour, 2007). While IKS in Kenya is meant to prepare the youth for adult life, efforts by the Kenyan government to integrate IKS in curricular had been happening in an environment that had given the privilege to Western epistemologies (Msila, 2016). Consequently, it has been very challenging to implement IKS in the curricula. This situation has continued to bring about the hegemony of knowledge construction in Kenya's schools, and therefore, efforts to indigenize the Kenyan curriculum have had minimal success. Thinking from IKS would change our focus on some of our intractable problems (Yunkaporta, 2019). Msila contended that there was a disconnect between what is implemented during teaching and learning, and what the curriculum reforms intend to be achieved in the classrooms, thus leading to a parallel between learners' experiential knowledge and the expected school formal knowledge (Msila, 2016). Indigenous culture and in our case IKS has designated thousands of years ago to deal with cultural problems and communities upon which education is born (Yunkaporta, 2019).

A report on the task force by the ministry of education (2012), the Kenyan government decided to take action and came up with a plan to reform training and education (the Republic of Kenya, 2012). The reports proposed that the national philosophy should guide the education sector to place education at the center of Kenya's economic and human prosperity. Some of the aims were as follows: Develop the potential of an individual learner in a holistic manner while producing emotionally, physically, and intellectually balanced citizens. Learning and teaching concrete skills

(IKS has those skills) instead of abstract ideas should be emphasized. Establish a national system of assessment that caters to the continuous evaluation of learners. Create structures to identify and nurture children with talents from a young age. Introduce national value integration and cohesion into the curriculum. Emphasize technology, innovation, and science (KICD, 2016).

These aims highlight the issues that have led to the Competency-Based Curriculum (CBC) implementation to address the shortcomings of the 8-4-4 curriculum. The CBC was expected to address the recommendations that required the curriculum to embrace differences in the ability and learning styles of learners and ultimately enable each learner to realize success and fulfillment through the exercise of their individual capacities. These efforts set the stage for the conceptualization of learning areas that would integrate rural development in the overall national development plan, create employment, and promote income and equity (Republic of Kenya 2012).

Although CBC is being adopted with an aim of improving the quality of education at all levels in ways that will address emerging issues of the 21st-century like drug abuse and social networks among others, IKS is yet to be given due attention. For instance, at lower primary school, one of the learning areas in the CBC is the Indigenous Language Activities (ILA) (KICD, 2017) which is a sub-set of Indigenous Knowledge Systems (IKS) communicate valuable cultural norms and values in the language of catchment areas (KICD, 2017). Such include speaking, listening, reading, and writing within the community in question. Our colleges too, rarely train tutors on how to infuse IKS into teaching/learning and this is the reason why it'll be even difficult to teach ILA which is a sub-set of IKS. Emeagwali (2015) and this study supports a curriculum whose ideals would foster social-cultural development and intellectual research-oriented mind. African games such as wheel targeting, swimming, cooking style, and boat competition, which are practiced within communities can make learners learn from what they already know to what is unknown. Learners can do

research to identify more games in particular communities that can enhance social integration. The intellectual development of the learners could result from learning names and values of indigenous flora and fauna, which are not catered for in the new CBC (KICD, 2017). African economic activities such as farming which partly depend on indigenous ways of weather forecasting should also be included in the CBC. Such a curriculum constitutes the main asset of IKS, not just language activities as seen in the CBC. Accumulated IKS has not been accorded as high a value concern, a situation that this study addresses.

1.2 Statement of the Problem

The new Competency-Based Curriculum (CBC) in Kenya has not specifically integrated Indigenous Knowledge Systems (IKS) such as African games, names, and values of indigenous plants and animals, and traditional methods of weather forecasting for economic and agricultural activities. All these can enhance learning from known to unknown. This study intended to critique the new CBC against what is contained in IKS which should form an integral part of Kenyan education. A proposal for possible adoption of the CBC or the 2-6-6-3 system of education with integration of African IKS pedagogies is what this study attempted.

1.3 Research Objectives

1.3.1 General Objective of the Research

The research sought to utilize philosophical methods to provide a critique of CBC in Kenya with a view to integrating African indigenous knowledge systems into Kenya's Competency-Based curriculum.

1.3.2 Specific Objective of the Study

The specific objectives of the study were:

- i. To demonstrate the need for African IKS in the well-being of an individual and societal development.
- ii. To analyze and philosophically critique the Kenyan education curricula (CBC) to assess the place of African IKS.
- iii. To propose a methodology for infusion of African IKS into the Kenya Competency-Based Education curriculum.

1.3.3 Research Questions

- i. What is the contribution of the African Indigenous Knowledge System for individuals and society?
- ii. What is the place of IKS in the Kenyan Competency-Based Curriculum (CBC)?
- iii. How can African IKS be integrated into the Kenyan Education Curriculum?

1.4 The Significance and Purpose of the Study.

This study aimed at critiquing what is contained in the new CBC against what is contained in the IKS in some selected communities in Kenya to find an appropriate way of making IKS an integral part of the Kenyan education curriculum. Resources in African IKS are deemed invaluable in making Africa independent educationally.

The main purpose of this research was to assess the contribution of African IKS resources as an alternative to educational development. Understanding is required for a realization of the capability of IKS in communities' development process through education. The recommendations and findings of the proposed research might be significant in informing education planners, curriculum designers, practitioners, and policymakers on alternative pedagogical approaches for the achievement of the objectives of CBC.

1.5 Delimitation of the Study

The proposed research employed philosophical methods to offer a critique of CBC to have it enriched by the integration of pedagogies of Indigenous Knowledge Systems through the constructivist approach. The reports focused were the KICD 2016, 2017, 2018; task force reports 2012, 2013; sessional paper No. 1 of 2005 and 2015 in addition to other educational reform documents on CBC.

1.6 Study Limitation

There was limited research, findings, and recommendations linking African IKS to CBC. This will overcome such shortfall in literature by attempts to derive CBC practices from the practical experiences that emanate from IKS in general and African IKS, in particular.

1.7 Assumption of the Study.

The research had assumed that integrating the African indigenous education in CBC will enable achievement of the experiential objectives desired of the Competency-Based Education. It sees IKS as the way forward that shall help in solving the problem of poor expression of autonomy and unemployment in Kenya. It is envisaged that infusion of IKS to the new curriculum will lead to a holistic learner through reformed knowledge management, teaching, and learning.

1.8 Scope of the Study

This research revolved around the CBC curriculum and how it may be addressing the issues that are inherent in indigenous knowledge systems in Kenya as it continues to be implemented. It is notable that since 1963 at Kenya's independence, all education reforms have not been able to

eliminate issues surrounding examinations orientation of curricular and individual competencies to achieve innovativeness and personal self-reliance on the products of education.

1.9 Definition of Terms

Indigenous: Fixed patterns of whereabouts of a people comprising a community, level of locality, distinct in terms of cultural attributes.

Indigenous knowledge: Defined as practices, cumulative strategies, techniques, explanations, beliefs, tools, and values of a society over a time with less imposition and interference from external forces.

Indigenous Knowledge System: Is a set of intellectual resources, practices, strategies, values, and cultural beliefs that define a community or a people and kept over time with little or no imposition and interference from external forces.

Curriculum: Are knowledge, skills, competencies, and dispositions that learners are expected to acquire and demonstrate in an organized learning environment. It includes employment and application of various resources that include print, electronic, oral, and social media, virtual deliberations, presentations, assessment rubrics, and other methods used to examine and evaluate students learning.

1.10 Organization of the Study

Chapter one of the study was the introduction which provides the statement of the problem, the objectives, research question, and the background of the study. It gave an overview of the direction the research will take. This section also stated the significance and purpose of the research, scope, and limitation of the research, and definition of terms operationalized in the study.

Chapter two reviewed and provided a critique of the literature related to each objective of the research. By doing a critical analysis of the literature, the study identified gaps associated with the objectives and which necessitated the research by identifying possible inadequacies, irrelevance, incoherence, or inconclusiveness of the existing situations in the related literature. Chapter three discusses the methodology used in the research. In this section, the research employed appropriate philosophical research methods to achieve the stated objectives. Critical analysis and analytical methodologies had been selected as appropriate for this study. The critical analysis used rules of deductive or inductive reasoning to assess whether the arguments or results were probable or valid.

Chapter four seeks to do a philosophical assessment and analysis of the status of IKS in the schools in Kenya under the 2-6-6-3 curricula. Critical analysis and critical pedagogy informed the assessment. The chapter also sought to assess how attempts at integrated approaches to IKS have performed in the learning and teaching in Kenya schools. A working paradigm was suggested to help in the infusion of IKS teaching and learning in Kenyan schools. It is in this regard that holistic theory and other philosophical thought informed the study. Chapter five presented the synthesis, discussion of research findings, and propose a working paradigm for infusion of African IKS in the education curriculum. And finally, chapter six gave a summary of the research, recommendations, and conclusions.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter reviewed related literature on nature and the need for the IKS in the Kenyan education curriculum concerning the CBC curriculum. It also analyzed and assessed the literature behind the status of IKS in the Kenyan education curriculum right from 1963. Finally, the study looked into the existing literature and proposed a working methodology for integrating IKS in the Kenyan formal curriculum.

2.2 The Need for African IKS in the Well Being of an Individual and Societal Development

Sillitoe (1998) noted that IKS refers to various ways not limited to but including local, technical, peasants' and environmental traditional knowledge. Battiste (2002) looks at IKS as distinct to every social or cultural institution and can be found in practices of a community, rituals, and relationships and held commonly by communities, not individuals. Vhurumuku & Mokeleche (2009) and Khupe (2014) look at IKS as a philosophy with epistemology and ontology. These sets of understanding, meanings, and interpretations encompass naming, classification and language systems, ritual, world view, and spirituality. Menkveld and Bitzer (2004) also believe that IKS is a philosophy, a knowledge system, and is critical for learning/teaching in schools, social, economic, and legal civilization. Within the Kenyan communities exist those aspects of IKS which can be infused successfully into the school curriculum during teaching and learning.

IKS is contained in cultures of the people and it is symbolized by an understanding of the behavioral patterns of a set of people (Shizha, 2009). IKS is maintained, retained, and transferred for sustainable and holistic education (Shizha, 2013). In European thought, it is a body that relates to obsolete and old information; it may still be a wonderful tool to the environment of education

for learners (Waweu, 2011), informs of how the past informs the present and provides insight for the future. Battiste (2002) believes that to understand IKS is to find the best way to relate indigenous and Eurocentric education by blending educational context that builds and respects both western and indigenous systems. IKS is practical in nature and applies tools of knowledge obtained from the immediate environment, hence, holistic in nature. If utilized in the CBC it would train learners on how to be independent, how to search for knowledge, and be open-minded/free to interact with their environment for knowledge.

Woolman (2001) noted that indigenous knowledge integrates intellectual training, character-building, physical education, and manual activities. The content included all of the rituals, skills, and activities required to sustain the life and culture of the community and family. This means that IKS placed great importance on reciprocal obligations and interpersonal relationships. Fafunwa (1974) recalls, in traditional Africa the man who combined a specific skill with the good character was adjudged to be a well-integrated and well-educated citizen of his community, as trades were learned by the apprenticeship system. This marks the difference between Eurocentric education, which emphasizes competitive individualism as it eliminates learners through test failure, and African IKS education, which emphasizes communalism as it tries to include all learners in the community. Yet the role of education as a force that promotes relationships of interpersonal remains critical.

2.2.1 IKS and Education

Education is the primary instrument of enculturation in all its forms and must be designed and implemented right. Escrigas (2016) notes that schools have a great influence on improving society through educational reforms. Education is a tool, and a prerequisite for improving opportunities for students to exercise cultural, social, political, and economic rights (King & Schielmann, 2004).

Education ought to be given to students who understand their cultural traditions and willing to demonstrate and understand ways in which their local knowledge and situation compare to other cultural beliefs and education (Barnhardt, 2014). Education can perform a useful role to counter colonization of the mind of Africans and in our case Kenyans, sustained by post-colonial legacies in the form of education emphasizing Euro-American epistemologies (Brock-Utne, 2006). It is therefore important to include IKS in the curriculum so that learners can be able to learn about their culture which is fading day by day with western education. The current 8-4-4 and 2-6-6-3 curriculum as it is has put a lot of emphasis on foreign languages (English and Kiswahili) ignoring local language and culture.

Blignaut (2017) points out that education ought to create individuals who are autonomous, able to make ethical decisions and judgments, and who can think for themselves. This happens to be contrary to our education systems including the CBC since they are teacher-centered (KICD, 2017). Consequently, education programs require a well-formulated system to be learned and taught in community language to builds upon the existing IKS (which is key to this study) and the experiences of the learners and teachers in the community (UNESCO, 2000). It is notable that IKS is in places that offer lessons that can benefit everyone in the locality in ways that are sustainable and satisfying needs within the said community (Barnhardt & Kawagley, 2005).

It is not advisable to ignore the role IKS play in children, even though society is fast changing. Children (in this study, Kenyan children) already know beliefs, practices, riddles, proverbs, stories, play, and games, given the fact that knowledge is socially constructed (Okoth, 2016). According to holism theory, children can actively build their Knowledge (Lunenburg, 1998). Learning should extend beyond the reproduction of what the teacher requires in examinations to facilitating subject

matter in learning and demonstration of competencies through IKS (Abah, Mashebe & Denuga, 2015). IKS contains unavoidable and critical part of a very comprehensive and realistic education curriculum just as Assie-Lumumba (2016) focuses on learners' experiences and competencies as generated from a reflection on cultural and social contexts that meet the current needs of an individual in the community (Shizha, 2013). Kenyan learners too have the potential to create knowledge from the experiences gathered/accumulated within their communities.

If education is the accumulated knowledge of the society and transmission of values (Zulu, 2006), then it is not limited to the number of skills and knowledge; rather it is acquiring systems of giving meaning and interpreting concepts, understanding ideas, and forming links. It entails perceiving, interpreting ways of the dynamic world (Shizha, 2013) and helps form new communities, and produce various dynamics, to allow and to generate intellectual challenges (Assie-Lumumba, 2016). Education needs to promote creativity and innovativeness by the demonstration of a positive attitude and personal competencies.

For any nation (Kenya not an exception) to develop, education is the key. Education reforms ought to be inclusive, owned by stakeholders in ways and styles they learn readily, adequately financed, clearly planned, and protected from political dictates for it to play its role (Chang'ach & Muricho, 2013). This is a challenge to our education systems (CBC and 8-4-4) because they are dictated by politicians (Otiato, 2009) and those in power, making it difficult to infuse those skills which can benefit the society and an individual such as IKS.

2.2.2 IKS and Issues of the Curriculum

Curriculum as a vehicle for education forms a link between knowledge, institutions of learning, and society (Gumbo, 2016). Changes in knowledge discourse are a product of changes in the curriculum (Dyck, 2005). Quite often curriculum is the means to ideological indoctrination, control, cultural superiority, and power over others (Kanu, 2008). Emeagwali (2015) supports a curriculum whose ideals would foster social development and intellectual research-oriented mind. Such a curriculum constitutes the main asset of the poor and is the most important element of their social capital in the struggle to manage lives on their own. IKS in our view is an ingredient of social and intellectual development.

For African knowledge, education to be successful, it ought to look at local knowledge and contexts which are relevant to withstand the challenges of the global economy which is rapidly changing (Msila, 2016). It is notable that curricula, both in pedagogy and content in sub-Saharan Africa still teach a worldview of the western culture, and do so in western languages that hinder students' learning experiences (Shizha, 2013). Shava, (2016) observes, that accumulated IKS have not been accorded as high a value concern. Exclusion and marginalization of IKS have taken place in the westernized school context, supported by African tutors who were taught on western curriculum (Odora-Hoppers, 2004). Our Kenyan colleges rarely train tutors on how to infuse IKS into teaching/learning and this is the reason why it'll be even difficult to teach ILA which is a subset of IKS.

The political elite in sub-Sahara Africa has taken for granted the collective knowledge on IKS (Shizha, 2013) by perpetuating foreign instructional languages, for instance. One major challenge of research and education in Africa is the attempt to give due attention to the value of African

languages, cultures, practices, and customs in the curricula (Matos, 2000); all these are done in foreign instructional languages. Despite many debates over the years on the importance and need for integration of IKS, formal education, other than the proposed CBC was/is still academic in orientation and western-centered in outlook, reflecting foreign scientific cultures (Abah, Mashebe & Denuga, 2015). The consequences of this trend which is similar to most African countries Kenya being one of them is the neglect of IKS, examinations oriented curriculum that is un-transformative (KICD, 2016) thus inhibitive to creativity and innovativeness.

2.2.3 Education and African IKS

African elites are acknowledging the need for integrating IKS into the school curriculum (Msila, 2016). There are specific and generalized IKS components held in African communities (Shava, 2016) and these are shared asymmetrically based on age group and gender. They include making craft wear, collection, hunting, traditional medical practice, preservation, and preparation of food among others. Atte (1992) highlights, local farming methods that include harvesting and cultivation of yam, barley, cocoa, coffee, and the practices of domestication of cattle as well as cropping systems. Astronomical technologies of ancient people of Turkana, for instance, are among IKS in Kenya (Van Sertima, 1991). Local indigenous vegetables and fruits exist that can be studied in Kenyan schools. However, 8-4-4 which is being phased out, and the CBC curriculum on agriculture topic of vegetables and fruits focuses mostly on exotic fruits, food, and nutrition on dietary at the expense of local or indigenous varieties and this cut across most subject disciplines (Shava, 2008).

2.2.4 Issues of IKS in the CBC

The constant and rapid adjustments in our societies require a student who shall give answers to the current and future challenges (Msila, 2016). In Kenya, the policies governing curriculum

reconstruction to embrace attitude change towards values concerns and innovativeness haven't been done with success (the Republic of Kenya, 2005). The Colonial schools caused the collapse of IKS voices, self-confidence, and self-identities (Shizha, 2013) and, there has been little or no effort to revive and grow the African IKS in African in general and Kenya in particular. The formal education curriculum in Africa (even our CBC) has remained Euro-centric to date in terms of knowledge systems (Shava, 2016) accompanied by an unwillingness to apply and represent community education within formal socio-economic and education contexts. Consequently, there is a lack of our contextual relevance of westernized education systems in Africa and the role of community knowledge (Shava, 2016).

Although the reclamation of IKS may be frustrated by globalization in the school syllabus, there are global voices that attempt to support and reclaim programs to support IKS worldwide and in sub-Saharan Africa (Shizha, 2013). African IKS has evolved into contemporary forms as it predates colonialism in its origin (Hewson, 2015). There is a need, therefore, to utilize the richness of local IKS and to integrate them to be part of the formal education curriculum and use them to solve problems that exist in society (Msila, 2007).

There is a need to Africanize higher education by adopting teaching pedagogy geared towards the cultural and physical realities of the African (Letsekha, 2013). It is in this regard that Seepe (2000) argues for a radical reconstruction of African education. Shava (2016) observes that this is the way to decolonize education systems in Africa through the application of principles of IKS to develop curricula that meet local needs. The call for Africanization of education is hope for integration of IKS (Letsekha, 2013) holistically and selectively to develop systems of education with structures, organization, and content aligned with African needs, worldview, and social systems (Assie-

Lumumba, 2016). Kenya too is rich in local culture cutting across; language, molarity, economic, spiritual, and political aspects which can be integrated into the curriculum to promote IKS.

2.3 Analysis of IKS in the Kenyan Education Curriculum

For over fifty years after Kenya's independence, western values still dominate the systems of education, thus perpetuating the confusion that relates to the benefits of IKS in values concerns, research, and development. Additionally, stakeholders in education have problems in coping up with the obligations and demands of IKS practices vis-à-vis the expected global commodification, commercialization, and economies of knowledge. To date, Western domination in knowledge and development still dictates the way education systems and curriculum are supposed to move (Mwenda, 2003). Mwenda's observation is still a reality in the Kenya of today since the curriculum is dominated by European languages such as English and French and cultures through the manner of dressing, talking, and games (KICD, 2018). The resultant effect is that an education system is a form of government mentality made of individuals who absorb ideologies that are dominant to make pictures that are imaginary of prosperity covered in styles that are foreign (Mwenda, 2003).

At Kenya's independence, attempts to integrate IKS in the English education model brought about great problems to the process of implementation. Policymakers and curriculum developers then had little capacity to incorporate the pure African vision. The existing teaching force had not evolved to provide the necessary mechanism and input required to integrate the African IKS into the education curriculum (Lillis, 1985; Ominde Report, 1964). Lack of capacity of educators trained in IKS from 1963 through to 2018 when the 8-4-4 was proposed to be phased out in favor of the CBC curriculum has become an impediment to the implementation of the education system (Msila, 2016). The one promising aspect of CBC is that it has introduced the indigenous language activities (ILA) in teaching and learning at lower primary as a way of promoting IKS (KICD,

2018) even though, lack of trained teachers of ILA remains a challenge. Failure to agree on principles for validating and recognizing the role of IKS, innovation, and indigenous practices are additional challenges. The situation in Kenya to date has not changed much and organized curricula that are based on the Eurocentric economic model contradict the expectations of the CBC approach in which learning should be informed by indigenous or current socio-economic activities (Msila, 2016; Mwenda, 2003). Incorporating IKS in current pedagogies would, therefore, involve fighting the existing Eurocentric dominated culture (Waghid, 2004).

2.4 Paradigm for Infusion of IKS into the Kenya Competency based Curriculum

The place of IKS in the setting of education can be attained if the energy is put to find possible areas of its infusion into the current education curriculum. The strategies for infusing IKS into the CBC or Kenyan curriculum demands that one uses a local approach to learning that requires integrating IKS with other useful and relevant knowledge (Owour, 2007). The use of a local approach to learning in Kenya for learners in metropolitan and cosmopolitan schools is a challenge but, efforts should be made by policy and curriculum developers to find a way of infusing IKS into regular learning.

African renaissance is closely connected in a cultural sense with the re-validation of IKS (Letsekha, 2013). Educational approaches should encourage the learners and be contextual to share and bring in the learner experiences into the learning situation (Shava, 2000). Semali and Kincheloe (1999) observe that by letting learners come to school with their local literacy skills and by acknowledging students as knowers, the classroom becomes an interactive community of knowledge where they become producers of knowledge which involves both teachers and learners.

The education curriculum needs to be reformed to make it suit the needs of Kenyan society (Changach & Muricho, 2013). Botha (2010) noted that education which is inclusive and that recognizes the importance of African culture and traditions, where IKS and knowledge of the West are put together would be the most relevant. Such would include, diverse cultures, geography, histories, oral literature, and innovativeness of the communities from which learners are drawn (Owour, 2007). Many types of research, together with this study, have lauded the usefulness of IKS, and why processes of education should be properly situated within the IKS and ILA. It is important for IKS to be on the same level of comparison with the epistemological systems of others in an effort to meet substantive and formal equality.

IKS is built-in literature and culture. Its impact on school teaching/learning is of great importance, and it is a strong tool for teaching (Shizha, 2013). Planners of the CBC are called to integrate into the school curriculum content with the dominant IKS found in indigenous communities both in pedagogy and content in order to build cultures of local people through classroom practices.

2.5 Theoretical Framework

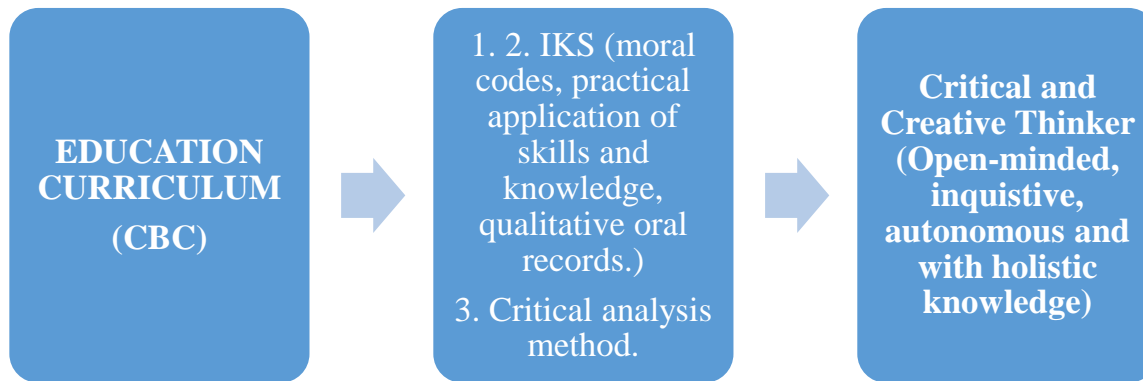
To understand the place of IKS in the Kenyan CBC, Holisticism (or Holism) worldview will be used. Holism is an epistemological ancient term whose origin is in the Greek word *holos* (meaning “entire, whole, all”). Holism, a theory with contemporary application posits that parts of a whole are in interconnection which is intimate. Parts, cannot independently exist of the whole, or cannot be known without referring to the whole (Hewson, 2015). Christakis (2012) argued that ‘whole’ have being and value which is inherently different from and cannot be reduced to, the sum of their individual parts. It should be seen as wholes, from whichever system of reference, not just as parts put together (Oshry, 2008).

Regarding education, and in our Kenyan Competency-Based Education Curriculum, holism will serve as a facet of an African IKS which approves a learner who is all-round in terms of life, ranging from cultural traits, political frame, economic character and social features (Kaunda, 2019; Mwinzi, 2015). In other words, African IKS focuses on learning holistically or in totality, that is, students are prepared in diverse fields of life or are taught to be all-round (Kaunda, 2019). Learners can specialize only after acquiring all the basic skills, values, and knowledge required of them by their society. Based on this assumption, it can be stated that IKS requires learners to acquire multiple skills as mentioned and master them all.

There is value, the theory suggests in considering elements/factors that influence a phenomenon together as integrated wholes, in addition to consideration of individual components (Michaelson et al., 2006). In this study, IKS is part of education, and it should not be excluded or part of it as noted in CBC during implementation where only the ILA is taught. This implies that in education, children should be taught ‘all’ or ‘entire’ aspects that impact their lives and research should equally impinge on the same issues.

2.6 Conceptual Framework

The conceptual framework depicts possible relationships between indigenous knowledge systems, CBC, and methods used. It is believed that if IKS is blended with the existing knowledge systems, more so, the newly introduced 2-6-3-3-3 or CBC in teaching and learning, the education system will bring about learners who are creative, critical thinkers with open-mind, inquisitive, autonomous, and having holistic knowledge as shown below (Msila, 2016).



2.7 Conclusion

IKS, if well infused into the syllabus, the literature indicates that it can immensely contribute to the teaching/learning process of the people of Africa and Kenya as much as a modicum and value of respect are given to them. The relevance of IKS to the process of learning of children in Africa should not be underestimated. Yet, the full recognition of IKS can only be realized if it is implemented fully in academic curricula and if its purpose is made popular. The literature offer insights which is valuable into the ongoing education system that maybe a guide for constructive and reformed education in Kenya. IKS, as long as it fails to find full realization within and integration which is real into the curricula and the mainstream discourse in knowledge, the lofty pan-Africanism of self-sustaining development, economic growth, and collective self-reliance will remain dreams which is unrealized. Therefore, the infusion of IKS as a whole into the CBC curriculum is what the study proposed.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter was a summary of the methods used for conducting research related to the philosophical critique of IKS in Kenya's CBC. This research intended to test the assumptions that adopting explicit instruction of IKS will bring about holistic education and in the end breed enlightened, critical, and open-minded individuals. Critical analysis supplemented by analytical method greatly helped to achieve the stated objectives of the study.

3.1 Critical Method

The term critical comes from the Greek word *Kritikos* which means judging skillfully (Njoroge and Bennaars, 1986). To critically think is to judge, if or if not some claim or premise is convincing and believable. Critical analysis frees us from accepting dogmatic premises or assertions. It utilizes claims which are backed up by intelligible arguments and reasons. An argument is a rational attempt to prove a point by offering evidence or reasons and drawing a conclusion. The method helps to liberate man from narrow mindedness. Critical judgment/examination of ideologies will attempt to clarify and provide an annotative perspective on which direction ought to be followed in the analysis and assessment of a belief. Critical analysis was used to bring to light issues on the goals of education particularly those goals that pertain to the pedagogical procedures in the Kenyan education curriculum.

Njoroge and Benners (1986) relate critical analysis to the Socratic questioning. It takes a positive examination of judging beliefs and ideologies in an attempt to clarify them and to provide direction that ought to be followed to attain intelligibility. Critical analysis assisted to provide an alternative towards the shortcoming of the CBC in integrating the IKS in learning and teaching in Kenyan

schools. It was also useful in the assessment of the status and nature of indigenous knowledge systems (IKS) in the Kenyan CBC. A critical examination of the CBC and partly 8-4-4 education systems enabled us to clarify shortcomings of the latter and to propose strengths to the former in addressing IKS in the implementation of the CBC. Such an approach enabled this study to prescribe the means for incorporating IKS in the school curriculum.

3.2 The Analytic Method

According to Fouche & Schurink (2014), the word analysis comes from the Greek word meaning “breaking up” procedures with an aim to reveal the nature of something in question into its constituent parts. Generally, the first stage of philosophy is analytical.

In this study, the analysis was used to clarify issues relating to IKS mental tools or logic to break up the general concept under an inquiry into smaller ideas that are easier to work with. In practice this amounts to searching for a specific definition of the ideas or concepts involved in the concept under investigation, that is, IKS. The method was employed to examine the place of IKS in education and clarify how the concept was applied in the Kenyan CBC framework for teaching and learning in schools. A working paradigm was suggested to fully integrate IKS into the CBC curriculum during teaching/learning as a major contribution of this study to ground the place of IKS within the CBC.

3.3 Proposed Paradigm for Integrating IKS in Teaching and Learning

Educational approaches/methods that encourage learners to share and bring in learned experiences from their locality (IKS) into the learning situation is encouraged (Shava, 2016) in education systems. This study has proposed a working paradigm that is aligned with the constructivist model of learning. The constructivist model of learning and teaching is based on the premise that

cognition (learning) is the result of "mental construction". Learners do learn by fitting information which is new together with that which is already known from their baseline experience. It is a learner-centered approach where the interest of the learner is the main focus attached to learning and which provides direction to the teaching/learning experiences. It is noteworthy that baseline experience is akin to the IKS which is the orderly way of organizing the experiential environment into learner-centered considerations to be incorporated into the teaching/learning process.

CHAPTER FOUR

4.0 INDIGENOUS KNOWLEDGE SYSTEMS AND CONSTRUCTIVISM

4.1 Introduction

The study sought to do a philosophical assessment and analysis of the status of IKS in Kenyan schools under the CBC curricula. Critical analysis and critical pedagogy informed the assessment. The study also sought to assess how attempts of integrated approaches to IKS have performed in Kenyan schools during learning and teaching as a way of developing holistic education in learners. A working paradigm was suggested to help in the infusion of IKS during teaching and learning at Kenyan schools. It is in this regard that the constructivist method and other philosophical thoughts were suggested.

4.2 Constructivism in Education

The constructivism mode of learning was chosen to be the most appropriate paradigm for integrating IKS in the Kenyan education curriculum. Constructivism is a model for learning and teaching where learners learn by fixing ideas that are new with that which is known already. What is already known should emanate from the environment immediately to them with the help of IKS. Constructivists believe that learning is affected by learners' attitudes and beliefs.

The student in the Constructivist model is viewed as one who acts on events and objects within her or his environment and gains some understanding of the held features by the events and objects. It is referred to as learner-centered learning where the interest of the learner is the main focus attached to learning. For learning to be learner-centered, learners' environment should be taken into considerations and this can be achieved when IKS is incorporated into the teaching/learning process. Teachers act as coaches or facilitators who help learners construct their solutions and

conceptualizations to problems. When teachers in Kenya would have accepted to become facilitators and integrate IKS in their teaching/learning then, the approach towards learning in our schools will be constructivist.

The school of constructivism views knowledge as a constructed entity made through a learning process by every learner. A teacher in a constructivist school is also a learner. A class of 31 students and a teacher has 32 constructors of knowledge with 32 different knowledge ideas (Ongesa, 2020). Knowledge thus has to be (re)constructed by every person instead of transmitting it directly from one person to the other. Kenyan schools through the IKS can build knowledge in learners (Msila, 2016). Learners should not be seen to be without knowledge 'having a blank slate' (Locke, 2016) but must be seen to have accumulated indigenous knowledge which they gathered from home through informal and non-form interactions. Mental/memory construction is the method by which students generate concepts, evolving information, and accumulate experiences with each new situation. Constructivists view memory not for intact knowledge but as the repository, and for threads of information which is flexible, that can be realized in an unending variety of ways.

As far as instruction is concerned, the instructor (who is a teacher in the Kenyan case) should try and encourage learners to disclose new principles on their own using their already accumulated knowledge, in our case, IKS which is directly derived from the learners' tradition, culture and community practices. The learner and the instructor (teacher), according to constructivism (Dewey, 1966), need to engage in a dialogue that is active. Therefore, the curriculum needs to be arranged in a manner that is spiral so that the learner at all times builds upon what they have learned already.

According to constructivism, learning occurs when the learner creates meaning from experience. The mind creates its singular version of reality by filtering input from the external world. A search for meaning is what learning entails. Learning, therefore, should start with those issues around which students are actively trying to create meaning. The learning process, therefore, focuses on facts not isolated, which are primary concepts, and the interaction between the environment and the learner.

Below is the comparison between the ordinary classroom and constructivist classrooms ((Brooks & Brooks, 1993))

Ordinary Classroom	Constructivist Classroom
The curriculum is delivered part to whole, emphasizing lower-order skills	The curriculum is delivered whole to part emphasizing higher-order skills
A fixed curriculum is strictly adhered to and is greatly valued.	Learner pursuit of questions is greatly valued.
Activities of the Curricular heavily rely on workbooks and textbooks.	Activities of the Curricular heavily rely on manipulative materials and primary data sources
Learners are seen as "blank slates" where the teacher etch information.	Learners are seen as great thinkers with theories emerging concerning the world.
Generally, the teacher behaves in a manner that is didactic, depositing information to learners.	Generally, the teacher behaves in a manner that is interactive mediating learners' environment.

To validate learner learning teacher seeks the correct answer.	Learners' points of view are sought by the teacher to know learners' understanding present for use in the lessons which are ongoing.
Assessment of learner learning is seen as independent from teaching and happens entirely by testing.	Assessment of learner learning is done together with teaching and happens by teacher observations of learners at work and through learner portfolios and exhibitions.
Primarily learners work independently.	Primarily learners work as a community.

Constructivism mode of teaching in summary; emphasizes not teaching but learning, accepts and encourages learner initiative and autonomy, sees students as beings of purpose and will, takes learning as a process (Brooks & Brooks, 1993).

Constructivism nurtures children's natural curiosity and encourages child inquiry. It also puts emphasis on understanding and performance during learning assessment.

As a learning method of teaching, constructivism emphasizes the context under which learning occurs, considers the attitudes and beliefs of the learner, and gives students the time to create new understanding and knowledge from experience which is authentic.

4.2.1 Principles of IKS and its Relation to Constructivist Learning

IKS is integral to a cultural complex and it encompasses resource use practices, rituals, social interactions, spirituality, the system of classification, language, etc (Jacob, 2015). These unique ways of knowing are important facets of the world's cultural diversity for learners, and this gives a foundation for locally sustainable appropriate development. Constructivist learning which is

learner-centered borrow raw materials from learners' immediate locality/surrounding to create meaning to knowledge. Raw materials that form constructivist education include rituals, language, social interactions, and various cultural practices of that society. The following are some of the principles of IKS and their relationship with the constructivist learning that make IKS important as an area of study in our formal curricula (Mawere, 2014, Jacob, 2015, Msila, 2016).

- a) **Principle of Adaptability:** IKS is based on historical experiences that adapt to environmental, social, spiritual, economic, and political changes. The survival of any community is dependent on its adaptability to its cultural norms which are contained in IKS (environmental, spiritual, social, economic, and politics of that community). CBC using a constructivist learning approach should, therefore, integrate these cultural norms of different communities into the school curriculum for learners to learn more about their culture at the same time sharing accumulated knowledge of their immediate cultural communities. Constructivism is a learner-centered teaching/learning approach and it gives learners' accumulated experience from their cultures a great preference in classroom activities. If learners' historical experience is taken into account by the CBC learners' spiritual, social, environmental, economic, and political knowledge will be strengthened. IKS is rooted in a social context. All-natural world parts are infused with spirit. Mind, spirit, and matter are thought to be inseparable. The social context upon which IKS is rooted is socially constructed and requires a learner-centered (constructivism) learning model to be in place for its effectiveness.
- b) **Principle of collaboration or community learning in education:** IKS encourage community learning where knowledge is shared among learners and with their teachers who are facilitators. In Kenya learning in most cases is teacher-centered (KICD, 2017). To move away from this traditional belief that knowledge is owned by an individual who is a

teacher, the CBC should employ a learner-centered model in Kenyan classrooms so that accumulated knowledge by those learners is shared and analyzed by all learners who form a community of inquirers (Ongesa, 2020). Shared community knowledge is responsible and dynamic. IKS, therefore, is dynamic since it is not rooted in a particular place or position in history but has grown, developed, and adapted over millennia. This means that IKS is not static. This knowledge system cannot be reduced to a given locality or a given period or language, but, but it cuts across cultures, generations, and different practices. CBC should develop a curriculum that accommodates all cultural practices and cuts across generations. The constructivist learning model which takes into account learners' community knowledge is the best model to integrate IKS into teaching/learning in Kenyan schools.

The responsibility of the well-being of the environment around us belongs to all persons (Indigenous and modern man) (Msila, 2016). Education and in this study the CBC, cannot overlook the knowledge that surrounds our communities. Recognition, trust, increased understanding, and respect between representatives, traditional knowledge and scientist are essential in the integration of IKS. An educational learning model that takes into account community knowledge is called for.

- c) **Principle of Holistic and Intergenerational Knowledge in Education:** IKS encompasses all aspects of cultural practices, language, history, life-spirituality, social interactions, etc. (Mawere, 2014). CBC had only identified language aspects to be studied in our school for learners at lower primary. For learners' education to be holistic the CBC should employ the constructivism learning model as well as IKS developed by various cultures to provide and promote a compressive education that encompasses all aspects of life in learners. Besides, IKS collective memory is passed from one generation to the next orally, within a

community through songs, legends, ceremonies, language, and proverbs. These also need to be part of the curriculum for all learners.

- d) **Principle of Validity and Irreplaceability in Education:** IKS cannot be replaced by western science, it is what makes that community. IKS must be adapted and natured because without IKS those individuals who are born of it cannot claim full authority without it (Msila, 2016). The CBC curriculum, therefore, has no option, but, to ensure that the curriculum has all aspects of IKS, not just part of it as seen in the current curricula where only the ILA is taught (KICD, 2017). IKS does not need qualification or validation of western education, it is up to the modern knowledge and science to catch up with IKS because it is part of nature and is always valid as far as nature is valid. Before western education, IKS already existed and thrived in those communities. Priority to IKS should be accorded to learners before introducing new western knowledge and this can best be achieved when the constructivism learning model has been put into place.

4.3 Role of IKS in Education

a) Make Educational Systems for Africans Non-racial

Mazrui (1978) reported that a few Africans who are educated are also aware that they are in what can be termed as cultural bondage. He argues that all Africans who are educated are captives of the West in terms of culture. Therefore without IKS in our curriculum, we are in both education and cultural bondage. Nyerere (1968) and Ngugi wa Thiong'o (1986) opine along similar lines. Nyerere, Wa Thiong'o and Mazrui noted that a curriculum which is racialized (a curriculum which draws its content or material from a certain region(s) leaving content or materials from other regions (s) is a new form of imperialism, an instrument of neocolonial control to the production of

knowledge in the world. CBC has given preference to the content of the west and only a small section of African (IKS) (ILA). In this view, I agree with UNESCO (2008) that

Indigenous languages are the ways of passing, applying, and preserving community knowledge in our schools. A multilingual or bilingual study involves all learners as a whole; it provides an opportunity for the learners to face, in a sense which is positive, their local knowledge with other forms of education/knowledge from other communities elsewhere.

The school curriculum should not only recommend IKS in language activities (KICD, 2017), it should cut across the entire curriculum and all regions or communities' indigenous activities to cover all aspects of IKS.

b) It Provides Strategies for Solving-Problems and Promotes Innovative Thinking for Local Communities

Accommodating learners' IKS into the curricula enhances and promotes innovative constructivist thinking in the learners. Students can afford to abstract knowledge from their understanding of IKS, their learned personal experiences, and what is already known from those localities where they come. For example in Jigawa State in Nigeria, one boy invented a refrigeration system that is natural and that required no gas, paraffin, or electricity to function. The system, which he called "potin-pot cooling system," is as efficient as refrigerators of modern times. It can preserve foods that are perishable and fresh for about one month. Many persons in his village are using the system. The system has helped farmers keep their foods for a relatively long time, thus, assisting people in his rural areas from living/moving to towns (Fafunwa & Aisiku, 1982). This invention by the boy from Jigawa state in Nigeria is a form of IKS innovation that is relevant and practical to societal needs. Such innovations are in our communities and need to be tapped into the current curriculum to improve learners' problem-solving skills.

c) Generate & Motivate Learners' Interest

Since IKS is education that emanates right from learners' practical experiences, its integration into the curriculum of the school can bolster and motivate the intellectual interests and fortunes of the students as learners realize that they recognize that which they already know, say, and do in their own /immediate communities. This agrees with the statement that we learn from what we know to what we don't know. This means that IKS will, no doubt, stimulate and inspire learner intellect to seek solutions and even abstract to their daily challenges by applying solutions that are generated locally.

In the Western part of Mozambique and Luo Nyanza in Kenya for instance, brewing beer using a traditional method that is similar to the fractional distilling system learners' learn in chemistry at secondary, has also been invented (Mawere 2014). Noting that their fruit trees (citrus, and banana) production is more than they consumed, the people of Mandau in the Western part of Mozambique have developed an indigenous beer-distillation system out of which they utilize ripened fruits: The fruits are placed into a large pot made of clay, then boiled, liquid contents are turned into vapor before condensing the vapor to obtain a colorless pleasant liquid. This pleasant tasting liquid is a locally produced beer with an ethanol/alcoholic content possibly being of a higher percentage than that which is produced commercially using fractional distillers. Therefore, in cases where learners go into learning the chemistry of distilling, they already know the traditional beer-distilling system, understanding the concept is then easy, spurs interest and motivation in the development of scientific knowledge.

d) Teach Language, Instil Self-Consciousness and Cultural Identity

IKS could also be used in recounting history, reclaiming dignity and humanity, teaching language, and promoting a sense of cultural identity and self-consciousness in students. This is critical, as

persons are people due to their culture. Ethnic groups are differentiated from others out of their unique cultures. Education, therefore, will add to society if what is experienced and known on the day to day activities is integrated into the curriculum of the school. Learning institutions can identify, nurture, transmit, and preserve the cultural identities by maintaining the IKS of their respective communities.

Under the broadened inclusive teaching and curricula materials advanced in 2005 by UNESCO, the traditional society is advised to contribute actively to an education that serves both the physical and cultural surroundings of the learning institutions. Education which is inclusive is responsive, relevant, and accounts for local and practices of host communities.

As noted in UNESCO (2008: 17): “The needs of national and global participation by particular distinct communities can best be addressed by multilingual education”. By using IKS, students appreciate easily their cultural identity, language, and technological advancement and wisdom of their age. Therefore, a re-examination of IKS is one of the processes of preserving authentic culture with deep roots in African traditions (Woolman 2001). For instance, forms of IKS such as learners’ indigenous games help children be morally sensitive, innovative, creative, and accept the works of forefathers’ creative indigenous epistemologies and genius in games, physical activities, and language.

e) Promotion of IKS in Different Cultures

The integration of IKS in the education curricula would help communities to share their educational theories and practices with one another. Individuals from diverse backgrounds would interact and share IKS from their communities in ways that will make them copy and accept others where necessary without an accusation of non-compliance. There is increasing agreement that

exchanging knowledge must be a street of two-way. Building on IKS, any country's basic education system component, is the foundation to mobilizing such capital, for instance. Sharing IKS could not only reduce poverty but also help enhance the development of cultural dimensions (Mawere 2014). For example, instead of using money on "modern" circumcision in hospitals, a traditional one could be the option, like those performed during initiation rites of *khomba*. Another example relates to farming practices: The people of Washambaa of Tanzania in the Mountains of Usambara, are a good example who invented a system of using the land of deciduous by infusing annuals, perennials on the same plot and multi-cropping rotation. The same ideas have been taken to Rwanda in Nyabisindu, multipurpose special bunds of contour farming with shrubs, grasses, and trees were included in the system and were again copied by Washambaa when the demand for firewood and the high population had used up the soil cover (Mawere 2014; The World Bank 1998).

f) Promotion of Reciprocal Obligations and Interpersonal Relationships

The IKS content which includes all rituals, skills, and activities is needed to sustain the life and culture of the community and family (Woolman, 2001). This means that IKS places great importance on reciprocal obligations, interpersonal relationships, and preservation of the community and the role of knowledge as a force that advances relationships is critical. It is therefore apparent that IKS that emphasizes human values, interpersonal relationships, and integrity is needed urgently in the Kenyan education system as the implementation of CBC takes root.

4.4. Analysis of IKS in the Kenyan Education Curriculum (CBC)

Kenya's formal education system is western-oriented having inherited the British system at independence. Despite various attempted reforms of the education system, it has continuously built a critical mass of elites not only a sense of denial of their heritage (IKS) but also impacted the sense of loss of self-confidence among individuals in appreciating and expressing their native cultures and values. Going forward in the 21st Century, reclamation of identities rooted within a culture through the authentication of IKS has to be seen as a way towards decolonizing the dominant curricula of Kenyan schools towards making learning more practical and relevant in addressing the needs of Kenyan communities (KICD 2016; The Republic of Kenya, 2012).

Infusing IKS in teaching /learning has been seen as important in de-emphasizing the existing curriculum that is perceived to be more examination-oriented, too abstract, and hence not relevant. Reconstruction of the curriculum in Kenya through the implementation of CBC should become part of the process aimed at the restoration of IKS with roots in authentic African traditions. IKS provides an opportunity to develop an approach that is inclusive to education and ought to be recognized and given value at the curriculum formulation level and its principles are infused into the teaching/learning process (Msila, 2016; Semali & Kincheloe, 1999). A constructivist teaching model is therefore called for. In a constructivist classroom, learning is constructed (Jacob, 2015). Students are not blank slates (Locke, 2016) upon which knowledge is etched. Learners come to learning situations with already formulated knowledge, ideas, and understandings gathered from their localities through perception and experience (Jacob, 2015). The previous knowledge and this case IKS is the raw material for the new knowledge they will create. Learners should be given

room to reflect and to construct their method of solving the problem at hand using accumulated knowledge experience.

By CBC identifying the indigenous language activities as part of IKS (KICD, 2017) this study argues that the breadth and depth of IKS ought to be expanded to encompass not only language activities but also science, agriculture, home economics, and engineering among others. This means that ILA which is to be taught by the CBC curriculum is a sub-set of IKS. The study, therefore, advocates for a total focus of the curriculum on all aspects of IKS not just a section of it like language as seen in the CBC. According to KICD 2017 and KICD 2018, learners in lower primary (grade 1 to 3) are to be taught indigenous language activities (ILA) which encompass the culture of the immediate community and her practices. There is also a challenge in metropolitan and cosmopolitan areas such as in big towns (Nairobi, Nakuru, Kitale, Narok, Mombasa, Kisumu, and other towns) with different communities living together having different IKS (Jacob, 2015). Exclusion and marginalization of IKS as ILA coupled with cosmopolitan/metropolitan regions has taken place in the Westernized school context, supported by African tutors who are taught on Western curricula since our education system and institutions are remnants and constructs of western education systems and ideologies (Tanyanyiwa, 2019). For IKS to be taught as a whole in our schools, all stakeholders who include the ministry of education, curriculum developers, curriculum implementers, colleges, and learners should be agents of transformation towards IKS (Tanyanyiwa, 2019). Even though the CBC has only managed to introduce ILA at lower primary and that our colleges rarely train tutor on how to infuse IKS into teaching/learning (Jacob, 2015) a shift towards a clear focus on IKS by all stakeholders and the CBC is called for.

4.5 Proposed Paradigm for Integrating IKS in Teaching and Learning in Kenyan Schools.

In the constructivist understanding, the aim of learning is for a learner to create her or his understanding, not to just cram answers that are "right" and regurgitate the meaning of others. Since education is interdisciplinary, the best way to evaluate learning is making the assessment process to be part of learning, making sure it provides learners with knowledge of learning quality. Standardized testing and elimination of grades which tends not to be very common with the Kenyan education system/curriculum is called for.

Friedemann & Wilhelm (1998) proposes the following rules for meaningful learning:

1. Search for meaning entails learning. Learning, therefore, should start with matters in which learners are actively involved.
2. Meaning needs knowledge not only as parts but as well as wholes. The learning process, therefore, focuses on concepts that are primary, but not as isolated facts.
3. The need for learning is for a learner not to just master the correct solutions and regurgitate the meaning of others, but, to create her or his meaning. To examine learning is making the test part of the learning, to ensure it provides learners with knowledge on the quality of learning.

Customized curricula: Elimination of a standardized curriculum is called for by the constructivism model. Such curricula use learners' prior knowledge. Instruction: under constructivism, educators are expected to focus on making connections between fostering new understanding and facts in students. Instructors tailor their strategies of teaching to learner responses and encourage learners to interpret, analyze, and predict ideas. Teachers also heavily rely on questions that are open-ended to promote dialogue which is extensive among learners. Assessment: constructivism calls for the

abolition of standardized testing and grading. Instead, assessment becomes part of the process in learning so that the learner plays a bigger role in judging progress on their own (Noddings, 2008).

Constructivist learning/teaching is grounded on research about the brain of human beings, what should be known, and how learning ought to occur. We summarize the findings of Caine and Caine (1991) on the principles of teaching compatible with the brain processes that the study finds useful when integrating IKS in the CBC for the Kenyan case:

1. Brain as a parallel processor of information, simultaneously processes different types of information that include cultural knowledge, thoughts, and emotions. Teaching that is effective employs different learning strategies. IKS is part of cultural knowledge and can easily be processed in the brain of learners if they are given a chance. This can be possible if the learning strategy is constructivist or learner-centered.

2. Learning involves perceptions and accumulated experience from both the learner and the teacher. Learning this is subjective and there is no single truth or reality about knowledge. Knowledge must not just be given or deposited on the learners' mind, learners should be given room to construct their knowledge and for our case, IKS serves as an ingredient for knowledge construction.

3. Effective teaching recognizes that meaning is unique and personal and that learners' knowledge is grounded on unique experiences of their own which must be nurtured and be developed by teachers.

4. Simultaneously the brain processes wholes and parts: People find it difficult learning when either wholes or parts are overlooked. Learning cannot be holistic (whole) if part of knowledge and in our case IKS is left out or overlooked during the teaching/learning process.

5. Learning involves both peripheral perceptions and focused attention: Learning is influenced by the climate, culture, and environment. Climate, culture, and environment constitute learner's IKS. CBC, therefore, should consider integrating into the curriculum learner's IKS to make that learner-focused

6. At least we have two distinct types of memory: rote learning systems set, and a spatial system of memory. Learning and teaching that emphasizes heavily rote learning (teacher-centered learning) do not promote the experience. Spatial learning and understanding can be inhibited if learning is teacher-centered. We remember and understand better when skills and facts are embedded in spatial, natural memory. Experiential learning that is learner-centered and constructivist in nature is the most effective.

7. Learning is inhibited by threat and enhanced by the challenge: The climate of a classroom need to be challenging and not threatening to learners. For learning to be challenging, learners should not be given facts, but, challenging questions and problems to find solutions. A challenging classroom is a learner-centered classroom and this is what is called for in the CBC with learners IKS being an ingredient.

8. Since every brain is different from another, multifaceted teaching is recommended to allow learners to show preferences. Teacher-centered methods of teaching are not good in this case, otherwise, learner-centered methods (constructivism methods) are recommended.

9. This study, therefore, recommends a constructivist learning strategy or learner-centered learning strategy to be in place for the effective integration of IKS by the CBC during the teaching/learning process.

4.5.1 Constructivism as a Paradigm for Integrating IKS

To understand the place of IKS and integrate IKS for school learners in the Kenyan CBC, a constructivist worldview was used. Constructivism within the IKS approaches focus on people's specific contexts (Creswell, 2009). Reality is personal and is constructed socially by the individual who is actively involved (Ongesa, 2020; Fouche & Schurink, 2014). It is assumed that individuals would seek to understand their worldview, and the goal of search relies on the worldviews relating to that which is studied. This study aimed to enable knowledge/curriculum constructors to create a curriculum in which the participants negotiate and construct meaning together historically and socially (Creswell, 2009) as they work in collaboration with curricula specialists, as opposed to the current practices that have been maintained as largely top-down affairs. It through such a practice that only a very small aspect of IKS (ILA) was partially integrated and without the due constructivism procedures. Perceptions on IKS from the learner and the teacher are subjective and there is no single truth or reality about knowledge. This means that reality or truth is not static but changing according to the perceptions of those involved.

What Does Constructivism have to do With the IKS Classroom?

Constructivist teachers pose questions and problems, then guide learners to find their answers. In a constructivist classroom, learning is constructed (Jacob, 2015). Students come to learning situations with already formulated knowledge, ideas, and understandings gathered from their localities through perception and experience (Jacob, 2015). The previous knowledge and this case

IKS is the raw material for the new knowledge they will create. Learners should be given room to reflect and to construct their method of solving the problem at hand using accumulated knowledge experience. Learning activities require the learners' full participation (for example hands-on-experiment in secondary sciences and technical subjects). This model requires learners to talk about, and reflect on their activities. This framework relies heavily on collaboration among learners. The main activity in a constructivist classroom is solving problems. Learners use inquiry-based learning methods to ask questions, investigate a topic, and use a variety of resources to find answers and solutions. Learners explore the content, they make assumptions, conclude, and exploration continues through more questions until a reliable conclusion is found. To integrate IKS into teaching/learning in a classroom, the constructivist model is the most applicable as it seeks to solicit learners' ideas before giving them new ideas. Prior knowledge is the accumulated IKS and it is important in forming knowledge.

4.5 Conclusion

IKS can immensely contribute to the teaching/learning of African people as much as a modicum and value of respect are given to them. The relation of intangible heritage and its IKS to the learning of the child in Africa should not be underrated. Full recognition of IKS can only be realized if it is implemented fully in the academic curriculum and its purpose is made popular. This critique of postcolonial and colonial education and the quest for identity has called for some African scholars to re-look into the outcomes, objectives, and methods of IKS in education. Studies of such kind will offer insights that are valuable in the ongoing improvement of the Kenyan education system through the CBC.

CHAPTER FIVE

5.0 FINDINGS OF THE STUDY

5.1 Introduction

This chapter sought to find out whether African IKS is important in the well-being of an individual and the societal development of a nation like Kenya. It also sought to find out the place of African IKS in the Kenyan education curricula. The study sought to establish the extent to which the proposed paradigm for infusing IKS into the Kenya Competency-Based Education curriculum would be helpful to educators, curriculum developers, and learners.

5.2 Findings on the Role of IKS in the Education Curriculum.

Based on the various studies done, Indigenous Knowledge System (IKS) is important in the well-being of an individual and societal development of any nation. In Educational Systems IKS was found to perform the following roles:

- a) A curriculum that is racialized can be a renewed form of imperialism, a tool of neo-colonial manipulation to alter the production of knowledge in the universe (UNESCO, 2003). Therefore, without IKS in our curriculum, we are in both education and cultural bondage.
- b) Infusion of learners' prior gained knowledge into curricula of education enhances and promotes innovative constructivism and thinking in those students. Students would afford the chance to gain understanding from their knowledge of the indigenous conditions, their personal experiences, and that which is known already from those localities where they come from. IKS is similar to needs that are practical and can be infused into activities and be recalled when those activities are again needed.
- c) IKS is a component of global education that is important on various issues. By having conventional science and IKS in the education curriculum, students are, in this case, best

informed to decide on their own accord, create individual destiny, and break the bondage of imperial domination based on what they learn both at school and home.

- d) IKS, being education or knowledge that children have before enrolling in the academy, stimulate and inspire their intellect to seek solutions and even abstract to their day to day challenges and applying solutions that are generated locally.
- e) The teaching of IKS such as learners' indigenous games, for instance, helps children not only to be sensitive morally, innovative, and creative, but also accepts the works of forefathers,' creative indigenous epistemologies and genius in the world of physical education, games, and language. Most schools across Kenya, features, only games of non-African such as tennis, chess, netball, etc. There's a need, therefore, to reverse this situation in Africa by integrating IKS into the modern curriculum.
- f) The integration of IKS in our school education system shall no doubt help various societies/cultures to exchange their gained knowledge within their localities. Persons from distinct cultures would be made to interact and share IKS from the cultures of others in a way that will enable them to emulate and appreciate other communities.
- g) Building on IKS is the foundation for mobilizing human capital; sharing IKS could not only reduce poverty but also help to enhance the development of a cultural dimension to creation, preservation, and application of knowledge.
- h) All of the rituals, skills, and activities required to sustain life in and culture of a community and family can be integrated into intellectual training, character-building, physical education, and manual activities. This means that IKS places great importance on reciprocal obligations and interpersonal relationships. Therefore, IKS that emphasize human values and interpersonal relationships is urgently needed now in contemporary education more than ever before.

5.3. Findings on the Analysis of IKS in the Kenyan Education Curriculum (CBC)

A philosophical critique was performed to establish the existence of IKS in the CBC, and the findings were presented as shown below.

- i. Education cannot exclude cultural knowledge, since the content of education has value underpinning it and is associated with a particular culture.
- ii. CBC's identification of indigenous language activities (ILA) as IKS is disputed by this study (KICD, 2017) as a narrow conception. IKS encompasses not only language activities but also aspects of science, agriculture, home economics, engineering, and different sporting activities among others. The total infusion of IKS into the curriculum is what this study recommends. Therefore, ILA which is to be taught in the CBC is considered as just a sub-set of IKS.
- iii. Educational curriculum reform in the African context should be guided by the questions: what and where is the place of our IKS in the African education systems and processes?
- iv. To decolonize the Kenyan education system, space must be created for recovering and applying communities' cherished knowledge and practices informally. Non-formal and informal education processes and for developing curriculums that are responsive to the local contexts (Shava, 2016).

5.4 Findings on the Proposed Paradigm for Integrating IKS in Teaching/Learning at the Kenyan Schools.

The study proposed constructivism as a suitable model for the infusion of African IKS into the Kenyan curriculum or CBC. Constructivist student acts on events and objects within her or his environment and gains an understanding of them in context.

For learning to be learner-centered, the learners' environment should be taken into consideration by a consideration to integrate IKS in the teaching/learning process. When teachers accept to become facilitators, the approach towards learning in schools will become constructive in nature. The teachers' role would be to act as coaches or facilitators who help learners construct their own solutions and conceptualizations to problems.

Constructivism is good for the acquisition of advanced knowledge, and IKS is its ingredient.

Therefore constructivism call:

- i) For the elimination of standardized curriculum. Instead, customized curricula are promoted using the learners' prior knowledge (in our case IKS). Emphasis is put on hands-on problem-solving.
- ii) For instructors to tailor their strategies of teaching to learner responses and encourage learners to interpret, analyze, and predict ideas. Teachers also rely heavily on questions that are open-ended and which promote extensive dialogue among learners.
- iii) For the abolition of standard grading and testing; assessment instead, becomes part of the process of learning so that learners play a big role in judging progress on their own.
- iv) For a research-grounded learning/teaching instead of question-answer technique or examination-oriented teaching.

The CBC curriculum, therefore, should adopt constructivism and IKS to make education in our schools learner-centered. It is in this regard that constructivism nurtures children's natural curiosity, encourages child inquiry, takes the learner's mental model into account, and acknowledges the critical role of experiential learning.

5.5 Conclusion

African scholars are called to re-look into the outcomes, objectives, and methods of IKS in education. Studies of such kind will offer insights that are invaluable in the ongoing education reforms in Kenya towards embracing the CBC. IKS, as long as it fails to find full realization within and integration which is real into the curricula and the mainstream discourse in knowledge, the lofty pan-Africanism of self-sustaining development, economic growth, and collective self-reliance will remain unrealized dreams.

CHAPTER SIX

6.0 RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

This chapter sought to provide a summary of the study findings, suggestions for further research, and a position on the role of, analysis of, and a paradigm for possible integration of IKS in the Kenyan curriculum.

6.2 Summary of the Study

Based on the various studies, participation in Indigenous Knowledge System (IKS) is important for the well-being of an individual and societal development of a nation. In Education Systems, IKS has been found to have the following benefits: de-racializes African Educational Systems and frees Africans from the bondages of both education and culture; provides a basis for Problem-Solving Strategies and innovative thinking for local communities; students are better empowered to make their own decisions and chart their destiny; enable learners to shake off chains of imperial domination based on what they learn both at school and home; helps to generate and motivate learners' interest during the learning process. Furthermore, IKS teachings that involve indigenous games, for instance, help children and youth not only to be morally sensitive, innovative, and creative, but also accept the works of forbearers' creative indigenous epistemologies and genius in the world of games, physical education, and language. Building on IKS helps to enhance development in the cultural dimension and emphasizes that human values and interpersonal relationships are urgently needed in contemporary education.

Curricula and pedagogy in Kenya continue to embrace a worldview of Western culture, and do so in western languages mainly in English; a factor that appears to hinder students' learning

experiences. Accumulated IKS has not been accorded the needed value concern that would be central to the implementation and sustainability of the CBC. The exclusion and marginalization of IKS have taken place in the westernized school context, supported by African tutors who are taught on western curriculum with a distorted view that Africans possess little or no IKS of value that can be utilized in the process of educational transformation. With such a mindset, even the introduction of new systems such as CBC continues to be characterized by the dominance of the western knowledge system and unwillingness to represent and apply local knowledge within formal education and socio-economic contexts. This is despite the fact that IKS situated practices and culture of the local communities relate as valid knowledge sources that are relevant to learning and need to be incorporated in the implementation of CBC.

For learning to be learner-centered, experiences from learners' environments should be taken into considerations and this can be achieved by incorporating IKS into teaching/learning under the constructivist approach. Teachers would act as coaches or facilitators who help learners construct their own solutions and conceptualizations to problems. The constructivist would nurture children's natural curiosity, encourage the child's inquiry, take the learner's mental model into account, and acknowledge the critical role of IKS experience in the teaching/learning continuum.

6.3 Recommendations for Further Research

African scholars are called upon to re-look into the objectives, methods of IKS, and the expected outcomes for education. Such studies would offer invaluable insights into the ongoing education reforms in Kenya relating to the implementation of CBC. It's the contention of this study that as long as IKS fails to find full realization within and integrate the curricula and the mainstream discourse in knowledge in Kenya and African in general, the lofty pan-Africanism of self-

sustaining development, economic growth, and collective self-reliance will remain unrealized dreams. Additionally, it would be helpful to undertake a comparative assessment of the stakeholders' perceptions of the place of indigenous knowledge in the school curriculum. It may be equally interesting to understand teachers' perceptions relating to the integration of IKS in curricula of teacher education in Kenya. As learners who will the products of CBC progress to attain university education, it would be interesting to seek answers to the following question: "What are the implications of integrating IKS in the University curricula in relation to diverse career paths, multiculturalism, and urbanization among others?"

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