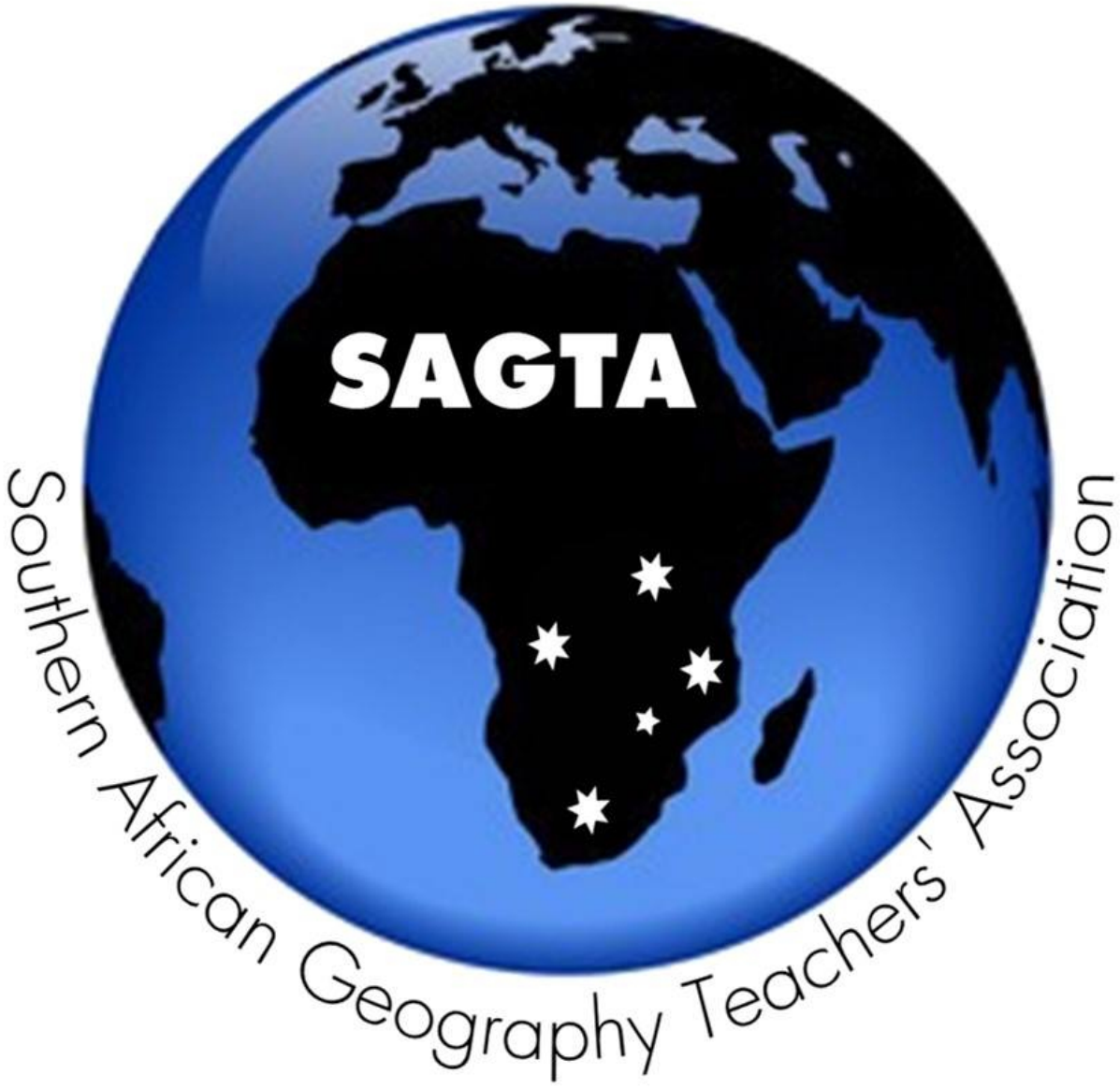
Journal of Geography Education for Southern Africa – (JoGESA)

SPECIAL ISSUE: Sub-Saharan growth in Geography Education



SPECIAL ISSUE - Volume 4, Number 2 – September/October 2019

The Journal of the Southern African Geography Teachers' Association (SAGTA) – ISSN 2517-9861

The challenges of Integrating Indigenous Knowledge in the teaching of weather and climate in Geography in Manicaland province of Zimbabwe.

Joshua Risiro
Jrisiro@gmail.com
Great Zimbabwe University, Zimbabwe

Abstract

Scholars have acknowledged that, the current education system in Zimbabwe has done very little to incorporate learners' socio-cultural experiences. The purpose of the qualitative case study, from which this research draws its data, was to examine the views of the teachers and education officers on the challenges of integrating Indigenous Knowledge (IK) into the teaching of weather and climate. The study was conducted in the secondary schools of Manicaland in Zimbabwe. It is hoped that these views from the various stakeholders can contribute to the ongoing discussions on updating the Geography curriculum (2015 – 2022) in Zimbabwe. Data was generated using interviews and focus group discussions. The study revealed numerous challenges in integrating IK into Geography in the secondary schools which include the lack of written texts given the oral tradition, the training of teachers, insufficient IK experts for guidance, teachers own attitudes and beliefs, assessment challenges and urbanisation. However, I argue that these challenges should not detract the decolonizing project of integrating IK into the Zimbabwean Geography curriculum, rather the challenges should open up avenues for further discussion on including IK in the curriculum. It is recommended that the Ministry of Education seek to address the challenges, reported on the integration of IK into the Geography curriculum, that lie within the ambit of teaching, learning and assessment.

Keywords: Indigenous knowledge, teachers, Zimbabwe, Geography curriculum integration, challenges, weather and climate.

Introduction

This research reports on the anticipated challenges that teachers and Geography ministry officials from Manicaland province, Zimbabwe foresee in integrating Indigenous Knowledge (IK) into the newly constructed Geography curriculum (2015 – 2022) in the section on weather and climate. Whilst there are several challenges that are highlighted by these stakeholders, I argue that these

challenges should not detract from the pursuit of the decolonizing project of integrating indigenous knowledge into the Zimbabwean Geography curriculum. Rather the challenges should open up avenues for further discussion and tangible efforts for the Ministry of Education to commit to including indigenous knowledge in the curriculum.

Various perspectives on Indigenous and Western education

The British Education system which was adopted in Zimbabwe just like in many colonized nations, regarded IK as primitive and inappropriate to colonial economic interests (Nherera, 2000; Shizha, 2006; Sibindi, 2017). In contrast, Eurocentric knowledge was regarded as superior to other forms of knowledge (Nherera, 2000; Shizha, 2006; Sibindi, 2017). Most curricula in former British colonies are a replica of the colonial curricula in which IK has been largely ignored (Dreyer, 2018; Mavhunga, 2006; Shizha, 2010; Sibindi, 2017). However, some scholars (Dei 2000; Kawagley, 1998; Mapara, 2009) argue that science is contested knowledge hence there are many ways of knowing. Dei (2000) views integration of IK as a way of overcoming the colonization of knowledge and culture in different geographical areas. He therefore advocated for a hybridisation of knowledge. Hybridisation is a concept in which people who are living in two life worlds gain knowledge from either side, that is a mix of IK and western knowledge in a curriculum (Carter, 2006).

Studies have shown a mismatch between main stream education and that of indigenous people. The mainstream education has tended to ignore and trivialize the knowledge that indigenous people bring into the classroom (Dreyer, 2018). Furthermore, Sigauke, (2016) acknowledged that, the current education system in Zimbabwe has done very little to incorporate students' socio-cultural experiences. This has negatively affected the academic success of indigenous students (Barnhardt and Kawagley, 2005; Cushner, McClelland and Safford, 2012; Gay, 2010; Skutnabb-Kangas and Dunbar, 2010). The government of Zimbabwe has introduced a new Geography curriculum in trying to redress the issue of IK which has for long received little attention and regarded as irrelevant. It is against this background that the research sought to explore the views of teachers and education officials on the anticipated challenges of integrating IK into the teaching of weather and climate in the secondary schools.

The meaning of indigenous knowledge

Ogunniyi, (2011) regarded indigenous as something that existed within indigenous communities before colonization. The South African department of Education (2003) regarded indigenous as something that has originated in Africa. Hewson and Ogunniyi (2011:680) viewed indigenous as "something that existed before colonialism". Govender, Madaly and James (2013) observed that, indigenous knowledge was passed on from one generation to the other and owned by the local communities. The study adopted Khupe (2014: 43) definition that viewed indigenous as "something originally in the area or produced within the area". In this paper, indigenous refers to the descendants of people who were in Zimbabwe before the colonization of Zimbabwe in the 1890's and thus the knowledge they have procured from their forefathers is regarded as indigenous knowledge.

There is contestation on what constitutes knowledge. It varies with one's philosophy and focus. The definition can also change due to socio-political dynamics. Aikenhead (1996) views knowledge as a way of knowing. Hewson, (2015) views it as a way of seeing and Tefflo (2013) suggests that it is a people's way of life while Ogunniyi and Ogawa (2008) regard it as ways of living and behaving properly. In this study knowledge is taken as a way of living and belief systems of a community.

The value of introducing IK in the section of weather and climate in Geography

Zimbabwe like any other country is being affected by the effects of climate change. The economy of Zimbabwe is agro-based yet modern weather forecasting is becoming less reliable due to the unpredictable weather changes caused by global warming. The Zimbabwean situation is worsened by the poor state or the absence of weather stations to predict weather with more accuracy in some parts of the country. Aguado and Burt (2010) argue that, weather forecasting is becoming less reliable due to a lack of accurate information on atmospheric composition. The main meteorological station is in Belvedere, Harare that is facing challenges in projecting accurate temperatures for the whole season due to outdated technology (Zinyemba, 2015). Seeking alternate forms of knowing is now imminent.

Fanon (1963) asserts that, for the decolonization programme to be successful, change needs to take place. This change comes through integrating IK in the teaching of Geography. Dreyer (2018: 364), therefore urged teachers to "create a rich learning environment that aligns with the learners' context and cultural background." Decolonization of the Geography curriculum as noted by Khupe (2014) is a step towards recognizing the importance of IK as a way of knowing. Baskin (2006) added his voice by noting that, decolonization of the curriculum allows indigenous communities to control their information, cultural knowledge, histories and cultural artifacts. Mosweunyane (2013) concurs that, indigenous world views promote the use of indigenous pedagogies in the classroom such as the use of traditional songs and stories.

Indigenous knowledge plays a significant role to the learners and the community. Breidlid (2009) observes that, indigenous epistemology allows the teachers and the students to identify themselves with the learning process and learners' experiences. According to Mawere (2015), when learners associate what is leant from school with their experiences in the community, learning becomes more interesting. Furthermore, Mawere (2015: 61) urges for IK integration in the school curriculum as the application of prior knowledge by the learner promotes, "innovative thinking and constructivism." The use of local examples enables the learners to relate themselves with the learning process in the classroom. In Kenya students were found to be performing better when they use their own language and related information to their cultural experiences (Dennis, 2010). The integration of IK has thus been found as a way of sustaining IK and heritage (Aikenhead and Michell, 2011; Nakata, 2003).

Scholars such as Shizha (2006) view the integration of indigenous knowledge into the curricula as a way of empowering teachers, learners and community to the education system. Social constructivists believe learners can construct knowledge as they interact with their environment (Mcleod, 2014). Furthermore, Nakata (2003,) justifies the integration of indigenous knowledge into the school curriculum by arguing that, it contributes to the generation of new knowledge and the creation of a curriculum that is inclusive and capable of achieving sustainable development. Dei (2000: 120) concurs by pointing out that the integration of IK into the curriculum was "a way of acknowledging that different forms of knowledge are complementary and co – exist".

The report by Nziramasanga Commission of Inquiry into Education and Training in Zimbabwe values the incorporation of IK in the classroom as this inculcates ubuntu values among the leaners. (Government of Zimbabwe, 1999). *Ubuntu* values promotes community cooperation (Mungwini, 2013) and individuals who are productive and responsible (Mutekwe, 2015). More so, as evidenced in South Africa integrating IK in the school curricula allow the teaching of history and heritage of a country (Department of Education, 2014).

The knowledge gap

Various studies have been carried out in Zimbabwe on IK (see Magwa, 2008; Mapara, 2009; Muguti and Maposa, 2012; Shava, 2005; Shizha, 2006; Shoko, 2012; Tatira, 2000). However, these researchers, in their studies have largely showed the forms of IK that are available and their importance to the society.

The summary of the research done in Zimbabwe on IK shows that, several studies have been carried out on IK, however the researchers did not focus on the classroom teaching of IK in Geography particularly under the topic of weather and climate. Furthermore, the researchers did not explore the challenges of incorporating IK in the teaching of weather and climate. The lack of IK integration in the classroom teaching is confirmed by Dreyer, (2018); Matsika, (2012); Ogunniyi, (2016); Pedzisai, (2013); Shizha, (2008) who have all acknowledged that, there is minimum application of IK in the classroom teaching.

Theoretical Framework

The study is guided by multiculturalism theory. Multiculturalism is a system of beliefs and behaviour that recognizes and respects the diversity of values and cultural beliefs of the people in a community (Knight, 2008; Kymlick, 2012; Rosado, 1997). The theory acknowledges the existence of different forms of knowledge (Stanley and Brickhouse, 2001). This study therefore acknowledges the co-existence of different forms of knowledge (IK and Western science) brought into the classroom by learners from diverse of backgrounds and ethnicity. Multiculturalism fights against the segregation of the marginalized groups such as the indigenous people. Kymlick (2012:6) points out that, multiculturalism calls for "human equality among all nations" (Kymlick, 2012, 6). It emanated from the need to cater for diversified socio-cultural classrooms. This

diversity called for teachers to review their teaching content and methods (Dreyer, 2018; Jay, 2011). Multiculturalism developed as a result of colonized nations attaining their independence and reviewing their education curriculum (Jay, 2011). In Zimbabwe, the government is currently reviewing its curriculum among other reasons to incorporate more indigenous knowledge (Government of Zimbabwe, 2015). The study is therefore pertinent in exploring the challenges that may be faced in curriculum change with the aim of improving the implementation process of the curriculum review.

Methodology

The study positions itself within the interpretive paradigm. The interpretive paradigm can be referred to as naturalistic (Patton, 2015) or constructivist (Katrina and Jill, 2019). Interpretivist research takes place in "real-world settings and the researcher does not attempt to affect control or manipulate what is folding naturally" (Patton, 2015: 48). In the study, the views of the participants namely teachers and education officials (Provincial Geography Inspector and Provincial Curriculum Officer) regarding the challenges of integrating IK in the teaching of Geography were interviewed from their schools and communities. Interviews and focus group discussions used to generate data were conducted in places where the participants were comfortable as suggested by Patton (2015). The research paradigm understands "humans or objects in their social context" (Pham, 2018: 3). The interpretive paradigm makes use of qualitative methods such as interviews and focus group discussions (Mertens, 2015) which were used in this study to generate data.

Creswell (2013) avers that, a case study uses detailed in-depth data generation techniques and multiple sources of data. In order to ensure that the sample was achieved participants were informed of the pending interviews and focus group discussions so that they can re- schedule their programmes or give another date for the interviews. Selection of participants was done through purposeful sampling. This was to ensure that people with rich information on the challenges on integrating IK in the teaching of weather and climate were selected. Permission was obtained from gate keepers and appointment was done with the participants. Data was generated from interviews and focus group discussions with teachers and ministry education officials as presented below:

-Interview with two (2) Geography teachers from each of the 7 districts to make a total of 14 interviews with Geography teachers in the whole Province;

-Interview with one (1) Provincial Geography Inspector per whole Province;

-Interview with one (1) Provincial Curriculum Officer per whole Province;

-Seven (7) focus group discussions with Geography teachers in the whole province

A list of questions designed in both English and local language, *Shona* for the interviews and the focus groups were used. The teachers understood and speak English fluently but they sometimes switched languages when responding. Convenience sampling was used to select the schools. Convenience sampling was used to select the schools. The choice for convenience sampling was based on easy accessibility, distance from my work place and costs. Etikan, Musa and Alkassim, (2016) suggested that, convenience sampling was conducted based on costs, access and geographical proximity. Since personal resources were used, those schools that were easily accessible by road and within reasonable distance from my residence were selected to reduce on transport costs. The researchers obtained gatekeepers permission. The District Schools Inspector (DSI) assisted the researcher in choosing the schools.

Data was analyzed using qualitative content analysis. The method involved coding and grouping data into main themes (De Wever, Schellens, Valke, and Van keer, 2006; Hsieh and Shannon, 2005). Detailed descriptions using direct quotations were used to present the data as suggested by Cohen, Manion and Morrison (2011). Informed consent forms were provided and signed by all participants before the interviews and focus group discussions with the participants. The next section deals with the context of the study.

Context of study

Manicaland is a province in Zimbabwe situated in the eastern border. It borders with Mozambique on the eastern boundary. The reasons for selecting Manicaland as the study area consists of both cultural, physical and personal reasons.

Cultural and physical reasons for selecting Manicaland

The location for the study was Manicaland because of numerous reasons. There is diversity in religious beliefs, dialects, tribes and physical environments which make the study on indigenous knowledge more interesting as different world views were articulated during the data generation process. This provided rich descriptions with different perspectives regarding the integration of IK into the teaching of weather and climate in the secondary schools. The researcher also chose Manicaland region for study as the researcher was born and bred in the province. The researcher grew up being exposed to looking after goats and cattle. As young boys we were expected to wake up in the morning and to work in the fields. The elders taught the youngsters cultural values such as respect for elders, sharing and being responsible. The virtues of *ubuntu* were promoted in the extended family. As we grew up the elders would teach us to carry out farming activities and predicting how the weather could be forecasted.

FINDINGS

The Geography teachers and educational officials were of the view that, there would be numerous challenges in integrating IK into the teaching of the topic weather and climate in Geography in the secondary schools. These challenges are discussed below.

Lack of documented resources

The Manicaland Province Geography Inspector (MPGI) explained how the lack of documented resources is a challenge to IK integration:

"Most of the information we have is oral. There are not many efficient sources on indigenous knowledge systems on weather and so on. That will be a challenge because when you are to integrate, you must be fully knowledgeable about what you want to teach."

It was evident from MPGI's view that, undocumented sources of information is an impediment to the integration of IK in the teaching of weather and climate. There are few sources on IK that can be used to teach IK in the Geography lessons. The teachers are not fully knowledgeable on the IK content to teach due to lack of documented sources which they can refer to. The teacher also believed that they needed documented sources to refer to during scheming, planning and preparation of teaching.

A teacher (TIMUT1) in an interview expressed how information can be altered when passed from one person to the other orally:

"*The problem with integrating IK is that there is no documentation that we have, the problem is unrecorded information. It lacks consistency, people die with some knowledge before it is passed to the next generation and people not willing to record, as such it lacks coherence of some sort. If my grandmother told my father something before, she dies, the same knowledge impacted by my father to my child Rukudzo she can't say it 100 percent the way it was told by my grandmother*".

It was evident from TIMUTA1's explanation that, the challenge of integrating IK in the teaching of weather and climate was unrecorded information on IK which lacks consistency and coherence. Furthermore, the teacher (TIMUTA1) observed that, as a result of the oral nature of IK, information is altered during transmission from one generation to the other.

Another teacher (CFGCHIP1) in a focus group discussion in Chipinge, believed that, the dialect used in IK textbooks could be a challenge in integrating IK in the teaching of Geography lessons in secondary schools as elaborated below:

"The content of textbooks may vary depending on the dialect used by the author. A textbook written by a Kalanga can differ with the one written by a Ndau author."

Kalanga is a dialect commonly used in Masvingo province whereas Ndau is spoken in the eastern parts of Manicaland, Zimbabwe. The teacher (CFGCHIP1) thus perceived variations in the content of IK textbook content written by authors from different dialect groups as a challenge to the integration of IK in teaching. In Zimbabwe there are different local indigenous languages. Different terms meaning the same thing can be used to explain IK aspects on weather and climate. This variation poses a challenge in understanding IK aspects. For example, a common rain bird used to forecast weather is known by different terms such as *haya or dzvotsvotsvo or koriro* in different dialects within the same province of Manicaland. The integration of IK in the school curriculum in Zimbabwe is a relatively new addition. There is very limited documented material for use in the classroom.

Lack of training by teachers in indigenous knowledge

It was evident that some teachers were not prepared to integrate IK in the teaching of weather and climate in the Geography lessons in secondary schools because they lacked any form of training in indigenous knowledge: One of the participants (TFGCHIP4) stated that:

"We have heard about indigenous knowledge but the challenge is especially that we have not been trained. Teachers need to be trained. Especially myself I am not prepared to teach IK because there is a lot of research. I am not used to change. More so, we have few of these elderly people who can assist us."

The teacher (TFGCHIP4) viewed the lack of training by teachers in IK as a major challenge in integrating IK in the Geography lessons. In addition, the teacher felt that, it is a burden to undertake research on IK in preparation for the lessons. The research study further established that, it was a challenge for the teachers to change from the usual classroom teaching practices to that which involved integrating IK in the teaching. More so, the lack of elderly people with expertise in IK who could assist teaching Geography lessons was regarded as a further challenge of integrating and teaching IK in Geography.

However, it is important to take note of the comments given by MPGI, who gave a counter argument regarding lack of trained teachers. The Geography Inspector (MPGI) proclaimed that:

"Teachers are trained during a certain era and they don't expire with the expiring of a syllabus. They should be able to read and understand these things (referring to IK) and teach them".

The Geography inspector's argument exposes that teachers should be able to adapt to changing learning environments. He argued that, teachers were not trained for a specific syllabus or content of which they should be able to adapt to the new Geography curriculum. MPGI seems to suggest that teachers were supposed to staff develop themselves in order to meet the changing demands in the education sector. The Geography inspector therefore does not view a lack of training by teachers as a hindrance to integrating IK in the teaching of weather and climate in Geography.

Shortage of indigenous experts

One of the teachers (CFGMUT2) explained how shortage of indigenous experts could hamper IK integration in secondary schools:

"I think one of the challenges of integrating IK may be in urban set up, it may be so challenging to get someone, an elderly person who can actually come to help in delivering such a lesson."

The findings from the teacher (CFGMUT2) revealed that scarcity of indigenous experts who are knowledgeable in IK poses a challenge to IK integration in the teaching of weather and climate topic in Geography. The teacher (CFGMUT2) believed that in urban areas, shortage indigenous experts could hamper the teaching of the topic on weather and climate in the secondary schools. The elderly people in urban areas in Zimbabwe often retire to their rural homes once they are no longer employed in these urban areas. This creates a shortage of elderly people who are supposed to be consulted as indigenous experts who can be invited to teach IK in the Geography class on weather and climate in the urban areas.

CFGCHIM4 echoed the views of CFGMUT2, on the shortage of elderly people who would teach IK related to weather and climate in the secondary schools. CFGCHI4 explained:

"Another challenge is that, the elderly people who are knowledgeable are now few at present. As a result, the learners have nowhere to research from, issues on IK."

The teacher (CFGCHIM4) perceived the shortage of elderly people as a challenge of integrating IK in the teaching of the topic of weather and climate in Geography in secondary schools. The shortage of elderly experts in IK within urban areas could hamper research by both teachers and learners.

The MPGI concurred with the teachers that, the shortage of elderly people was an impediment in integrating IK in the Geography lessons on weather and climate:

"The biggest challenge is the source of information. Most of the information we have is oral. We have to extract it from a live person. There are not many efficient sources on IK systems on weather and so on. That would be a challenge because when you are to integrate you must be fully

knowledgeable about what you want to teach. I think this is a major challenge especially for people in urban areas who are no longer in touch with African tradition"

MPGI believed that, the challenge of integrating and teaching IK in the Geography lessons on weather and climate is lack of sources on IK especially for people living in urban areas who are no longer in touch with African traditions. It was evident from both the teachers (CFGMUT2; CFGCHIM4) and Geography inspector (MPGI) that, shortage of elderly people who have expertise in IK was an impediment in integrating IK in the teaching of weather and climate in Geography in secondary schools.

Teachers' prior experiences and background on indigenous practices

Teacher (TFGMUT2) narrated how prior experiences on rain making ceremonies in Nyanga, Zimbabwe, can influence one's perception on indigenous knowledge:

"It was in 1995 soon after the drought period of 1991to 1994.The traditional elders came to the school and announced that enrolment was going to be low on a Thursday as they will be holding mukwerere (rain making ceremony). They did that and were there at the ceremony. They informed us that we were supposed to be near homes or houses as it was going to rain cats and dogs. After the ceremony no rains were experienced over a week from the day of the rainmaking ceremony---from this experience I would personally say these things I don't think they work anymore, they don't work for me, I don't believe in rainmaking ceremonies"

Prior experiences on indigenous practices by teachers was established as a challenge for to integrating and teaching IK under the topic of weather and climate in the secondary schools. The teacher (TFGMUT2) had a negative attitude on *mukwerere* (rainmaking ceremony) after attending a rain making ceremony that failed to yield some rain within the expected period. The ceremony failed to yield some rain despite the community elders promising the teachers some heavy downpours after the rain making ceremony. TFGMUT2 basing on the past experience, believed that these rain making ceremonies no longer have any value as they don't work anymore. A teacher who has got a negative attitude toward indigenous practices does not believe in integrating IK in the teaching of weather and climate in the Geography lessons.

Another teacher (TFGMUT1) concurred with TFGMUT2:

"Mr Risiro, because I don't believe in rainmaking ceremonies, so integrating it is a bit shaky, but a Teacher who believe in it, may integrate IK. I say to a lesser extent we can integrate it because most of the things on IK do not work, maybe they use to work that time but doesn't work now."

The teacher (TFGMUT1) noted that, it was a challenge to integrate and teach IK in the Geography lessons on weather and climate for a teacher who do not believe in indigenous practices such as rain making ceremonies. The teacher was of the view that those teachers who believed in indigenous practices may integrate IK in the teaching of weather and climate.

In another focus group discussion in Chipinge, one of the teachers (TFGCHIP1) was of the view that, the integration of IK in the teaching of weather and climate depends on one's religious inclination, age and past experiences. One of the teachers (TFGCHIP1) narrated:

"I think belief in indigenous practices depends with one's religious inclination as well as age. An elderly teacher who used to witness rain making ceremonies long time ago, can believe in rain making ceremonies, but for a young person who never experienced rain making ceremonies may not believe in it"

The teacher (TFGCHIP1) thought that, the elderly teachers who used to witness some rains after their elders performed *mukwerere* (rain making ceremonies) are more likely to integrate and teach IK in the Geography lessons of weather and climate than the younger generation of teachers. It is therefore evident that, prior experience on indigenous practices and the age of the teacher may be a determinant on integrating and teaching IK in the Geography lessons in secondary schools

Religious beliefs

The findings from the teachers established that, Mission schools could be a challenge to the integration of IK in the teaching of weather and climate in Geography in the secondary schools as one of the teachers (TFGMUT2) narrated:

"And even some of the schools themselves like we have the Catholic schools, we have the Adventist schools, they can even come to an extent of selecting some of the content to teach."

The teachers felt that, the integration of IK in the teaching of weather and climate can be hampered by Mission schools that may select the content to teach in institutions which are under their control.

In Zimbabwe there are schools that are run by churches such as the Catholic and Adventist schools. These schools have their own philosophy, norms and values which they feel should be taught. The responsible authorities at that local level can decide on the curriculum to be taught in the schools. This may pose a challenge to the integration of IK in the teaching of weather and climate in Geography.

The Christian beliefs by parents was also viewed by Manicaland Provincial Curriculum Development Officer (MPCDO) as a challenge to integrating IK in the teaching of weather and climate in the secondary schools:

"Introducing IK is going to be controversial and difficult because the parents themselves won't understand it. This is why up to this day very few (referring to children) can play traditional dance at a school, yet every child can sing Christian songs."

The MPCDO views parents' belief in Christianity as a challenge to integrating and teaching of IK in the Geography lessons. Parents inculcate Christian values among their children as opposed to IK as evidenced by the failure by students to play traditional dance at a school yet the same students can sing Christian songs very well. The view expressed by MPCDO, seem to suggest that, the values and beliefs cherished at the homes and community of the learners have an influence on the learners' acceptance to learn and acquire knowledge on IK in the schools

TFGCHIP4, concurred with the views of MPCDO that, Christianity in Zimbabwe is overriding indigenous traditions thus making it a challenge to integrate and teach IK in the study of weather and climate in Geography in the secondary schools:

"*Right now, our generation grew up when Christianity was overriding these traditions. So now instead of mukwerere (rain making ceremony) we are saying if we go and fast and pray rain will come. God will intervene*."

The teacher (TFGCHIP4) views the dominance of Christianity over indigenous traditions as a challenge to the integration and teaching of IK in the study of weather and climate in Geography. Teacher (TFGCHIP4) views the role of indigenous practice such as *mukwerere* (rainmaking ceremonies) being overtaken by fasting and praying for the rains. The new generation of teachers

and students has grown up in an environment where Christianity is viewed as modern and indigenous practices as ancient and retrogressive.

Urbanisation

The study established from the interview with the Manicaland Province Geography Inspector (MPGI) that, urbanization is perceived as a challenge to the integration and teaching of IK in the Geography lessons in secondary schools as stated below:

"Urbanisation is a challenge especially for people in urban areas here who are no longer in touch with real African tradition."

MPGI believed that, people living in urban areas pose a challenge in integrating and teaching of IK in the study of weather and climate in Geography. The Geography inspector believed that, the people in urban areas are divorced from African tradition as a result both the teachers and the elderly people lacked the knowledge to teach the Geography learners. Rural to urban migration has resulted in people from different backgrounds and culture to mix. In some cases, this has caused cultural erosion and multi-cultural classes that may need special skills to teach. Such skills may be absent from some teachers who did not receive training in indigenous knowledge.

Another teacher (TFGMUT2) revealed that, a diversity of cultures in urban areas presents a challenge in integrating IK in the teaching of weather and climate in the secondary schools as elaborated below:

"In a classroom set up we have got two cultures, those who have the rural background and those with urban background so it would be difficult to incorporate those learners and for them to believe one thing."

TFGMUT2 believed that, it was a challenge to have a common ground on IK content to teach in a multicultural class. Students from rural background have a different culture from those in the urban environment. They view the world with different lenses such that they have a different understanding of IK concepts in the study of weather and climate. The challenge is largely due to learners who will bring to the classroom a diversity of norms, values and cultural practices. This

would make it difficult for the teacher to reconcile learners with these diversified cultural backgrounds.

Assessment Challenges

The findings from the teachers' interviews and focus group discussions revealed that dialectical variations pose a challenge not only in the integration of IK but to the assessment aspects. One of the teachers (TFGCHIM2) explained that:

"As we said earlier on (referring to terms used to describe rainmaking ceremonies) other areas may say makoto (rain making ceremony beer) to describe rain making ceremony; others mukwerere , so we might face challenges standardizing the examination just like standard Shona. Some are Karanga (dialect used in Masvingo), some of us Vanawasu (people from Mutasa area*),I come from Honde valley."*

The teacher (TFGCHIM2) viewed dialect differences spoken across Manicaland as a challenge during assessment of Geography concepts in the secondary schools. The teacher (TFGCHIM2) observed that, rain making ceremony is known by different terms in different parts of Manicaland. The variations in the dialect spoken by both the teacher and the student may pose some challenges during an assessment of weather and climate in Geography.

The view by TFGCHIM2 on the terminology used to refer to rain making ceremony was echoed by other participants in other parts of Manicaland. The term *makoto* was mentioned by TFGCHIM2 in the eastern part of Chimanimani. In the western part of Chimanimani (TFGCHIM1; CFGCHIM1) used the term *zvitsanza* to describe the same rain making ceremony. In Chipinge (CFGCHIP4) rain making ceremony is referred to as *doro remutere*. The variations used to describe the same aspect of weather and climate poses a challenge to the markers who may not be familiar with the dialect used by the learner.

The research further established from the teachers' focus group discussions that, IK is geographic specific as such, geographic variations of IK was a challenge in integrating IK in the teaching of weather and climate in the secondary schools. Teacher (TFGBHU3) asserted:

"May be on assessment, if it is summative assessment, these IKS differ from one area to another. May be the things we are doing here in Manicaland, they are not the same things that are done in Matabelaland, so when it comes to summative assessment it becomes a problem".

The teacher (TFGBHU3) perceives geographic specific nature of IK as a challenge of teaching IK in the studies of weather and climate. The teacher observed that, IKS differed from one area to another. Some indigenous practices for example from Manicaland may vary with those practiced in Matabeleland. This poses a challenge during summative assessment of weather and climate in the secondary schools.

It was evident from the teachers' interviews and focus group discussion that, indigenous knowledge is geographic specific. The indigenous practices and terminology used to describe geographical phenomenon may also vary over space. This will pose a challenge during assessment of weather and climate in Geography in secondary schools.

Discussion

The value of IK for Zimbabwean learners should not be underestimated. The use of indigenous knowledge in complementing modern methods in weather forecasting and mitigation of weather hazards has been effectively used in Tanzania (Mhita, 2006) and in Western Kenya (Thompson Reuters Foundation, 2012). Nevertheless, teachers believed that including IK in the Geography curriculum in Zimbabwe, in the section on weather and climate would have numerous challenges. The teachers stated that they are not knowledgeable on what to teach in IK due to lack of documented sources reference materials. Elsewhere, the shortage of learning materials was found as an impediment to the full implementation of indigenous technology and culture in South Africa (Vandeleur, 2010). The teachers do need documented sources to refer to for their schemes of work, planning and preparation of teaching notes. The available books that are currently being used in schools in Zimbabwe have been largely imported from Britain and portray a British culture as illustrated by Shizha (2006) and Mavhunga (2006). Jekede (1999) also noted that, IK is orally transmitted and some of the information can be lost during transmission. The lack of resources in integrating IK was observed also in a research carried out at North West University, South Africa (Mmola, 2010). Zimbabwean Geography teachers were also reluctant to introduce IK into

Geography as they believed that, they lacked training in indigenous knowledge to do so. In South Africa, Vandeleur (2010) found out that the lack of a qualification in indigenous knowledge by teachers hampered the teaching of indigenous technology and culture as the teachers lacked confidence to teach the subject matter. The shortage of human resources has been emphasized by Mmola (2010) in his study at North West University who noted that, shortage of teaching staff in IK was a hindrance to integration of IK in the classes. A research carried out by Dennis (2010) in Canadian schools revealed that teachers invited community elders to deliver lessons on local traditions. The current study also revealed a shortage of indigenous experts in the community.

Teacher's own background can either enhance or hinder the teaching of IK as observed by Vandeleur (2010) in the study of the South African indigenous technology and culture curriculum. Teachers in the current study, who lack an indigenous background therefore had a negative attitude toward indigenous practices as they did not believe in integrating IK in the teaching of weather and climate in the Geography lessons in secondary schools. In the South African context, Vandeleur (2010) found that, teachers who were exposed to indigenous technology and culture were more prepared to implement the new curriculum on culture and technology. On the contrary, those teachers who had westernized background found it difficult to implement the new curriculum on indigenous technology and culture. Similarly, findings presented by Mclaughlin and Whatman (2015) in their study of the Aborigines in Australia noted that urban teachers who did not have connections with Aborigines found it difficult to integrate indigenous knowledge in the classroom. Religious influences can impact on the insertion of IK into classroom practices. Shizha (2006) observed that colonial education in Zimbabwe regarded indigenous knowledge as primitive and irrelevant to their economic interests. Those schools who regard indigenous education as inferior may resist incorporating IK in the teaching of weather and climate in the secondary schools.

Conclusions and some recommendations

The views expressed in this study report on several anticipated challenges in integrating IK in the teaching of weather and climate. The findings reveal from the views of teachers that, a lack of documented resources and training of teachers in IK was a challenge in integrating IK in the teaching of weather and climate. There is scarcity of Zimbabwean relevant source materials such as textbooks on IK for use in the schools. This makes it difficult for the teachers to undertake

schemes, plan or prepare notes to teach. The attitude and belief systems of the teachers are yet another hindrance to IK integration. Some teachers due to their religious beliefs and previous experiences do not believe in indigenous traditions. They are therefore not prepared to teach IK in the secondary schools. On the other hand, some of the teachers believe that IK has been replaced by modernization and Christianity. The teachers felt that some of the schools run by religious organizations prescribe content to teach in their schools thus posing a challenge of integrating IK in the Geography curriculum. Variations in IK concepts due to different dialects used in Manicaland province presents a challenge to the learners when learning for assessments and to markers in the summative examinations. Thus, there would have to be some strategic decisions taken on which dialect/dialects to foreground because it would be impossible to include all in the curriculum.

The teachers therefore propose team writing of IK text books so that information from diverse backgrounds of authors can enrich IK content in the schools. Staff development was proposed to equip the teachers with content and IK methodologies. Ultimately, the integration of indigenous knowledge in the teaching of weather and climate is one path way to reclaim the Zimbabwean national identity and cultural values that was removed when colonial education was imposed. The integration of IK in the teaching of weather and climate in the secondary schools will enrich existing knowledge when teachers are trained, it will grow learner understanding of geographical concepts by making lessons more learner and community-centered if indigenous experts from the community are allowed to feed their knowledge into lesson content. If IK is included in the Geography curriculum in the section on weather and climate, it could be valuable in providing the skills of weather forecasting that have been used by the indigenous people to the new generation of learners. This would complement modern methods of weather forecasting in providing more reliable forecasts.

Mr Joshua Risiro is a Senior Lecturer at the Great Zimbabwe University, in Zimbabwe - Jrisiro@gmail.com

References

Aguado, E., & Burt, J.E. (2010). *Understanding weather and climate. New* York: Prentice Hall.

Aikenhead, G. S. (1996). Cross Cultural Science Teaching for Aboriginal Students. Kanu, Y. *Curriculum as cultural Practice: Post-colonial Imagination,* 223-248. Toronto, Canada: University of Toronto Press

Aikenhead, G. S., & Michell, M. (2011). *Bridging Cultures: Indigenous and Scientific Ways of Knowing Nature*. Toronto, Ontario: Pearson Canada Inc.

Barnhardt, R., & Kawagley, A. O. (2005). Indigenous Knowledge Systems and Alaska Native Ways of Knowing. *Anthropology and Education, 36*, 1 8 - 23.

Baskin, C. (2006). *Circles of inclusion: Aboriginal world views in social work education (Unpublished doctoral dissertation)*. Ontario Institute for Studies in Education (OISE), University of Toronto, Toronto.

Breidlid, A. (2009). Culture, indigenous knowledge systems and sustainable development: A critical view of education in an African context. *International Journal of Educational Development*, 29140–148.

Carter, L. (2006). Post-Colonial Interventions within Science Education: Using Post-Colonial Ideas to Reconsider Cultural Diversity Scholarship: *Educational Philosophy and Theory*, 38, 677-691.

Cohen, L., Manion, L., & Morrison, K. (2011). *Research Methods in Education*. London and New York: Rutledge.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education*, 8th ed. London and New York: Routledge.

Creswell, J.W. (2013). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches.* Los Angeles: SAGE.

Cushner, K., McClelland, A., & Safford, P. (2012). *Human diversity in education: An intellectual approach* (7th ed.). New York: McGraw Hill.

De Villiers, M. R. (2005). Three Approaches as Pillars for Interpretive Information Systems Research: Development research, action research and grounded theory. *Proceedings of SAICSIT,* 2005,

De Wever, B., Schellens, T., Valcke, M., & Van Keer, H. (2006). Content analysis schemes to analyze transcripts of online asynchronous discussion groups: A review. *Computer & Education,* 46, 6-28

Dei, G. J. S. (2000) Rethinking the role of indigenous knowledge in the academy. *International Journal of Inclusive Education*, 4(2), 111-132.

Dei, G. J. S. (2013). Indigenizing the School Curriculum: The Case of the African University. *Proceedings of the Fourth International Conference of the Science and Indigenous Knowledge Systems Project/ South African-Mozambican Collaborative Research Programme, 162-177*. University of the Western Cape, Cape Town, South Africa.

Dennis, V.S.T. (2010). *A Study of Aboriginal Teachers' Professional Knowledge and Experience in Canadian Schools*, University of Saskatchewan.

Dreyer, J. M. (2018). Indigenous Knowledge Systems and Africanisation in relation to Geography teaching. Van Eden, E. S. & Warnich, P. (Eds). *Teaching and Learning History and Geography in the South African Classroom.* Pretoria: Van Shaik Publishers.

Etikan, I., Musa, S. A., Alkassim, R. S. Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics. 5(*1), 1-4.

Fanon, F. (1967). *Black skin, White masks*. Broadway, NY: Grove Press.
Gay, G. (2010). *Culturally responsive teaching: Theory, research, & practice* (2nd Ed.). New York: Teachers College Press.
Govender,N, Mudaly,R. & A James(2016) Engaging Indigenous Knowledge Holders in Teaching Preservice Teachers in IKS Food Production and Practices: Implications for Higher Education , Alternation, - alternation.ukzn.ac.za
Government of Zimbabwe (1999). *Report of the Presidential Commission of inquiry into Education and Training.* Harare: Government Printers
Hewson, M. G. (2015). *A Review of Embracing Indigenous Knowledge in Science and Medical* Teaching. London: Springer.
Hewson, M.G., & Ogunniyi, M.B. (2011). Argumentation teaching as a method to introduce indigenous knowledge into science classrooms: Opportunities and challenges. *Culture Studies of Science Education,6, 679-692.*
Hsieh, H.F., & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research,* 15(9), 1277-1288.
Jay, G. (2011). *What is Multiculturalism.* University of Wisconsin: Milwauke.
Jegede, O, (1999). Science Education in non western cultures: Towards a theory of collateral learning. In What is Indigenous Knowledg? Eds. Samali & Kincheloe *Voices from Academy.* Newyork and London: Falmer Press
Katrina, M., & Jill, A. (2019). Weaving an interpretivist stance throughout mixed methods research, *International Journal of Research & Method in Education*, 42 (3), 225-238.
Kawagley, A., Norris, O., &Norris, R.A. (1998). The Indigenous Worldview of the Yupiaq culture: Its Scientific Nature and relevance to the practice and teaching of science. *Journal of Research in Science Teaching, 35(2), 133-144.*
Khupe, C. (2014). Indigenous Knowledge and School Science: Possibilities for integration. A Thesis submitted to the Faculty of Science, University of Witwatersrand, Johannesburg
Knight, K. (2008). *Griffith Working Papers in Pragmatics and Intercultural Communication* 1, 2,
Kymlick, W. (2012). *Multiculturalism: Success, Failure and the Future*. Berlin: Transatlantic Council on Migration.
Magwa, W. (2008). *Planning for the Future: Exploring Possibilities of Using Indigenous African Languages of Instruction in Education-The Zimbabwean Experience, PHD Thesis* University of South Africa.
Mapara, J. (2009). Indigenous Knowledge Systems in Zimbabwe: Juxtaposing Post-Colonial Theory. *The Journal of Pan African Studies*, 3(1), 139-155.
Mawere, M. (2015). Indigenous Knowledge and Public Education in Sub-Saharan Africa. *Africa Spectrum,* 50 (2), 57-71.
Matsika, C. (2012). *Traditional African Education: Its Significance to Current Educational Practices-with Special Reference to Zimbabwe*. Gweru: Mambo Press.
Mavhunga, F. (2006). Africanising the School Curriculum. A Case for Zimbabwe. In F. Zindi (Ed.). *The Zimbabwe Journal of Educational Research, 18 (3), 440-456.*
Mclaughlin, J. & Whatman.S. (2015). Embedding indigenous knowledges**.** An Australian Case Study of Urban and Remote Teaching Practicum. Majhanovich & R. Malet (Eds.). *Building Democracy through Education on Diversity*, 57–76, Sense Publishers.
Mcleod, S. (2014). *Levy Vygotsky Simple Psychology*. Retrieved from https://www.simplypsychology.org/vygotsky.html retrieved 20 July, 2019

Melchias, G. (2001). *Biodiversity and Conservation.* Enfield: Science Publishers, Inc.
Mertens, D. M. (2015). *Research and Evaluation in Education and Psychology,* 4th ed. London: Sage Publications.
Mhita, M. S. (2006). *Training Manual Traditional Knowledge for Nature and Environmental Conservation, Agriculture, Food security and Disaster Management in Tanzania* Retrieved http://www.unep.org/ik/PDF/Tanzania%20Ik%20Training%20M ANUAL. pdf. Retrieved 23 January, 2015.
Mmola, S. (2010). *A survey of perceptions of IKS students and IKS lecturers on IKS Programme at North-West University (Mafikeng Campus). Unpublished manuscript, IKS Programme,* North-West University, Mafikeng Campus.
Mosweunyane, D. (2013). The African Educational Evolution: From Traditional Training to Formal Education. Higher Education Studies, 3,4.
Muguti, T., & Maphosa, R. (2012). Indigenous Weather Forecasting: A Phenomenological Study Engaging the Shona of Zimbabwe. *Journal of Pan African Studies*, 4(9), 102-112
Mungwini, P. (2013). The Challenges of Revitalizing an Indigenous and Afro Centric Moral Theory in Postcolonial Education in Zimbabwe. *Educational Philosophy and Theory,* 43(7), 773-787.
Mutekwe, E. (2015). Towards an Africa Philosophy of Education for Indigenous Knowledge Systems in Africa. Creative Education, 6, 1294 – 1305.
Nakata, M. (2003). Indigenous Knowledge and the Cultural Interface: Underlying Issues at the Intersection of Knowledge and information Systems. In A. Hickling-Hudson., J. Mathews, & A. Woods (Eds.). *Disrupting Preconceptions: Post Colonialism and Education.* Flaxton: Post Pressed.
Nherera, C.M. (2000). Globalisation, qualifications and livelihoods: The case of Zimbabwe. *Assessment in Education*, 7 (3), 335-363.
Ogunniyi, M. B. (2011). The Context of Training Teachers to Implement a Socially Relevant Science Education in Africa. *African Journal of Research in Mathematics, Science and Technology Education*, 15(3), 98-121
Ogunniyi, M. B. (2016). Explicating the Philosophy of *Ubuntu* into Science Education: A Project Experience. *In the Proceedings of SAARMSTE 24th Annual Conference at Tshwane University of Technology,* South Africa, 12-15 January, 417-431
Ogunniyi, M.B., & Ogawa, M. (2008). The prospects and challenges of training South African and Japanese educators to enact an indigenized science curriculum. *South African Journal of Higher Education,* 22(1), 417-431
Patton, M. (2015). *Qualitative Research and Evaluation Methods*. 4th Edition, Sage Publications, Thousand Oaks.
Pham, L. (2018). *Qualitative Approach to Research, A review of Advantages and Disadvantages of three paradigms: Positivism, Interpretivism and Critical Inquiry*. University of Adelaide: ResearchGate. Doi: 10.13140/RG.2.2.13995.54569 retrieved 12 August 2019
Pedzisai, C. (2013). Teachers' Perceptions on Inclusion of Agricultural Indigenous Knowledge Systems in Crop Production: A Case Study of Zimbabwe's Ordinary Level Agriculture Syllabus (5035). *Journal of Biology, Agriculture and Health Care, 3*(16), 37-44.
Rosado, C. (1997). *Rosado consulting for change in human systems*, pp 1 - 11. Retrieved from www.rosado.net 12 January, 2015.

Saunders, M.; Lewis, P.; & Thornhill, A. (2009). *Research Methods for Business Students,5th ed*. Harlow: Prentice Hall.

Shava, S. (2005). Research on Indigenous Knowledge and its application: A case of wild food plants of Zimbabwe. *Southern African Journal of Environmental Education*, 22, 74-82

Shizha, E. (2006). Legitimising Indigenous Knowledge in Zimbabwe: A Theoretical Analysis of Post-Colonial School Knowledge and its Colonial Legacy. *Youth and Children's Study, Paper 2.* http://works.bepress.com/e_shizha/11 retrieved 20 July 2017

Shizha, E. (2008). Indigenous? What Indigenous Knowledge in Zimbabwe? Beliefs and Attitudes of Rural Primary School Teachers Towards Indigenous Knowledge in the School Curricula in Zimbabwe. *Youth and Children's Studies, 2*, 234-342.

Shizha, E. (2010). The Interface of Neoliberal Globalization Science Education and Indigenous African Knowledge in Africa *Journal of Alternative Perspectives in the Social Sciences*, 2 (1), 27-58

Shoko, K. (2012). Indigenous weather forecasting systems: A case study of the biotic weather forecasting indicators for wards 12 and 13 in Mberengwa District, Zimbabwe. *Journal of Sustainable Development in Africa*, 14, 92-114.

Sigauke, A.T. (2016). UBUNTU/HUNHU in Post-Colonial Education Policies in Southern Africa: A Response to Connell's Southern Theory and the role of Indigenous African Knowledges in the Social Sciences. In A, J. Hudson, P. Mayo &M. Raykov (Eds.). *Post-Colonial Directions in Education*, 5(1), 27 -53.

Skutnabb-Kangas, T., & Dunbar, R. (2010). Indigenous children's education as linguistic genocide and a crime against humanity? A Global View.*Gáldu Čála—Journal of Indigenous Peoples Rights,* 1. Resource Centre for the Rights of Indigenous Peoples Guovdageaidnu/Kautokeino.

Stanley, W. B. & Brickhouse, N. W. (2001). Teaching Sciences: The multicultural question revisited. *Science Education*, 85 (1), 35-49

Tatira, L. (2000). The Role of Zviera in Socialisation. In Chiwome, E; Mguni, Z & Furusa, M. [Eds]. *Indigenous knowledge in Africa and Diaspora Communitie* Harare: University of Zimbabwe.

Tefflo, L. (2013). Rural Communities as Sites of Knowledge: A Case for African Epistemologies. *Indilinga African Journal of Indigenous Knowledge Systems*, 12(2), 188-202.

Thomson Reuters Foundation Report. (2012). *Traditional Weather Forecasting in Western Kenya.*

Vandeleur, S. (2010). Indigenous Technology and Culture in the technology Curriculum: Starting the Conversation, A case study, *Thesis, Doctor of Philosophy*, Rhodes University.

Zinyemba, T. (2015, June 3 - 5). *The Sunday Mail.*