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Using Ubuntu Values in Integrating African Indigenous Knowledge into Teaching and Learning: A Review of Literature

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Abstract. The South African government has developed and incorporated African Indigenous Knowledge (AIK) in the school curriculum however, efforts to integrate AIK in teaching and learning have not yielded the desired results. The study, sought to investigate how AIK is integrated into teaching using Ubuntu values and the implications on teaching and learning in the classroom. Premised on Ubuntu theory, the study adopted an integrated literature review approach, and a comprehensive electronic search was done which led to the discovery of articles that are relevant to the study. A total of 36 out of 54 articles published between 2010-2021 were selected and reviewed. The findings from the literature revealed that much research has not been done to develop strategies that assist teachers to integrate AIK into their lessons. The data also showed that there was a lack of professional teacher development programs meant to equip teachers teaching AIK with the necessary pedagogical skills required in their classrooms. The study concluded that the integration of AIK in teaching and learning at classroom level was still not adequate. The study, therefore, that more continuous professional teachers' development programs be implemented on a regular basis while adopting strategies used to integrate AIK in teaching and learning.

Keywords: African Indigenous knowledge; Integration; Teacher professional development; Ubuntu

1. Introduction and Background

This paper argues the relevance of integrating African Indigenous Knowledge (AIK) using Ubuntu values in teaching and learning. The concepts African Indigenous Knowledge (AIK) and Indigenous Knowledge (IK) are used interchangeably to mean African knowledge that is transmitted and acquired by

African means. There is a way or system in which IK is acquired. This is called the African Indigenous Knowledge System (AIKS) and it consists of the oral tradition, which includes folklores storytelling and practical practices that form the indigenous way of life of people (Mutekwe, 2015). It also involves the mentoring and training of apprentices by indigenous knowledge holders who are experts in their respective fields, such as: traditional medicine, agriculture, pottery, art, and music, among others (Mutekwe, 2015; Nxumalo & Mncube, 2018). This practice represents the way of life of indigenous people, which has over the years been transmitted from one generation to date. In South Africa and throughout Africa, integrating IK into the curriculum is a new topic of study that calls for extensive investigation (Jacobs, 2015; Mkosi, 2019; Moyo, 2011; Keane, Khupe & Seehawer, 2017). According to Magni (2017), IK is that body of information that entails developing a local knowledge system via repeated exposure to cultural practices and experiments. Additionally, it includes indigenous knowledge of animal husbandry, the process of agricultural development, beliefs about weather and climatic conditions, and the orientation and beliefs of the locals regarding land and the sea as well as their use (Magni, 2017). Indigenous Knowledge is therefore, that portion of knowledge that cannot be separated from the indigenous people; and not only it is practical and specific but it is also gathered over time (Keane et al., 2017). Indigenous Knowledge is a system of knowledge that includes oral tradition, proverbs, maxims, poems, songs, and indigenous games as well as, sociocultural structures like rites of passage, norms, and customs. According to Mawere (2015), the local health system, a preventive medication that includes psychiatric treatment, and the reproductive system are examples of where IK plays an important role. Indigenous Knowledge has been a topic of discussion around the globe for some time, but not much has been done to include it in school curriculum in Africa. There is also a dearth of literature that focuses on how IK is integrated in teaching and learning. As such, it has been argued by other scholars that it is long overdue for IK to be recognized as a subject area within the school curriculum (Maware, 2015). The Ubuntu Philosophy is an African philosophy that emphasizes humanity and sense of being human by sharing love, respect, togetherness, interconnectedness, and affection to people (Mubangizi & Kaya, 2015). This paper sought to look at how Ubuntu as an African philosophy is embraced in teaching IK in the classroom, an area that seems not to have been adequately explored by reviewing relevant literature on integrating AIK into the school curriculum.

The value of using AIKS in classroom instruction and the need to provide a framework to support the teaching and learning process are hotly contested issues in South Africa (Mushayikwa & Ogunniyi, 2011; Matike, 2012; Cronje Beer & Ankiewicz, 2015; Mapara, 2017). The efforts by the South African government to establish the IK as a content area in the school curriculum have not produced the intended results (Jacob, 2015). This problem is partially attributable to researchers' incapacity to produce scientific research at par with that of researchers in industrialized nations (Dziva, Mpofu & Kusure, 2010). This may also be owing to the curriculum's colonial orientation, which hindered the incorporation of local knowledge because of its alleged unscientific nature (Jacob, 2015; Mapara, 2017; Mahlangu & Garutsa, 2019). Furthermore, this might be an indication that Ubuntu principles have been neglected in the integration of AIKS into teaching and

learning in the classroom. Indigenous knowledge must be effectively taught and learned within the education system. Since there are no set procedures in place for teachers to employ AIKS in the classroom setting, it is necessary to increase the ability of the school leadership and subject advisers in valuing the Ubuntu principles. This will ensure that the implementation of the teaching and learning of indigenous knowledge (Krakouer, 2015; Nxumalo & Mncube, 2018; Mkosi, 2019).

Before 1994 the educational system in South Africa was designed in such a way that it served the interest of the dominant class and was used as a tool to perpetuate inequalities. Even with the inception of democracy after 1994 the curriculum was still not addressing the inequalities and attempts to transform the education system were not yielding the desired results (Christie,2010; Abah, Mashebe & Denuga, 2015).

As time went on, teachers started to adopt ideas, themes, and content derived from local/indigenous knowledge in their instruction marking the beginning of the movement to incorporate African indigenous knowledge into the school curriculum (Dziva et al., 2010). There is no question that these themes and sub-themes were not recorded, but rather were the result of the people's daily actions. The indigenous people had a wide variety of belief systems, as a result, they ought to play a significant role in teaching and learning of IK. The lack of tools to direct instructors in incorporating indigenous knowledge into their classes is further confirmed by (Dziva et al., 2010; Moyo, 2011; Jacobs, 2015; Mkosi, 2019). It therefore, follows that teachers teaching IK maybe using different strategies that are not coordinated in classroom teaching. Mosimege (2005) and Handayani, Wilujeng and Prasetyo, (2018) mentioned strategies to be used in the implementation of IK in South African schools which are fragmented, connected, sequenced, and integrated. Some of these strategies are expected to provide a direction that will affirm African cultural values, develop them in line with the western world and ensure their contribution to boosting the economy. This is one of the major setbacks in the integration of IK into the curriculum. As such, stakeholders within the education system need to fashion appropriate strategies that will guide teachers in teaching indigenous knowledge in their lessons.

Researchers in the field of IK like Jacob (2015); Abah et al. (2015) view the problem of integrating indigenous knowledge into teaching and learning as a lack of clear strategies that can be adopted by teachers in the classrooms. Also noted, is the absence of professional teacher development program (PTDP) for teachers teaching indigenous knowledge. Another challenge is the lack of content knowledge by teachers teaching IK (Mkosi, 2019).

Having noted all these challenges that hinder the effective integration of IK in teaching and learning, it has been observed that no concerted effort at addressing these gaps has been put in place by government and other critical stakeholders. The government over the years seems to have failed to develop strategies that will assist holistic integration of IK in a teaching and learning setup.

This paper, therefore, reviewed the literature to address problems preventing the integration of IK into teaching and learning in the classroom using the Ubuntu philosophy. This paper also seeks to address what needs to be done to develop IK

in South Africa to compete with developed countries. The question this paper seeks to address is how can AIK system be integrated into teaching and learning using the Ubuntu philosophy.

2. Ubuntu an African philosophy of education

We use Ubuntu philosophy as a theoretical framework to discuss how IK is integrated in teaching and learning in schools. In contrast to an individual value, the Ubuntu philosophy is the as a theory, emphasizes the value of collective existence within the community. It encourages an individual sense of agency and morality (Mbeje, 2010). The idea of Ubuntu comes from the native African Bantu philosophy and wisdom, which portrays the human character as being based on spirituality and discloses people's identity about the rest of the world and all of God's creation. The Ubuntu ideology asserts that all humans and all forms of creation share common links or understandings (Mubangizi & Kaya, 2015). Ubuntu's philosophy emphasizes humanity, fairness, justice, and an African value system (Qobo & Nyathi, 2016). This theory assisted the researchers to understand how AIK is embraced in teaching and learning. The Ubuntu theory is relevant because it assists the researchers to understand how IK is integrated in teaching and learning in the classroom. Moreover, this theory is ideal because it can guide teachers on how to help learners to appreciate the need to embrace the spirit of togetherness, sharing of ideas, common understanding as well as, inculcating the skill of fairness, humanity, justice within the context of African Indigenous Knowledge.

3. Research Method

This paper followed a literature review approach on IK and appropriate strategies that can be utilized by teachers in integrating IK into their lessons. The integrative literature review approach was utilized to collect data. This research methodology approach involves thoroughly reading, analyzing, and sorting out literature to identify the essential attributes of materials (Snyder, 2019). It is a non-contact method that also critiques the existing literature about a topic under study and does not involve objects or person. A researcher is compelled to obtain as much as possible published material on the topic under study by searching multiple databases. The search was conducted on the title, sometimes keywords on the title and sub-themes like the notion of IK; integration of indigenous knowledge; strategies adopted by teachers for teaching indigenous knowledge in the classroom; and current debates on IK. This led to the discovery of Eighty-two articles that were sourced from different databases such as Google scholar, Eric, Science direct, Research Gate and Scopus to research peer-review journals. These articles were pruned down to fifty-four to have only articles published from 2010 – 2021. Seventeen out of these articles were close access and the researchers could not access them. In total, thirty-six articles representing 66.7% were reviewed by the researchers. These articles were published between 2010 and 2021. This review is categorized into the following: the notion of indigenous knowledge, integration of IK into the curriculum, current debate on IK, teacher view on issues of integration of IK into their lesson, and the extent of support for the integration of IK into the curriculum.

Table 1. Showing important characteristics of selected articles on IK, AIK and Ubuntu

S/N	Author (Year)	Title	Country	Research Design	Sample/Population
1	Abah et. al. (2015)	Prospect of integrating African indigenous knowledge systems into the teaching of sciences in Africa	Namibia	Qualitative	Literature
2.	Aldous & Rogan (2013)	The implementation of the Natural Science outcome three: Embedding in the learning of science in societal and environmental issues	South Africa	Mixed method	Grade 8 and 9 students
3.	Akinola & Uzodike (2018).	Ubuntu and the quest for conflict resolution in Africa	South Africa	Qualitative	Document
4.	Christie (2010)	The complexity of human rights in global times: The case of the right to education in South Africa	South Africa	Qualitative	Document analysis
5.	Cronje et al. (2015)	The development and use of an instrument to investigate science teachers' views on indigenous knowledge	South Africa	Qualitative	Science teachers
6.	Dziva et al. (2010)	Teachers' conception of indigenous knowledge in science curriculum in the context of Mberengwa District, Zimbabwe	Zimbabwe	Qualitative	5 Science teachers (2 schools).

7.	Handavani et al. (2018)	Elaborating Indigenous Knowledge in the Science Curriculum for the Cultural Sustainability	Indonesia	Qualitative	Document analysis of indigenous community of Javanese people and Science syllabi.
8.	Hlatshwayo & Shawa (2020).	Towards a critical re-conceptualization of the purpose of higher education: the role of Ubuntu-currere in re-imaging teaching and learning in South Africa higher education	South Africa	Qualitative	University teachers and students
9.	Jacob (2015).	The classroom implementation of indigenous knowledge in the science curriculum by science teachers in the Western Cape Province, South Africa	South Africa	Mixed method	370 Teachers (80 Schools)
10.	Kaya & Seleti (2013).	African indigenous knowledge systems and relevance of higher education in South Africa.	South Africa	Qualitative	University Lecturer and students
11	Keane et al. (2017)	Decolonising methodology: Who Benefits from indigenous knowledge research?	South Africa.	Qualitative	Science teachers
12.	Khupe (2014)	Indigenous knowledge and school science: Possibilities for integration	South Africa	Qualitative	Secondary school students
13.	Krakouer (2015).	Literature review relating to the current context and discourse on Indigenous cultural	Australia	Qualitative	Literature/Articles

		awareness in the teaching space: Critical pedagogies and improving Indigenous learning outcomes through cultural responsiveness			
14.	Magni (2017).	Indigenous knowledge and implications for the sustainable development agenda	Switzerland	Qualitative	Indigenous community members
15.	Mahlangu & Gurutsa (2019).	A transdisciplinary approach and indigenous knowledge as transformative tools in pedagogical design: the case of the center for transdisciplinary studies, University of Fort Hare.	South Africa	Qualitative	University students/Lecturer
16.	Mapara (2017).	Binarism as a recipe for lukewarm research into indigenous knowledge systems in Zimbabwe. In: Handbook of research on theoretical perspectives on indigenous knowledge systems in developing countries	Zimbabwe	Qualitative	Document analysis
17.	Matike (2012).	Knowledge and perceptions of educators and learners on the incorporation of indigenous	South Africa	Qualitative	Science teachers

		knowledge into the school curriculum. In J. A. Smit, J. & M. A. Masoga (Eds.), African indigenous knowledge systems and sustainable development: Challenges and prospects.			
18.	Maware (2015).	Indigenous knowledge and public education in sub-Saharan Africa.	Zimbabwe	Qualitative	Document
19.	Mavuso et al. (2021).	Integration of Indigenous Knowledge in the Intermediate Phase Curriculum: A Case of South African Schools.	South Africa	Qualitative	Primary school teachers and subject advisors.
20.	Mbeje (2010).	Ubuntu	South Africa	Qualitative	Document
21.	Knight (2015).	Teachers' experiences of indigenous knowledge systems (IKS) found in the life sciences curriculum: A case study of life sciences teachers at a high school in the Pinetown District	South Africa	Qualitative	Life sciences teachers
22.	Mkosi (2019).	Indigenous knowledge systems policy in South Africa: Development of digital libraries and implications for benefit sharing and intellectual property	South Africa	Mixed method	Primary school teachers and Subject advisors.

24.	Moyo (2011).	African indigenous knowledge systems and Human rights: implications for higher education, based on the South African experience.	South Africa	Qualitative	Ten science teachers
25.	Mubangizi & Kaya (2015).	Modeling the integration of IKS into the teaching and learning of Science. In *Proceedings from the 19th conference of the Southern Association of Research in Science, Mathematics and Technology Education*	South Africa	Qualitative	University teachers and students (2 Universities in South Africa)
26.	Mushayikwa & Ogunniyi (2011).	Towards an Africa philosophy of education for indigenous knowledge systems in Africa.	South Africa	Qualitative	2 Masters students
27.	Mutekwe (2015).	South African Grade 9 teachers' and learners' knowledge about medicinal plants and their attitudes towards their integration into the science curriculum	South Africa	Qualitative	Policy Document analysis
28.	Muza (2013).	Towards a cartography of indigenous knowledge systems in library and information science training and education in Anglophone	South Africa	Qualitative	Grade 9 teachers and Learners.

		eastern and southern Africa			
29.	Ngulube et al. (2015).	Towards a cartography of indigenous knowledge systems in library and information science training and education in Anglophone eastern and southern Africa	Eastern and southern Africa	Mixed method	Senior university staffs
30.	Nxumalo & Mncube (2018)	Using indigenous games and knowledge to decolonize the school curriculum: Ubuntu perspectives.	South Africa	Qualitative	3 isiZulu games (Ushumpu, Umngcwabo and Ukungcweka)
31.	Qobo & Nyathi (2016).	Ubuntu, public policy ethics and tensions in South Africa's foreign policy.	South Africa	Qualitative	Policy document
32.	Quan-Baffour (2014).	Unity in diversity: Ubuntu in the classroom to promote learning among adults from diverse backgrounds.	South Africa	Qualitative	Secondary school teachers.
33.	Regmi & Fleming (2012).	Indigenous knowledge and science in a global age.	Israel	Qualitative	Students from Bedouin and Jewish communities
34.	Waghid et al. (2018).	Rupturing African philosophy on Teaching and learning: Ubuntu justice and education	South Africa	Published book	Published book
35.	Zinyaka (2013).	Onwu and Mosimege on "Indigenous knowledge	South Africa	Qualitative	Document (Science curriculum)

		systems and science and technology education: A dialogue": Some remaining issues			
36.	Zinyeka et al. (2016).	A truth-based epistemological framework for supporting teachers in integrating indigenous knowledge into science teaching.	Zimbabwe	Qualitative	Science teachers

4. The Notion of Indigenous Knowledge

It emerged from the literature that the term IK can be viewed differently by societies across the globe. Some see it as a way of solving daily socio-economic problems, others viewed it as a way of addressing environmental problems and adapting to changes in their immediate environment (Mawere, 2015). In a bid to provide a modern understanding of IK, Maware (2015) also refers to indigenous knowledge based on the United Nations (UN) definition as a system of practice that is indigenous to the people and accepted within the community where they exist. This practice is dated back to the periods before the adventure of colonial rule, especially in Africa; were there are strong ties with the people's language, history within a territory that is indigenous to them. These practices have a strong socio-economic and governance and provide an environment that is known to be indigenous and acceptable by all the communities as home to them.

Indigenous Knowledge has been conceptualized in different ways by different researchers, notable among them are (Maware, 2015 & Shisha, 2013). These researchers align with the views of Magni, (2017) and Jacob (2015) who defines IK as that knowledge that is synonymous with people's tradition, local knowledge developed by the indigenous people in a given community different from that of the developed world that comes about by researchers from universities, government, and other stakeholders. It is therefore, correct to say that IK is synonymous with people's cultural beliefs, language, socio-economic system, and inventions of traditions which the people are identified with, and which form the basis of their existence. These belief systems have been in existence with the indigenous people that occupied the lands in Africa before the invasion of the colonist and being transferred from one generation to another.

5. Integration of IK into teaching and learning process

Debates on the integration of IK into the school curriculum have been ongoing. Mavuso, Olawale, and Mkosi (2021) examined the role of teachers, subject advisors, and HODs in the integration of IK into the classroom at the intermediate phase. The study found out that there was a lack of professional development for teachers in integrating IK into their lessons. Findings further revealed that, knowledge of the pedagogical practice appropriate for teaching IK was

inadequate and there was a lack of political will on the part of the government to assist teachers to incorporate IK into teaching. This was an indication that teachers did not have the appropriate pedagogical skills that will enable them to integrate IK into their teaching in the classroom. Hence, this paper explored how IK is integrated into teaching using Ubuntu values. Researchers believe that integrating Ubuntu IK values into their lessons could assist teachers. Furthermore, according to Waghid, Waghid, and Waghid (2018), an African philosophy centered on Ubuntu is one in which students are given the knowledge and skills necessary to comprehend and make changes of their surroundings by drawing upon the strong concepts found in their surroundings.

Colonial administration's perception of IK is that the concept is primitive and does not follow a scientific procedure in its usage, development, and belief system (Maware, 2015). Little or no effort has been made by the Department of Basic Education and other stakeholders to support teachers in integrating IK into their lessons in the classroom in South African schools (Mavuso et al., 2021; Khupe 2014; Jacobs, 2015). There is the urgent need to step up the campaigns to bring to the limelight the importance of IK and create awareness for learners from grade R to grade 12. To achieve this, there is a need for more research and innovations in the development and preservation of IK in Africa particularly in South Africa to be at par with the developed world. This paper canvasses the need to urgently develop a strategy that will encourage the transfer of IK from one generation to another in a way that will address the socio-economic need of the society and promote innovative thinking and problem-solving strategies in sub-Sahara Africa. Ubuntu as a philosophy could bolster the integration of IK in teaching and learning. Ubuntu is about oneness, fairness, openness, respect, collegiality, compassion, and working in harmony with others and the environment. This connection between the individual and the common good is taken seriously in an Ubuntu curriculum or teaching style, which also makes sure that democratic and epistemic disparities in society are managed. It means that the setting in which a curriculum is implemented matters and that involvement and understanding of a group of people, which also implies managing differences, are more essential than individuality (Quan-Baffour, 2014). This implies that using Ubuntu to integrate IK in teaching and learning could unlock the possibilities of the decolonization of curriculum project in South Africa and elsewhere. An Ubuntu curriculum allows for the possibility of positioning teaching and learning in the South African context and calling for the participation of all as opposed to apartheid forms of education, for example, which denigrated non-whites in the country (Hlatshwayo, & Shawa, 2020).

Handayani et al. (2018) explored the challenges facing the integration of IK into the science curriculum in Indonesia. The study proposed four stages to integrate IK into the science curriculum which includes: fragmented, connected, sequenced, and integrated. The view expressed by Handayami et al., (2018) that indigenous education should be integrated into the science curriculum is crucial to science teaching. This position was also supported by scholars of IK that the best way of strengthening IK is integrating it into the school curriculum so that the learning and exposure of learners will start from their foundation (Regmi & Fleming, 2012; Zinyeka, 2013; Zinyeka et al., 2016). In Africa, it appears that the IKS is still at its

primitive stage in terms of its documentation and development to meet the set standards by advanced countries which is the major criticism against this belief system. This implies that there is need to provide support for teachers to integrate IK into their teaching; and using Ubuntu values could be a solution.

6. The current debate on Indigenous knowledge

Debates on IK have been ongoing all over the world on different topics and Moyo (2011) remarked that, since IK is freely given in a particular culture and another culture, it is being commodified for a private benefit which calls for nation-states to bring in laws that will provide intellectual property in line with the acceptable standard internationally. This position was also canvassed by Stabinsky and Bush (2007) on the need to initiate a control mechanism on the biological resources' accessibility and usage of information on IK for the benefit of the people.

Khupe (2014) expressed concern about the unavailability of resources for teaching IK in the classroom. The study concluded that there is a lack of training and educational resources needed for the integration of IK into the curriculum. Likewise, Moyo (2011) concluded that the integration of IK into the curriculum in South Korea has been left to the discretion of teachers who lack appropriate training on strategies that can be adopted in integrating IK into science teaching in the classroom. The assertion raised by the author is an indication that teachers do not integrate IK into their teaching because they lack appropriate training and resources. The training of teachers on IK should be integrated into the PTDP. The training should also be part of pre-service and in-service training for science teachers and other teachers that teach IK in the classroom. Teaching materials/resources should also be developed by researchers to capture, conserve, and disseminate IK materials by teachers and other stakeholders. There is a need to strengthen PTDP in such a way that Ubuntu values are reflected and unpacked. This will assist in integrating AIKS in a manner that enhances cooperation, problem-solving skills, compassion, empathy, respect, tolerance, humanness, and harmony among learners (Akintola & Uzodike, 2018).

One other argument that teachers are currently facing while integrating IK is the need to change from their indigenous traditional ways to western-based-school-curriculum training. Matike (2012) views this challenge as one that will make teachers adapt to the modern and western school curriculum on teaching and learning IK. The study, however, concludes that the integration of IK into the school curriculum cannot be achieved due to the lack of training of teachers and their attitudes toward teaching IK. This position was also canvassed by Aldous and Rogan (2013) who posit that in South Africa, the introduction of National Curriculum Statements (NCS) and Curriculum Assessment Policy Statements (CAPS) were created without taking into consideration the need to integrate IK in teaching and learning setups. Mushayikwa and Ogunbiyi (2011) had earlier pointed out that shortcomings of policy making regarding the integration of IK into school curriculum affected District Officials apart from the teachers because they were no clear-cut guidelines on the ground to be followed concerning integration of IK into the school curriculum.

Meanwhile, there have also been debates that have been put forward on the role played by universities in research on IK. For instance, Mapara (2017) advances that, universities and higher institutions in South Africa have carried out research studies into the IK but regretted that such research was concentrated on the validation of Western knowledge at the expense of the African indigenous beliefs and practices. Therefore, efforts should be intensified at increasing research scholarship and activities by universities and other research institutions to validate Africa IK. This claim was also validated by Ngulube, Dube, and Mhlongo (2015) in a qualitative research on the inclusion of the Indigenous Knowledge System (IKS) into the higher education curriculum in universities in South Africa. The findings of the study showed that the pedagogical practices that undermine AIK are still dominating the process of seamless integration of IK. This scenario questions the seriousness of universities in focusing on the importance of providing training for teachers on how to teach IK in the classrooms. Universities in South Africa and indeed Africa and other stakeholders should develop an appropriate pre-service program that will assist teachers in pedagogical strategies for teaching IK. The in-service teachers should also be provided with appropriate teacher professional development courses and workshops for effective integration of IK in their lessons. This program will assist towards an effective integration of IK into the curriculum and provide strategies that will guide practicing teachers to teach IK in their lessons.

Handayami et al. (2018) pointed out that indigenous education should be integrated into the science curriculum because it is crucial to science teaching. A number of research studies have also been done that are of the view that the best way of strengthening IK is by integrating it into the school curriculum (Regmi & Fleming, 2012; Zinyeka, 2013; Zinyeka, Onwu & Braun, 2016). In Africa, the indigenous system is still at its primitive stage in terms of its documentation and development to meet the standards set by the advanced countries which is the major criticism against this belief system.

Arguments on the need for PTDP for training of teachers on IK have been ongoing. Literature reveals that the integration of AIKS into school teaching and learning seems to have been left at the mercy of teachers (Moyo, 2011). The teacher training program should be part of pre-service and in-service training for teachers. The teacher training programs to be offered by the Department of Basic Education and other stakeholders should be capable of providing a strategy that teachers can use in teaching IK in their classrooms, this will assist teaching in departing from the indigenous traditional ways of western-based-school-curriculum training (Matike, 2012). The training of teachers is paramount and should be embedded with clear-cut guidelines that will enable teachers to teach IK in an effective was South African schools. Although the training of teachers is mandatory for the integration of IK into the classroom, the attitude of these teachers can also be a hindrance to the successful integration of IK into their teaching in the classroom (Keane, 2015; Mc Night, 2015).

7. Teachers' views on issues of integration of IK into the school curriculum

Different views have been expressed by teachers on the need to integrate IK into the curriculum. A teacher-participant study conducted by Jacob (2015) reveals that teachers require workshops and training on the effective use of materials for teaching IK. The study further suggests that teachers will perform better when they are supported by a continuous teacher development program on IK for serving teachers and pre-service teachers. The training of teachers is very critical since they are the channel through which knowledge is passed to learners. They are required to have a mastery of the content knowledge and pedagogical skills which they can get from the TPDP so that they can deliver their lessons effectively in the classroom.

Keane (2015) pointed out that the attitude of science teachers toward the incorporation of IK into classroom was responsible for the lack of interest by learners. The study entitled "why indigenous knowledge has a place in the school curriculum" reveals that teachers view science as a more powerful knowledge that is superior to IK and shows a negative attitude to its integration into their teaching in the classroom. The study also revealed that teachers are reluctant to teach IK in the classroom because of the learners' cultural diversity of learners. It becomes a problem determining which IK knowledge to teach since learners' cultural background differs. The findings also revealed that science teachers were constrained to teaching IK in their lessons because of the need to cover the syllabus which is already overloaded. In a qualitative case study located in the interpretivism paradigm, McKnight (2015) asserted that South African teachers do not spend quality time teaching IK in schools. The emerging findings by McKnight support views expressed by Keane (2015) concerning inadequate time and the need to cover the syllabus which is infused with IK by teachers.

Accordingly, Kaya and Seleti (2013) expressed the negative attitude of teachers in African schools on the integration of IK into their teaching in the classroom and specifically describe the curriculum as being too academic to address African problems. Respondents in a case study conducted by Muza (2013) expressed different attitudes toward the integration of IK into the curriculum. The study which was conducted to determine the extent of teachers' and learners' attitudes toward the integration of IK into the curriculum observes different reactions from participants for the study. For instance, two of the participating teachers expressed positive reactions and supported the introduction of IK into the curriculum while others were skeptical about it. The science syllabus according to the skeptical teachers is already overloaded and integrating IK into it may be difficult to cover considering the constraint of time. Thus, it may be suggested that these categories of teachers will focus on covering the syllabus rather than integrating IK into their classroom teaching which they termed irrelevant. The other group of teachers supported the integration of traditional medicinal plants into the curriculum according to Khupe (2014) because in their view this would prevent the knowledge from going into extinction. Considering these two arguments, it will be in the interest of Africa to encourage the integration of traditional medicine into the curriculum to develop them in line with the western standard and also from preventing black culture from going into extinction.

It can be deduced that the fear expressed by teachers in the integration of IK into the curriculum can be addressed by appropriate government intervention through the issuance of appropriate directives and supervision. Integration of IK into the curriculum should not only be left alone for the government but other relevant critical stakeholders should also be considered to address the fears and concerns of teachers that are not willing to integrate IK into their teaching due to an overload syllabus.

Although there is no clear strategy for the integration of IK into the curriculum, Handayani et al. (2018) suggested four strategies to integrate IK into the curriculum which includes fragmented, connected, sequenced, and integrated. Fragmented is the stage, in which IK and science were studied separately in an isolated system. Each field of knowledge is regarded as an independent, self-contained, and distinct real thing. The connected stage indicates that knowledge from the fragmented area were explicitly connected based on each subject area, topic, concept, skill and other scheme. Whereas, the sequenced stage involves two knowledge domains which are aligned in the following stage. By linking and correlating the world of indigenous knowledge and the science classroom, this alignment attempted to examine the relationship between the two knowledge fields in greater depth and detail. The aim at this stage is to group the subjects, ideas, chapters, and competencies shared by the two knowledge domains. The school and the local tribe actual become one universe. Lastly, the integrated stage overlaps skill, knowledge, and attitude while determining curricular preferences in each knowledge area were combined in the integrated step. As commonalities arose because of the integration, ideas began to depart from the subject matter content (Handayani, et al., 2018).

8. Using Ubuntu values to Integrate African Indigenous Knowledge into Teaching and Learning

The attitudes of learners toward learning in their surroundings are greatly influenced by their knowledge of the Ubuntu values. These ideals place a strong emphasis on living together in the community where learners are located (Mbeje, 2010). According to Qobo and Nyathi (2016), the Ubuntu ideology portrays collective behavior, a human character founded on spirituality, and the connection or understanding that exists between members of a society. These beliefs have existed since the beginning of time, and the indigenous people see them as vital values and aspirations. However, these principles ought to serve as the cornerstone for instruction, learning, and the integration of AIK into the curriculum in schools (Qobo and Nyathi 2016). The authors go on to say that because Ubuntu values can give instructors/teachers the pedagogy and tactics they need to teach IK in the classroom, it should be a component of pre-service and in-service teacher training programs. Therefore, it would seem from the perspectives of Handayani et al. (2018) and Khupe (2014) that one of the crucial methods for teaching AIK is ingrained in the Ubuntu principles, which teachers have neglected to apply in their instruction in the classroom. Some of the reasons for the neglect may be related to the fact that these techniques were not covered in the programs for pre-service and in-service teacher training for those who teach AIK (Moyo, 2011). However, research has shown that local initiatives, folklore,

and games can help school planners include AIK into the curriculum (Akinola & Uzodike 2018). Since learners develop these abilities, including them in the curriculum will support the teaching and acquisition of AIK in the classroom. Additionally, by including indigenous games and folklore into the teaching of AIK, schools can help learners learn how to be inclusive and work together.

9. Conclusion

Review of related literature has revealed that AIK is not adequately integrated into teaching and learning and that teachers are not using Ubuntu values in the classroom. This is despite the efforts by the government and stakeholders toward the integration of IK into the school curriculum which implies that these efforts have not yielded the desired results. Furthermore, it became clear from the literature that there is no coherent framework to support teachers integrating AIKS into the classroom a situation for which Maware (2014) and Shizha (2013) call for concerted efforts to produce a strategy that will assist teachers to integrate AIKS in the classroom. Maware (2014) and Shizha (2013) reiterated the need to develop the IK since it is indigenous to the people. These authors conclude that research institutions and universities in South Africa should embark on research into IK as a way of developing the culture, beliefs, and local inventions of the indigenous people to compete with their western counterparts. Research into the IK is urgently needed given the way colonial administration tagged African IK as unscientific, illogical, anti-development, and ungodly (Wamare, 2014).

It can also be concluded that little effort has been made to assist teachers to integrate AIKS into teaching and learning let alone embracing Ubuntu as an African philosophy of Education. The study emphasized the need to encourage science teachers to develop a positive attitude toward teaching and learning of AIK in the classroom. it also indicates that strategies for teaching AIK be incorporated into the pre-service and training programs This should also be part of the in-service training program for AIK teachers. Furthermore, a clear strategy to integrate AIKS in teaching still needs to be developed by the department of education and its stakeholders and researchers still have to embark on intensive research scholarship about how AIKS could be integrated into teaching and learning.

10. Recommendations

This study recommends that the Universities, the Department of Basic Education, and other stakeholders should incorporate strategies that will assist the full integration of IK into the curriculum and embrace Ubuntu as a philosophy of education. Also, the study recommends a continuous teacher development program (CTDP) that will boost the skills of teachers along with the pre-service and in-service teacher training program should be implemented by the universities and the Department of Basic Education.

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