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THEORISING THE ITINERANT CURRICULUM AS THE PATHWAY TO RELEVANCE IN AFRICAN HIGHER EDUCATION IN THE ERA OF THE FOURTH INDUSTRUAL REVOLUTION

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ABSTRACT

The current era of the fourth industrial revolution combines digital, physical, and biological knowledge in ways never seen before. This revolution has resulted in disruptive technologies and trends, such as robotics, internet of things (IoT), virtual reality, and artificial intelligence (AI) . The African continent is still behind with preparations for its future, through relevant unique educational practices for its populace in this era. This is because very little has changed in the curriculum content of African education, and post colonial education in Africa is essentially a colonial legacy. The curriculum is still designed after western models and paradigms, which have little or no relevance to life in Africa. This paper records the epistemological evisceration of African-centered intellectual traditions in formal education as a major cause of this challenge. Proposing the introduction of an itinerant curriculum in the African higher education sector as a viable solution to this epistemicide, this paper first argues that all bodies of knowledge(western and indigenous) are valid and significant, and should therefore be infused together without one placed as superior over the other. The study concludes that curriculum should reflect the intrinsic value of African culture, language, customs, and practices. The integration of all bodies of knowledge is the hallmark of an itinerant curriculum, should support the inclusion of a wider diversity of knowledge in curriculum theory, and practice.

Contribution/Originality: This paper documents the epistemological evisceration of African-centered intellectual traditions in formal education as a major cause of Africa lagging behind in the current industrial revolution. This study further proposes the introduction of an itinerant curriculum in the African higher education sector as a viable solution to this epistemicide.

1. INTRODUCTION

The mid nineteenth century recorded a shift from slave trade to the colonization of the African continent. It is a known fact that colonization was a mechanism of exploitation, and education during this era was designed to benefit the colonialists. Colonial schools were established for capital reproduction and accumulation, resulting in a selective type of education. All these were done in a bid to ensure that the educated labour in Africa, consisted largely of low-level functionaries will only promote, and maintain the status quo (Sifuna, 2001). The colonial curriculum placed no premium on areas that would benefit their African subjects, rather, African students were trained to fulfill tasks

appropriate to their presumed intellectual, and social inferiority. This has led Africans to be oblivious to the fact that, they can pursue knowledge that is endogenous to their settings.

In the current era of the fourth industrial revolution which combines digital, physical, and biological knowledge in unprecedented ways, the African continent is still behind. It needs to prepare for its future through unique educational practices for its populace. The colonialists are long gone, but African nations are yet to make significant efforts to change the ethos and values of colonial education. Very little has changed in the philosophy and curriculum content of African education, and according to Moumouni (1968) post-colonial education in Africa is essentially a colonial legacy. Higher education in Africa is still designed after western models and paradigms that have little or no relevance to life in Africa. These models have continued to depersonalize African knowledge, and destroy the epistemological paradigm of the educational curriculum in Africa. This amounts to an epistemicide of African knowledge.

As stated by Bennett (2014) epistemicide is a systematic destruction of any indigenous knowledge base, such that the perpetrator does not believe in fusion or exchange of that knowledge, and completely disregards the victims' knowledge. Fataar and Subreenduth (2016) used the word epistemicide as a "metaphor for the epistemological marginalization, or evisceration of African-centered intellectual traditions in formal education". They argue that this epistemicide results from "constant hegemonic western science model of knowledge construction, production and consumption that un-problematically circulates within education discourse and practice on the African continent as relevant, valuable and best practice". Moreover, the educational and curriculum practices of the colonial masters were devoid of the cultural epistemologies of the African people. In response to this, several scholars called for different solutions to ensure the relevance of the curriculum used in higher education institutions in Africa. Some of which are deconstruction of the academic curriculum (Higgs, 2002),standardization in African higher education (Woldegiorgis, 2013), decolonization of the curriculum (Padayachee, Matimolane, & Ganas, 2018; Woolman, 2001), and the adoption of an open curriculum (Kehdinga, 2019).

Drawing from the works of Santos (2008): Paraskeva (2011) opines that the knowledge of western scholars has dominated the formations of curriculum all over the world, and this has marginalized other forms of knowledge that do not fit in the western traditions. He proposes an itinerant curriculum theory to fight against epistemicide. As stated in the Cambridge dictionary, the word itinerant means travelling from one place to another. This implies that an itinerant curriculum is one that journeys from one destination to another, uncertain, and unpredictable. This is because in one destination, it takes one pattern, but as it journeys to another, it takes another pattern peculiar to its location. Within the context of this study, it stands for a curriculum on a journey from the western world, to the continent of Africa. Paul Wangoola, a Ugandan intellectual travelled around the world for 25 years, gaining knowledge and experience. He returned to his home in Busoga Uganda with these words;

> You sent me out... to gain western knowledge and to work in the structures and organizations of the western world... i have come to tell you that we, the children of Busoga kingdom, the children of Africa will never realize our full potential as people in our communities and as contributors to the global treasury of knowledge if we continue to depend wholly on the content and ways of knowledge of the European people. Our way forward must be linked to the recovery, replenishment and revitalization of our thousand of years old indigenous knowledge. (Wangoola, 2002).

This paper therefore attempts to theorize that, the introduction of an itinerant curriculum in the African higher education sector will ensure its relevance in the present era of industry 4.0. The paper is divided into two sections, the first section provides a vivid discussion on related literature as it concerns the conceptualization of an itinerant curriculum, and the fourth industrial revolution. It further outlines factors affecting the relevance of higher education in Africa, and discusses the 'Africanization' of the curriculum, while proposing the adoption of an itinerant curriculum as a pathway to relevance. The second section proposes the 'internationalization' of the higher education curriculum, as the way forward for education in Africa in this era of the fourth industrial revolution.

2. LITERATURE REVIEW

The fourth industrial revolution, usually called industry 4.0 or 4IR, can simply be referred to as the current, and developing environmental transformation in the way humans function, which is a result of disruptive technologies, and trends such as robotics, internet of things(IoT), virtual reality and artificial intelligence(AI) (Rouse, 2017). According to Adam (2018) the implications of industry 4.0 for education are twofold. The first requires research and interventions from scholars and scientists, or making AI not just an industrial tool for production but also useful in direct service to society. The second implication deals with teaching and learning process, with focus on curricula. He argues that the curriculum should be decolonized, so that there will be a fusion of AI in all fields of study, and across all 'bodies of knowledge'. All bodies of knowledge implies that diverse knowledge systems should be infused together, without one placed as superior over the other, or completely disregarded and silenced.

This integration of all bodies of knowledge is the hallmark of an itinerant curriculum. This is because it supports the inclusion of a wider diversity of knowledge in curriculum theory, and practice. For Africa, the phrase 'all bodies of knowledge' is a pointer to the utilization of indigenous knowledge systems. As opined by Paraskeva (2011) Africa needs to fight against the colonialism of knowledge, in order to build a curriculum that is democratic, socially just, and culturally relevant. Scientific findings are valid no matter who discovers them, but such findings can be taught in a way that integrates with indigenous education, rather than trying to override it and amounting to epistemicide. An itinerant curriculum is one that travels through the other side of epistemic abyss, supporting the inclusion of a wider diversity of knowledge in curriculum theory and practice (Paraskeva, 2011). This curriculum is a tool that will fight against epistemicide, by pushing for a different research platform, challenging modern western thinking which is abyssal thinking, in which the knowledge of the other is produced as non-existent. Therefore, the question that needs to be answered is, how exactly can an itinerant curriculum if adopted by African higher education institutions, prepare its scholars to become relevant in the current era of the fourth industrial revolution?

2.1. Restoration Precedes Integration

Paraskeva (2011) claims that itinerant curriculum facilitates the integration, and internationalization of curriculum, provided a few conditions are met. First, the restoration of African knowledge in the curriculum must precede this integration. The African higher education curriculum therefore needs to be Africanized. This implies reconstructing the curriculum to include the body of knowledge, embedded in African philosophical thinking and social practices, which has evolved over thousands of years. According to Kaya and Seleti (2014) African indigenous literary and philosophical traditions are viewed as primitive and unscientific, and therefore are not appropriate sources for social theory, and research development. African scientists have also been unable to generate indigenous concepts, definitions, theories, and methods to guide intellectual development. Actually, abyssal epistemology creates a deep rooted and normalized epistemological enclosure, which prevents the emergence of critical African knowledge to circulate in any substantive way, within the dominant knowledge system. Moreover, education and research in higher education institutions systematically dismisses the intrinsic value of African culture, language, customs, and practices from the curriculum. This implies that the higher education system in Africa is distant from the developmental challenges of African local communities.

Odora Hoppers (2001) argues that:

> *Subject contents are dumped onto children without any efforts to ensure that they first understand the subject in relation to their lived reality, a reality in which what is to be acquired via the school may only be a small part... all the disciplines crucial to national development such as science, law, sociology and political science are not anchored in, or linked in any culture but the western one. Where Africa culture is brought up (often in passing), it is presented as devoid of any epistemological content. This produces cognitive injustice.*

As defined by Van der Velden (2004) cognitive justice is a "normative principle for the equal treatment of all forms of knowledge". This implies that different forms of knowledge have the right to survive creatively and sustainably, even if they are not equal. Cognitive justice is also about recognizing the right of different forms of knowledge to coexist, seeing that all knowledge is partial, and complimentary (Visvanathan, 2009). As stated by Paraskeva (2011) on his notion of an itinerant curriculum theory, there can be no global justice without global cognitive justice. Curriculum in higher education institutions in Africa should therefore be firmly anchored in the cultural and intellectual environment of the community in which it is located. This curriculum should be infused with the wealth of knowledge that emanates from local communities, and appropriate such knowledge towards human centered development. This will provide Africans with an education that adheres to their own inherent perspectives, experiences, languages, and customs.

Fataar and Subreenduth (2016) insists that curriculum and text resources, need to push students beyond their own "realities and experiences by providing multiple perspectives and alternative theoretical frameworks from which to re/read their lived experiences, experiences of the past, what is presented as common sense realities, and the dominant Eurocentric and canonical forms of knowledge." This implies that a curriculum constructed on the basis of indigenous African knowledge systems, empowers educators and learners to gain confidence in their own capabilities, and to acquire a sense of pride in their own ways of being in the world. To become itinerant and stay relevant, African scholars need to think critically, communicate effectively, collaborate with diverse peers, solve complex problems, and adopt a global mindset. Reconstructing the higher education curriculum to include indigenous African knowledge will help construct new development knowledge, which will be African-centered, and will equally be valid in solving local and global problems more effectively (Van Wyk & Higgs, 2012). Besides, it will provide African learners education that adheres to their inherent perspectives, experiences, language, and customs.

The realization of the recognition of indigenous knowledge systems would be incomplete if indigenous languages continue to be marginalized, and devalued, as it was during the colonial era. Asian nations are in the forefront of industry 4.0, and this feat has been achieved partly because their educational development strategies are based on their indigenous languages. The Asian strategy targets the whole Asian population, and not a few elites, in their strides to develop themselves, and advance technologically within their cultural framework. China for example has made Mandarin a language of educational verisimilitude (Kehdinga, 2019). Language is not just a method of human communication amongst certain people; language is also a carrier of culture, values, dreams, and the aspirations of these people.

Most higher education institutions in Africa use English language as their medium of instruction and this has led to the further collapse of indigenous languages. Rather than attempting to translate the European curriculum into African languages, higher education institutions in Africa have included authentic oral texts from each local tradition. The curriculum now needs to be interrogated in terms of relevance, and appropriateness for knowledge, embedded in indigenous technologies, and cultural practices. Seepe (2000) writes that, "Starting with indigenous knowledge systems would encourage learners to draw on their cultural practices and daily experiences as they negotiate and grapple with new and unfamiliar terrain." When epistemicide is conquered, the internationalization of the higher education curriculum will become possible. This is because the curriculum will involve more than the insertion of content about Africa, it will also include an acknowledgement of the different ways of knowing the world.

2.2. Integrating Western and Indigenous Knowledge Systems

African indigenous knowledge and education systems have existed for thousands of years long before the colonialists introduced western education. This education system was a process of passing among the tribal members, and from one generation to another, the inherited knowledge, skills, cultural traditions, norms, and values (Mushi, 2009). As stated by Owuor (2007) where formal education has made insignificant impact, indigenous

education has been a valuable means of transmitting knowledge, and skills. This is because it integrates character building, intellectual training, manual activities, and physical education. African learners have since been faced with the conflicting demands of amalgamating the new education with their indigenous knowledge, especially since they have been groomed to believe their education is inferior (Abah, Mashebe, and Denuga, 2015).

Different scholars have continued to argue that education cannot exclude cultural knowledge, and as such, indigenous knowledge should be integrated into formal education, as it has the potential value of solving contemporary problems. Popp (2018) recounts that the active ingredient in the pain reliever called Aspirin (Acetylsalicylic acid), was first discovered by indigenous people, who utilized the bark of the willow tree. Some pharmaceutical companies use indigenous knowledge to identify medicinal plants, extract the active ingredients, and exploit them commercially. Kaya and Seleti (2014) insist that the integration of African indigenous systems, can improve the relevance of higher education in local and global setting. How then can integration be successful especially in the field of science and technology, as these are the areas of focus in the era of fourth industrial revolution? This question prompts Popp (2018) to submit that:

> *Science is the pursuit of knowledge. Approaches to gathering that knowledge are culturally relative. Indigenous science incorporates traditional knowledge and indigenous perspectives, while non-indigenous scientific approaches are commonly recognized as western science. Together, they contribute substantially to modern science.*

These comments indicate that instead of keeping the dominant conventional approach, it is of great importance to integrate indigenous knowledge systems with science and technology curricula. This is because they each have significant roles to play in the process of teaching, and learning sciences. A comparative study by Gumbo and Williams (2012) reveals that technological, and science lessons in African institutions of learning, are devoid of indigenous contributions. Too much emphasis is laid on teaching western technological and science knowledge, rather than balancing it with indigenous technological and scientific knowledge. Aikenhead (1996) opines that science does exist within a socio-cultural world, and the curricula should pay attention to the cultural issues regarding knowledge. This implies that recognizing culture in scientific education does not pose a threat to logic; it gives a broader view of relationship that exists between science, and the socio-cultural world.

In Canada, Alaska, and New Zealand, indigenous knowledge has been successfully integrated with formal school science, and this success has been recorded. Their approach entails teaching school science in such a way that it gets consistent with the student's community values, and by extension with their socio-cultural world. Indigenous knowledge and identities are not discredited; rather they are reinforced (Aikenhead., 2001; Kawagley, Norris-Tull, & Norris-Tull, 1998; McKinley, 2005). This mode of science education helps students to be cross-cultural, nurture, and expand their identities, helping them to prepare for proficient living in both indigenous and scientific worlds. Integration of African indigenous knowledge and western knowledge in the curriculum will therefore create an environment, which will enable the participation of other knowledge systems, promote immersion in the local knowledge system, and ensure that these values and methods are legitimately placed in the curriculum.

Both western knowledge and indigenous knowledge in science and technology have their advantages, and drawbacks, but can also complement each other. According to Cheek (1992) indigenous technology is a body of knowledge developed by culture, that provides methods or means to control the environment, extract resources, produce goods and services, and improve the quality of life. Indigenous technology has evolved from the traditional and cultural milieu of a people; therefore, the use of the term 'local' to qualify indigenous technology should not affect the value of the technological innovation. It should instead be a pointer to the fact that the use and application of that knowledge, was created for a particular locality, and therefore is still in its formative stages of development. The focus of African higher education institutions should therefore be to cultivate innovative talents, who should be

trained in an interdisciplinary environment, so that they can be flexible and adapt to the changing world. Curriculum developers and teachers also need to understand and commit to the value of an integrated approach.

3. THE RELEVANCE OF AN ITINERANT CURRICULUM: FINDINGS AND DISCUSSION

According to Paraskeva (2011) an itinerant curriculum challenges one of the fundamental characteristics of abyssal thinking, which is the "impossibility of co-presence of two sides of a line". In the context of this study, on one side of the line is African centered knowledge, and on the other, is the knowledge of the western world. An itinerant curriculum which is a curriculum of non-places and non-times but, is in essence, a curriculum of all places and all times (Paraskeva, 2011). This implies that an itinerant curriculum is an internationalized curriculum, i.e., a global curriculum with the infusion of knowledge from all spheres. The internationalization of the higher education curriculum amounts to making the curriculum global, such that it is constructed to integrate intercultural knowledge, in order to serve a global purpose.

The global education system is now focused on producing scholars, who can become strong team players in the society, by contextualizing knowledge with social, economic, and cultural settings. This is due to the transformation of all societal domains by industry 4.0, in such a manner that scholars with scarce knowledge or basic skills required to implement, manage, and work alongside new technology will become irrelevant. This era will see employers in search of scholars with creativity, leadership and entrepreneurial skills; those with life long learning skills, and the ability to work in interdisciplinary teams, and who can incorporate interdisciplinary knowledge in their work (Adam, 2018).

As stated by Xing and Marwala (2017) the fourth industrial revolution is driven by artificial intelligence and cyber physical systems. It is an era that is shifting global focus to technological and scientific trends, which will directly affect higher education institutions in all nations. It will require the creation of a single platform, which would give higher education institutions a common framework (Kehdinga, 2019). Mobile internet, automation of knowledge work, internet of things(IoT), cloud, advanced robotics, autonomous vehicles, genomics, energy storage, 3D printing, advanced materials, advanced oil and gas exploration, and renewable energy are twelve disruptive technologies that will reshape the world in this era (Fisk, 2017). Most importantly, the fourth industrial revolution will continue to shrink the world in order to promote global connectivity; therefore, only such scholars who can work across cultures and disciplines will be poised to take advantage of the available opportunities. As opined by Penprase (2018) substantive changes need to be made to the current curriculum utilized by African higher education institutions because;

> The curriculum needs to help students develop the capacity for ethical reasoning, for awareness of societal and human impacts and to be able to comprehend the impacts of industry 4.0 technologies on people, so that they are trained to not only increase our material prosperity but also to improve our social and cultural fabric. Penprase (2018)

Furthermore, an itinerant curriculum will promote a global mind-set, giving scholars the edge to be fully grounded for the future workplace, and the ability to handle global situations regardless of location. This curriculum is more relevant because of its transferability, which enables a smooth transition from one country to the next. An itinerant curriculum will see teaching and learning, handled in an international context. History will no longer be taught from the perspective of one country or continent, but will be taught using examples of different historical themes from across the world. This will develop the mind-set of scholars, to acknowledge many different cultures obtainable across the globe today (Carruthers, 2018). This is an important factor for Africa because, the lack of integration of educational goals with the cultural context and African values, has contributed to the crisis in the African educational system. An itinerant curriculum for Africa will help scholars imbibe indigenous knowledge, practices, values, and where necessary, adopt and adapt global best practices to local settings. African higher

education institutions will then forge domestic and international institutional linkages, to offer versatile education programs, placing both evolutionary and revolutionary innovation high on its agenda.

Although the focus of the fourth industrial revolution is on science, technology, engineering, and mathematics(STEM) education, Kehdinga (2019b) argues that, teaching and learning during this era should not be just about knowledge and technological skills. It should also involve training Africans to develop enquiring mind-sets and attitudes, as it is essential for the dynamic and flexible emerging world. The rationale for the internationalization of the curriculum is associated with preparing scholars to live, and work locally in a globalized world. This implies that there are other skills required to make this possible. These are skills in complex problem solving, critical thinking, creativity, people management, coordination with others, emotional intelligence, judgment and decision making, service orientation, negotiation, and cognitive flexibility amongst others (Kehdinga, 2019b). These are skills that will prepare African scholars for the highly interdependent and multicultural world in which they live, and will have to function in future. Scholars, who are capable of creative insights, collaborating in diverse teams, and navigating through global cultural differences, will be an advantage in the era of industry 4.0.

Managing multiple disciplinary and cultural perspectives, over static swathes of disciplinary content, will be another benefit of itinerant curriculum. This implies that it will have a global perspective, since it is developed by internationally minded scholars who recognize a common humanity. As stated in the Program for International Students Assessment (PISA), the Organization for Economic Cooperation and Development (OECD) has outlined four key traits that students in the era of industry 4.0 should imbibe, in order to succeed in the global economy, and multicultural societies. First, they must be able to investigate the world beyond their immediate environment by examining issues of local, global, and cultural significance. Second, they should recognize, understand, and appreciate the perspectives and worldviews of others. Third, they should communicate ideas effectively with diverse audiences, by engaging in open, appropriate, and effective interactions across cultures. Lastly, they should take action for collective wellbeing and sustainable development, locally and globally (PISA, 2018).

4. CONCLUSION

The premise of this study was to make a case for the integration of indigenous knowledge, into the higher education curricula utilized by African institutions. This should be done as opposed to the usual practice of adopting western models and paradigms, which has little or no relevance to life in Africa. This is the bane of an itinerant curriculum, which supports the inclusion of a wider diversity of knowledge in curriculum theory, and practice. As stated by Paraskeva (2011) "western epistemological views need to pay attention and learn from other non western epistemological views in and beyond the west". Indigenous and Western knowledge frames should not be pitted opposite, as traditional versus modern. Rather, both forms of knowledge should remain in harmony. This fusion of knowledge is even more important with the emergence of the fourth industrial revolution, which has created euphoria for market driven economies, and technological development. Issues such as cross cultural transfer of knowledge, globalized curricula integration, and appropriate teaching-learning strategies have become critically important for consideration.

Industry 4.0 is transforming the world greatly, and certain skills that are not peculiar to any body of knowledge have become important. Students in different cultures learn differently, and the best approaches for teaching them to think creatively should be pursued. The focus is currently seen on developing scholars with an entrepreneurial spirit, who have the ability to reconcile the cultural adherence, with reverence toward authority and the need for risk-taking creativity. According to the WEF (2017) there will be a demand for professionals who can blend digital and STEM skills, with traditional subject enterprise. An African higher educational curriculum needs to be structured to encourage cognitive flexibility and emotional intelligence, as these are the skills vital for the future. The ability and resilience to jump into different skill-based opportunities requires cognitive flexibility, and such flexibility does not come from the sort of curriculum currently in place. The curriculum must be culturally

attuned creating adaptive and flexible minds, as these are the demands of the projected fast-paced future. The relevance of African scholars in these changing times is a function of their ability to utilize both indigenous and western bodies of knowledge for creative thinking, and problem solving in a multicultural globalized world.

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