Towards achieving Innovation through mainstreaming Sustainable Development Goal 4 on Quality Higher Education the Southern African Perspective

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Abstract: **The purpose of this article is to establish the challenges of achieving Sustainable Development Goal 4 (SDG4) on Quality education and education for sustainable development, focusing on four universities in the Southern African SADC region. The study draws on the critical realist theory of structure, culture and agency theoretical view point to understand the implementation of sustainable development goal 4 on quality higher education. Specifically, it examines the structural, cultural and agential conditions in higher education that constrain or enable the achievement of quality higher education. This study is conducted using a qualitative research approach with an interpretive epistemological and constructivist ontological perspective. The research findings are analysed through thick descriptions and the element of voice in the text. The interpretive paradigm enabled the researchers to see, hear and understand the particular meaning making inherent in peoples' lives within their institutions. This paper has practical implications for higher education institutions seeking to achieve quality teaching and learning for sustainable development and lifelong learning. Its findings show that higher education curriculum and pedagogy need to be reoriented to address issues of quality and lifelong learning. Our study is one of the studies in Africa to examine issues of lifelong learning, quality and education for sustainable development specifically in the Southern African Region and context of higher education. It is one of the first studies to explore the provision of higher education and addressing key targets of sustainable development goal 4 and its targets to be achieved by 2030. The study forms part of the broader theoretical and methodological debate on the use and application of the realist theory in Education for Sustainable Development (ESD)**

Key words**: Education for Sustainable Development: Higher Education: Quality Education: Teaching and Learning: Southern African region.**

I. INTRODUCTION

Higher Education the world over provides itself as the vanguard of vision and wisdom and its core values point to its potential leadership role in shaping society. Very recently (UNESCO,2017) tell us that, ESD is placed at the centre of the 2030 sustainable development agenda and has been widely acknowledged as a key enabler of all 17 SDGs which includes SDG4 on Quality Education for All. Mohanty and Dash (2018) argue that, sustainable education especially quality education has been considered as renewable resources to be geared towards the acquisition of key competences of 21st century including sustainable life style, work and habitant. According to the United Nations Educational, Scientific and Cultural Organisation (UNESCO), ESD is education that allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future (UNESCO, 2014). It requires participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action for sustainable development. ESD consequently promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way (UNESCO, 2014). The Decade of Education for Sustainable Development (DESD) and the beginning of the United Nations (UN) on ESD, many countries are poised to begin scaling up ESD efforts (UNESCO, 2014). The UN sponsored initiatives have strengthened and focussed global efforts to raise awareness towards moving in the direction to provide capacity building and experimentation linked towards implementing good practises. As ESD is required for re-enabling changes, in the way teaching is delivered, UNESCO sponsored the UN DESD from 2005-2014, to create greater momentum worldwide to bring the collective weight of educational resources to bear on the delivery of education and learning that lead to a more sustainable life in future. Because of their intellectual capacity and hence their role in the knowledge generation in society, universities are considered to be key actors in implementing and achieving a sustainable future. If they are to respond to this challenge they need radical institutional innovation that involves thinking (agency) internal organisational (structures) and operations or systems as well as interaction (cultures) with other social players beyond academia. To achieve a holistic and consistent sustainable-oriented higher education system in the SADC region, the "greening" of higher education should be undertaken over relatively wide area of university life (Boereen, 2019).

In spite of widespread implementation of ESD in the SADC region, there are challenges arising in the specific sustainability and achieving goal 4. Agenda 2030 global goals brought education and sustainability together with world stage nominating targets and objectives which are designed to empower education systems and agents of change in the campaign against poor quality higher education. Agenda 2030 seeks to transform the world focussing on orienting higher education towards sustainable development with a strong suggestion to review curriculum and improve the quality of education. With the adoption of the UN SDGs issues of ESD are now undoubtedly at the top of the global agenda. The UN sustainable development Goal 4, target 4.7 proposes that ESD should be included at all levels of education and the aim is to improve the quality of education. The main challenge is however, little guidance or strategies to improve quality, sustainability and development in higher education demands more than simply a technical policy transfer but it requires attention to issues of structure, culture and agency which constrain the achievement of quick fix of the higher education system. The study therefore explores the specific targets within the fourth UN SDG4 on quality higher education from structure, culture, agency perspectives. Our aim is to explore the complexity of achieving SDGs, specifically focussing on goal 4.The study draws on structure, culture and agency theoretical view point (Giddens, 1984: Bourdieu, 1984, Bhasker, 2011, 2010; Bhasker, Danemark & Price, 2018) to offer deeper understanding and insight into the roles that individuals, institutions, culture and stakeholders may play in achieving ESD and specifically Goal 4 in the SADC higher education contexts.

Our article opens with a brief overview of the UN SDGs, contextualising ESD, followed by a brief review of literature on ESD and a detailed discussion is provided to map insights from structure, culture and agency approaches into the achievement of quality in higher education. This is followed by a brief research method and the study research questions. The article concludes with the findings of the study and recommendations.

II. LITERATURE REVIEW

Education is not only a fundamental human right, but also an indispensable tool in the pursuit of sustainable development. Thus every goal in the agenda 2030 requires education to empower people (Boereen, 2019) with knowledge, skills and values to live in dignity, building their lives and contributing to their society. Mohanty and Dash, (2018) tell us that, in 21st century the UN decade of ESD significantly highlighted the vital role of higher education that it can and must play in the universal journey towards sustainable development across the globe. In September 2015 the UN (Boereen 2019) formally adopted the 17 SDG as an outcome of a major global consultative process. The World Education Forum (2016) under the UN principles advocates for providing the opportunity to progress towards implementing universal quality in education that fosters the knowledge, skills, perspectives, values and actions that lead towards more sustainable future. The SDG4 recommends for quality education for all which has deep roots in many international declarations which highlighted and strengthened the role of education in achieving SDGs. These declarations also recognised quality education as a key enabler to achieve SDG4 on quality education. SDG4 recommends for quality education for all which has deep roots in many international declarations such as, Universal Declaration of Human Rights, Convention of Right of the Child, World Declaration on Education for All, Dakar Framework for Action, Millennium Development Goals, all considering quality education as crucial for the well-being of individual nations and the world (Ozig, 2017; WEF, 2016; Madsen, 2013; UNESCO, 2017a). The sustainable development goal 4 on education for 2030 targets to, ensure inclusive and equitable quality education and promote lifelong learning opportunities for all based on four areas:

- Expanded access to quality learning for all across the various levels of education.
- Attention to the quality of education including content, relevance and learning outcomes across the disciplines.
- Greater focus on quality for access and resources of education.
- Gender equality across all levels of education with safe and supportive learning environments. (Boereen, 2019; Mogren and Gerick, 2017a: Branden, 2015: Madseen, 2013; Leicht, Heiss & Byun, 2018). Boereen, (2019) went on to tell us that the UN SDGs are not the first set of goals designed to create a cleaner planet and more just global society. The previous agenda's Millennium Development Goals (MDGs) were formulated in 2000 and included eight goals to be achieved by 2015.The January 2016 Incheon Declaration with an ambitious new plan which increased the number of goals from eight to seventeen with goal 4 seeking to ensure quality education for all. SDG 4 has been broken down to ten targets (Palmer,2015). The reason for breaking the targets down into perspectives is to increase knowledge of underlying action that might help in reaching the targets (Palmer, 2015). ESD addresses target goal 4 of the SDGs ensuring inclusive and equitable quality education and promoting lifelong learning for all. It addresses target 4.7 of SDG which requires all nations to:

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of the culture of peace and non-violent, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development (Boereen,2019: WEF,2016; Panetta & Williams, 2018).

Agenda 2030 with its global goals brought education and sustainability together with the world stage nominating targets and objectives which were designed to empower education systems as agents of change in the campaign against poor quality education. Agenda 2030 seeks to transform the world focussing on orienting higher education towards (Wals, Mochizuki, & Leicht, 2017) sustainable development with a strong suggestion to review curriculum, instruction and content to ensure multidisciplinary approach.

With the adoption of the United Nations' SDGs in 2015, sustainable development is now undoubtedly at the very top of the global agenda. ESD is generally regarded as a particularly promising approach and is formally included in the SDGs as part of target 4; 7 of SDG4 on education. (Ozig, 2012). ESD is referred to in other SDGs and it can safely be argued that ESD cuts across the all 17 SDGs and can indeed be seen (UNESCO, 2017) as a key instrument to achieve the SDGs.

ESD is generally understood as an education which; Empowers learners to take informed decision and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity (Boereen, 2019:Gabay, 2015). It is about lifelong learning, and is an integral part of quality education. ESD is holistic and transformational education which addresses learning content and outcome, pedagogy and learning environment. ESD achieves its purpose by transforming society (UNESCO, 2014a; WEF, 2016; UNESCO, 2016; Walls & Benavot, 2017).

Sustainable development is a process that meets the needs of the present without compromising (Green & Sommerville, 2015) the ability of future generations to meet their own needs. It is a paradigm for thinking about our future in which environmental, societal and economic considerations are balanced in the pursuit of improved quality life and development. Darsh and Mohanty (2018) argue that we need to update our curriculum, pedagogy and educational resources to address 21st century challenges. It is however observed that in the SADC context of higher education, universities are often compared to big oil tanks, due to their sizes, slow pace of travel, and inability to turn quickly (UNESCO, 2013). The image is applied with negative connotations around the difficulty of changing or diverting these large impenetrable vessels. The key drivers of education for sustainable development would lead to the following three fundamental conditions:

- How much learning the students are actually experiencing?
- What information and skills do they need to succeed in future?
- How can these gains be expanded for progressive and sustainable planets? (Posthumus, 2013)

The concept of ESD and sustainability has been promoted to address global, social, economic and environmental challenges, including persistent patterns of absolute poverty and various forms of social and economic inequality (UNESCO, 2005; 2007; 2009; 2012a; 2013; 2014a;). Considering education as a key driver for SDGs, many international conferences were organised with the aim of bringing together global experience and expertise to highlight and strengthen the role of education in realising SDGs, creating an opportunity to build upon learning from UN DESD and recognising education as a key enabler. (Boereen, 2019). The declaration of UN DESD quickened and fast tracked the pace towards achievement of ESD concerns relating to achievement of ESD. The DESD declared by UN General Assembly at the 57th session on 20 December 2002, offers an important vehicle for promoting ESD within all areas of learning (Tilbury, 2006). ESD provides a significant platform to enhance the profile of education for sustainable development in higher education learning spaces and ultimately to assist in transforming our future into a more sustainable one (Ozig,2012). Recognising that higher education is vital in the transition to sustainability the DESD vision is one in which everyone has the opportunity to benefit from quality education and learning that motivates societal change towards a sustainable future (UNESCO, 2004). In the Southern African region as in other countries, much has been written about the need for the higher education sector to contribute towards development of more sustainable societies, (Ozig, 2012; Gabay, 2015). New challenges to learning are emerging and 21st century higher education should seek to address these challenges and contribute to greater humanity in a greater changing world. (UNESCO, 2015). In this article we argue that, in the Southern African context, there is need to update higher education curriculum, pedagogy and educational resources to address the 21st century challenges.

Recognising that quality higher education is vital in the transition to sustainability, the DESD vision is one in which everyone has the opportunity to benefit from quality education and learning that motivates social change towards a sustainable future(UNESCO,2005). As a global initiative, ESD seeks to reach and motivate persons from all generations and among all sectors to get involved in the effort to develop a sustainable future (UNESCO, 2007).

According to (UNESCO, 2005) the global vision is underpinned by the following objectives:

- To facilitate networking, linkages, exchange and intervention among stakeholders in ESD.
- To foster an increased quality of teaching and learning in ESD.
- To help countries make progress towards attaining the MDGs through ESD efforts.
- Promote countries with new opportunities to incorporate ESD into education reform efforts.

The UN International Implementation Scheme for the Decade (Tilbury,2006;UNESCO, 2004) calls for the development of relevant and sustainable implementation with indicators of ESD at all levels in education. Thus, higher education institutions play a pivotal role in the

endeavour to provide for quality and sustainable education to create a more sustainable society.

In this article, we argue that Africa as a whole is facing critical environmental, social and economic challenges which require new ways of thinking and acting to solve these multiple challenges. There is need to establish policies and prepare learners by educating them in the basics of sustainable development and preparing them to take their places as environmentally, socially and economically literate citizens, consumers, workers and leaders (Boereen, 2019). The UN DESD proposed by the Japanese Government at the World Summit on Sustainable Development held in South Africa Johannesburg in 2002 and at the 52nd UN General Assembly of the same year, began with the proposal to adopt teaching and learning strategies that would promote ESD but up to date SADC countries have not reached the halfway mark due to challenges emanating from institutional and agential conditions. Currently the SADC region is facing the most important challenge of figuring out how universities that are at different levels and stages of development can be able to implement ESD and ensuring that it is successful. SADC universities need to engage in the construction of a global vision and pathway for sustainable development which is a crucial undertaking.

According to (UNESCO, 2005) there are seven essential characteristics of ESD which are:

- Interdisciplinary and holistic learning for sustainable development embedded in the whole curriculum not a separate subject.
- Value driven: It is critical that the assumed norms-the shared values and principles underpinning sustainable development are made explicit so that can be examined, debated, tested and applied.
- Critical thinking and problem solving: leading to confidence in addressing the demands and challenges of sustainable development.
- Multi methods: word, art, drama, debate, experience and different pedagogies which model the process. Teaching that is geared simply to passing on knowledge should be recast into an approach in which teachers and learners work together to acquire knowledge and play a role in shaping the environment of their educational institutions.
- Participatory decision-making: learners participate in decisions on how they are to learn.
- Applicability: the learning experiences offered are integrated in day to day personal and professional life.
- Locally relevant: addressing local as well as global issues, and using the language(s) which learners most commonly use. Concepts of sustainable development must be carefully expressed in other languages. Languages and cultures say things differently, and each language has creative ways of expressing new concepts (UNESCO,2005;17)

The whole school,(Hargreaves, 2008) approach encourages individuals including students, teachers and all other staff to be aware of the issues of sustainability and actively practice ESD in order for the school to integrate ESD into the entire institution. There are two main pedagogical interpretations of ESD: the ESD as a means to transfer appropriate sets of knowledge, attitudes and values to the learner and the second one is to equip people with the needed capacity to make conscious, pro-sustainability choices in their daily lives, to collectively explore the issues to transform the mind-sets and lifestyles through collective discourse (Madsen, 2013; Litz-Sisitka, Halls, Kronlid and Mcgarry, 2015).

From our literature review we can conclude that, if we want to achieve sustainable development especially SDG4 we have to adopt ESD as a process and mechanism for our higher education system robust, progressive and sustainable. An education system that promotes the awareness of the complexities, diversities and ESD strategies can be considered as reflective in relation to social learning and new social movements. In order to bring about reform and achieve ESD in the SADC higher education system, there is need to improve the basic unit of the education system that encompass the human efforts and material equipment together with the infrastructure which could effectively improve students' learning and lectures' performance and institutional culture. Mohanty & Dash, (2018) tell us that, the recent ESD literature on SDGs for 2030 advocates for whole institutional approach to bring sustainable change in the institutions' vision, activities and structures, professional knowledge creation and pedagogical practices. The primary purpose of adopting ESD is to build up an institutional culture that would improve learning and help students to become responsible individuals by fostering sustainability for the sake of conservation of natural resources and promote equality, sustainable consumption, life-style and practices to protect the environment and make our world a place of sustainable habitant. We therefore need to update our curriculum, pedagogy and educational resources to address 21st century challenges. Mohanty & Dash, (2018) argue that, the key drivers to sustainable development would be able to answer three fundamental questions:

- How much learning the students are actually experiencing in schools?
- What information and skills shall they need to succeed in future?
- How can the gains be expanded for progressive and sustainable planet?

To achieve sustainable development goals there is critical need for universal higher education quality and visionary education.

Theoretical Framework: Culture, Structure and Agency

The theoretical viewpoint of the study resonates with the thoughts of Archer, (1995, 1998, 2003: Bhasker, 1979, 1989,1998, 2010 & 2011) social realist theory of structure, culture and agency to analyse the challenges of achieving SDGs specifically focussing on quality in higher education. Structures are said to be the objective complexities of social institutions within which people live and act. Agents are said to be human deliberators and those who navigate their life plans in an environment of constraints. If structures and agents are considered to be ontologically distinct levels, then we have a series of challenges to respond to. Our article draws on structure, culture and agency approaches (see e.g. Giddens, 1984: Bourdieu, 1984) to offer deeper insights into the roles that individuals (agency) and stakeholders play in achieving education for sustainable development. The concept of structure and agency is interested in the structure of social reality and the extent to which individuals are free to act within that structure. Critical realist theory accepts that there exists a reality independent (Bourdieu, 1984) of people's representation of it, and acknowledges that, their knowledge of reality is subject to all kinds of historical and other influences.

The social realist theory according to (Giddens, 1984) comprises three milieus of structure, culture and agency which are superimposed on each other to either constrain or enable the actions of the agent. Structure comprises roles, institutional structures, organisations, committees, substructures, positional levels, systems and policies within an organisation. Archer (2003) tells us that structures also include material conditions which motivate action. Structures are the objective complexes of social institution within which people live and act. Culture mainly focuses on the way of life of people in an organisation do and occupy different institutional structures. It encompasses behaviour, beliefs, values, customs, relationships and special symbols. Agency refers to the personal and individuals, their roles, it relates to the capacity of individuals to act in a voluntary way (Archer, 2003). Agency is the active element of culture. Agency play their roles within the structures. In this study we argue that there are structural, cultural and agential properties that play a role of enablers or constrainers in achieving institutional goals and individuals are free to act within their structure. Archer's (1995) framework offers insight that can lead to understanding how structures, culture and agency can contribute to the achievement of ESD, specifically on achieving goal 4 in higher education. In this study we argue that Giddens' structuration theory helps us to see and understand the complexity of achieving ESD in the SADC region. Our study forms part of a broader theoretical and methodological debate on the use and application of the realist theory in ESD studies. Giddens has negotiated a balance between structure and agency toward subjective and interpretivist to conceptualise the ESD implementation.

Gidden's theory as a whole has not been applied in ESD studies, but this is not to mean that this theory is unknown to ESD scholars, but it would be more accurate to say that elements of this theory have been applied. It is, therefore important to explore this theory in this entity because the theory may help us to understand and discuss the relationship of structure and agency in relation to ESD and also incooperate culture. The main building block of the theory are agency, structures and culture but with a strong focus on structure and agency where the concepts of structure and agency are mainly interested in the structures of social reality and the extent to which agency or individuals are free to act within the structure which has its own culture.

III. RESEARCH METHOD

In this study, the researchers took a qualitative research approach with an interpretive epistemological and constructivist ontological perspective. By taking this standpoint we assumed that social phenomena and the meaning of it are subject to the influence of social actors which are produced and constantly changed by social interaction (Thornburg and Chapman, 2014: Creswell, 2012, 2013).As a research methodology, qualitative research methods infuses an added advantage to the exploratory capacity that researchers need to explore and investigate their research studies. We also considered a qualitative research approach which is embedded in an interpretive paradigm as most suitable for exploring the achievement of ESD in the SADC higher education context. The interpretive paradigm enabled the researchers to see, hear and understand the particular meaning making inherent in peoples' lives within the selected higher learning institutions. Qualitative methodology allows researchers to advance and apply their interpersonal and subjectivity skills to their research exploratory processes. Our study adopted a qualitative research approach which is flexible enough and participant oriented to get to the real-life experiences of the research participants. Interpretive phenomenological analysis can afford researchers the opportunity to explore in more details the lived experiences of the research participants based on the understanding that human beings are sense making creatures and therefore the accounts which participants provide reflect their attempt to make sense of their experiences. Creswell, (2012:76) tells us that, "a phenomenological study describes the common meaning for several individuals of their lived experiences of a concept or phenomenon''. In this study we as phenomenologists focussed on describing what all participants had in common as they experience a phenomenon.

IV. DATA COLLECTION METHODS

The focus of our study lies in SADC universities, two in Zimbabwe, one in Botswana and one in Namibia. The authors are Senior Lecturers in the universities and one a Professor from a university of Finland who played a crucial role of advising and moderating all activities including the interviews and the article presentation. The desire to collect data that reflected the perspectives of the research participants resulted in the choice of in-depth eight unstructured interview questions with participants. The eight common questions were

used to solicit participants' views on the implementation of ESD across universities. Our questions were broad and open-ended to capture the breath of ESD in the institutions. Creswell (2013) argues that, in a phenomenological study the process of collecting information involves primary in-depth interviews with as many as ten individuals. The idea is to describe the meaning of the phenomenon for a small number of individuals who have experienced it. Interviews (Creswell, 2013) present the researcher the means to get hold of the experiences, knowledge, thought and feelings of participants. The bulk of our data collection was done through telephone conversations and internet. This was because of the Covit-19 pandemic which could now allow us to conduct face to face interviews. We followed Bernard's (2002) lead, the idea was to get people to open up, and let them express themselves in their own terms, and at their own pace. The study participants were asked eight broad and open-ended questions to capture the breadth of implementing ESD specifically SDG 4 on quality education in the four universities. The eight questions correspond with the theoretical view point of Danermark and Price (2018) of structure, culture and agency in enabling the achievement of (SDG) 4 in higher education. Researchers asked the following eight questions, and the high-ranking researcher from Finland ensured the questions' relevance and usefulness.

- What is the interplay of structure culture and agency in constraining the achievement of (SDG) 4 in the university?
- Why are universities in the Southern African region failing to propel the systematic transformation leading to the achievement of quality teaching and learning?
- What should be the role of stakeholders in strengthening the achievement of (SDG) 4 in higher education?
- What are the specific challenges that are faced by universities in achieving ESD?
- How does higher education management in your institution constrain the implementation of ESD?
- What institutional barriers exist in the implementation of (SDG) 4 in higher education institutions?
- What opportunities exist in higher education institutions to affectively implement ESD?
- What strategies could be suggested to enhance the achievement of (SDG) 4 in higher education institutions?

The eight questions correspond to the theoretical framework described in our literature review. Included participants in the research for this article were as follows:

Country/University	No of participants		
	Deans	Lecturers	Administration
Zimbabwe National University of Science and Technology	2	2	1
Lupane State University	2	4	1
Namibia University of Namibia	1	1	1
Botswana University of Botswana	1	3	1

As much as possible we tried to involve participants who were involved in ESD implementation who had an idea of the implementation of ESD in their university. We tried to identify participants who had an idea about the implementation of ESD concepts into core university functions and practices of teaching and researching.

Our main objective was to understand aspects of the institution that constrained the agency of the university educators in their attempt to achieve education for sustainability and particularly quality in their context of higher education.

V. PRESENTATION OF STUDY FINDINGS

According to the United Nations Educational, Scientific Development (2014) ESD is education that allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future. ESD requires participatory teaching and learning methods that motivate and empowers learners to change their behaviour and take action for sustainable development. ESD promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way (UNESCO, 2014). As ESD requires far reaching changes in the way education is delivered, UNESCO from 2005-2014 and SDGs of 2015 seek to create greater momentum worldwide to bring the collective weight of educational resources to bear on the delivery of quality education and learning that leads to a more sustainable life in future. As Agenda 2030 has gone almost a third towards implementing its goals, our study sought to establish the challenges of achieving SDG4 on quality higher education focussing on three countries in the SADC region. Our argument is structured according to the culture, structure and agency theoretical view point to offer a deeper understanding and insight into the achievement of SDG4 on quality higher education. The presentation of our findings is based on the interview questions with participants who had significantly embedded ESD in their universities and who had participated in ESD change projects initiated by UNESCO.

The interplay of structure, culture and agency in achieving SDG4 in higher education

The interview question on the interplay of culture, structure and agency in achieving SDG4 pertains to the roles that individuals play in higher education and cultural issues and structures constrain the achievement of the specific higher education targets on quality education. Our objective on this

question was to identify aspects of higher education systems that constrained the university in their attempts to achieve quality teaching. The structural domain comprises policies, organisations, institutional structures and systems together with their positional levels in the organisation. The organisational structure is the skeletal framework within which people carry out their work (Shava and Heystek, 2018). Each of the individual agents in higher education operates within a structural environment which is defined by its own rules and resources and has its own culture. Thus to understand the complex realities of social issues surrounding the achievement of SDG4 on quality higher education, it is not enough to draw on individual agency but a combination of structural, cultural and agential perspectives. The bottom line of structure, culture and agency is that the individual and society are interdependent, and thus both perspectives should ideally be crucial in establishing how they constrain the achievement of organisational goals.

Participants in this study provided evidence showing that structural, cultural and agential conditions in higher education constrain the achievement of quality teaching and learning. Collective evidence from participants highlighted the structural, cultural and agential factors as significantly constraining the achieving of SDG4. Several responses indicated that higher learning institutions in the SADC region have faced multiple challenges associated with the transition to achieve SDG4. One of the greatest challenge being the growing numbers of students and deep systematic policy changes relating to deepening and widening access to higher education. In this study, we established that the marriage between expansion in higher education and achieving SDG4 and its ten targets has not been an easy undertaking. Most participants stated that higher education expansion was necessary as it opened opportunities for many who by not their choice were deprived, but the expansion could not address socio economic objectives because of the quality of graduates.

Analysis of interview data revealed that SDG4 was difficult to achieve due to the lack of attention paid to participatory and democratic decision- making processes outside academia, which results in an inadequate framework for involving societal processes. For many participants, barriers for achieving SDG4 were summarised as:

- Lack of institutional ESD policy or strategy on ESD.
- Lack of institutionally coordinated effort that incorporated all faculties in the bid to ensure sustainability.
- Lack of awareness about ESD across disciplines.
- Lack of adequate value for the essence of ESD.
- The lack of financial and material support from top management.
- Lack of contributions from the government towards supporting ESD initiatives.
- Lack of supporting and liaising with higher education institutions for more effective implementation of ESD.
- Little attention was given to sustainability issues.
- The absence of ESD related courses in higher learning institutions.
- Lack of commitment to implement policies and strategies to enhance ESD in all universities.
- No common understanding of the concept of quality in education
- Challenges of linking ESD in programmes
- Lack of capacity to implement ESD
- Challenges brought by the COVID-19 pandemic
- Lack of coordinated institutional activities to address sustainability issues.
- The deficit of awareness hampered the emergency of individual agency directed at achieving ESD.
- Negative attitude and lack of commitment of university community towards ESD.
- Challenges relating to the traditional practice and hierarchy of senior academics, disciplinary dissemination and apportionment of ESD responsibilities and expertise in certain disciplines or faculties.
- ESD specifically considered to be for faculty of education since education appears in the concept of education for sustainable development.
- ESD left for school of education and not to be a concern for other faculties such as the natural sciences.
- Misunderstandings or misconceptions of what ESD means among senior academics.
- ESD constrained by institutional hierarchical approaches to curriculum and course development.
- Few academics have been trained and thus do not have the capacity to approve new ESD courses.
- Lack of professional training within an institutional structure and culture constituted a source of constraint for the agency of others interested in ESD implementation.

The most critical challenge of achieving SDG4 in the SADC higher education is that the concept of ESD is still not understood by academics and there is resistance to change. One of the academics commented that:

In our university if those proposing changes in our teaching and courses are not professors or senior lecturers, they are largely unsupported by senior academics and administrators. At this university very few academics have been trained and they have the capacity to approve new ESD courses which are faced with institutional resistance. Resistance comes especial on the approval of programmes and in some cases it may take years before a program is approved.

Participants from the University of Namibia remarked that: *The challenges brought by the COVID-19 have greatly affected our teaching and learning programmes. Teaching on line has not at all been effective as the majority of our students have no internet connectivity in their rural areas or even in the locations.*

All these are typical example of structural and agential barriers to achieving SDG4 within an educational structure and culture constituting a source of constraint for the agency interested in SDG4 implementation. Evidence from the interviews with academics showed that, the implementation of ESD was faced with resistance from academics. Findings showed that there was lack of consistency in terms of how ESD was implemented in different universities and in different faculties. There are no strategies to provide concrete and measurable goals that are linked towards ESD.

Propelling the systematic transformation towards quality teaching and learning.

To understand challenges facing universities in the SADC region to propel the systematic transformation towards quality teaching and learning, the historical tradition and culture of higher education needs to be understood and reviewed. Findings from the study pointed to the growing numbers of students in universities and the lack of financial resources necessary to increase system capacity to transform towards quality teaching and learning. One of the participants from the University of Namibia remarked that:

Because of their intellectual capacity and their role in knowledge generation, our universities are considered to be key actors in achieving all the seventeen Sustainable Development Goals and specifically goal4, but they need radical innovation for them to propel the systematic transformation towards achieving quality teaching and learning and not only faculty of education.

She went on to say:

To develop a holistic and consistent sustainable- oriented higher education the greening of higher education is needed. There is need for more direct influence and participation by all involved in higher education teaching and learning and ESD should be undertaken over a relatively wide area of university teaching.

Participants also identified the following as key strategies for systematic transformation in higher education:

- Professional development among academics in all academic disciplines.
- Introducing sustainability knowledge as a crucial concern in teaching and learning.
- Staff training.
- Organising workshops for lecturers on ESD re-orienting higher education curriculum to address quality and sustainability.
- Building partnerships and networks with regional and international organisations like SIDA, SANORD and SNEDESD.
- Making available high quality higher education institutions.
- Provide high quality teacher education training institutions to fulfil the transformation and transition to ESD.
- Institutional support and student life services.
- Outreach and forming partnerships both locally and globally to enhance sustainability.
- Universities to include sustainability visions and strategies in mission statements.
- Come out with visible indicators of change, active and participatory learning.
- Management to be spread across educational systems and developing synergies through ESD across communities and universities.
- There is need for sustainability leadership –oriented that should be developed which requires systematic thinking and trans- disciplinary skills on top of existing disciplinary knowledge and an understanding of the human change.
- In teacher education, research into commonly adopted ESD pedagogies is a high priority.
- Universities should play a role and contribute significantly to ESD in the development of appropriate knowledge and competencies.
- SADC and UNESCO should strengthen ESD in institution of higher learning.
- Change projects should be adopted which;
    - ✓ .respond to and potentially contribute towards relevant national and institutional policies and strategies.
    - ✓ .should be aligned to national and institutional curricula frameworks and potentially contribute towards curricula innovation.
    - ✓ .should focus on a variety of learning domains.
    - ✓ .should enhance inter-departmental engagement and communication.
    - ✓ .they should foster lifelong learning.

Throughout the interviews participants highlighted that the lack of funding was hindering the propelling towards the transformation to achieve SDG4. A senior management personnel in one of the universities remarked that:

The lack of funding, poor awareness of the concept of ESD concepts among us and potential partners and also institutional inflexibility and political administrative indifferences makes it difficult for our institution to transform towards achieving SDG4. More so there is total lack of commitment to provide funds necessary to achieve quality in higher education teaching and learning.

It emerged from our interviews with academics that, the road to greater acceptance and integration of ESD in the SADC region higher education has seen a rocky and circuitous one, and often strewn within the lack of support from government. In Botswana and Zimbabwe it emerged that despite the range of well-intentioned efforts towards implementing SDG4 and its targets through several initiatives, little success has been achieved. In Zimbabwe there is a handful of highly motivated and patient individuals who are prepared to face the task of breaking down various barriers. Zimbabwe has members of academic staff from universities and teacher training colleges who are involved in the Sustainability Starts with Teachers Project which is an action learning programme centred around a contextually defined ESD Change Project. Each participating institution is working on a particular ESD change Project, relevant to their context.

In all interviews it emerged that the achievement of SDG4 on quality higher education was constrained by methodological barriers, financial and institutional barriers among others. Effective implementation of ESD in the SADC region depends to a large extent on the prevailing political situation and political will, which for the mean time remains comparatively turbulent especial when the policy focus is on increasing the number of students in higher education, where the majority are enrolled for the humanities and arts degree programs at the expense of Science, Maths and Technology. In terms of teaching and training, ESD in all the three countries does not greatly figure out well, where they are offering it, it is offered on an optional basis at some pedagogical faculties and especially by academics who are attending UNESCO's Capacity Building Programme for Teacher Education for Sustainable Development. The Sustainability starts with the Teachers programme is implemented as a partnership between the UNESCO Regional Office for Southern Africa, the Southern Regional Universities Association (SARUA) and the Swedish International Centre of Education of Education for Sustainable Development (SWEDESD). This project is supported by the Swedish International Development Agency and countries in the SADC region through their universities and Teacher education colleges are partners towards achieving the SDGs or ESD for 2030 Global Agenda.

Mechanisms, strategies and opportunities to enhance the achievement of SDG4

The interview question on mechanisms, strategies and opportunities to enhance the achievement of SDG4 pertains to different support mechanisms, strategies and opportunities available in universities to achieve SDG4. The question also sought to understand what stakeholders are doing to support the achievement of SDG4 and its ten targets. Study participants provided strategies which are summarised as:

- Expanding higher education coverage in a sustainable and equitable way.
- Capacity building programs need to be intensified by UNESCO, SARUA, SIDA, SWEDED and SADC Education sector for university and college lecturers.
- Increasing enrolments in higher education in areas such as Science, Mathematics and Technology (STEM) courses.
- Ensuring that all learners acquire knowledge and skills to promote sustainable development through the use of ICTs.
- Integrating ESD in all degree programs and in Teacher training.
- Policy dialogues to advance ESD in higher education.
- Support capacity building for academics and where possible provide exchange programs for both academics and students.
- Ensuring inclusive and equitable quality higher education and promoting lifelong learning.
- Establish holistic and transformational learning which addresses learning content and outcomes, pedagogy and learning environment.
- Re-skilling and updating the curriculum, pedagogy and education resources to address 21st century challenges.
- Designing teaching and learning in an interactive, learner-centred which enables critical thinking, problem solving, action oriented and transformational learning.
- Empowering learners to transform themselves to enable transitions to greener economies and societies.
- Develop skills among learners for green jobs.
- Creating stimulating learning and promoting core competencies such as, critical and systematic thinking, collaborative decision making and taking responsibility for present and future generations.
- Reviewing higher education content, curriculum, teacher education and Technical Vocational Education and Training (TVET) policy in light of recent trends towards emphasis on 21st century demands.
- Demand for a new type of competencies and new knowledge as well as use of ICTs in teaching and learning.
- Higher education in SADC countries to identify relevant content and knowledge related to sustainability issues and opportunities.
- Use transformative learning methods and creating transformative learning environments.
- Planning and understanding assessments for ESD learning.
- Learners creating initiatives for green campuses and if possible initiating green university projects.
- Universities working on a new curriculum framework that will bring in new ways of teaching and learning and in cooperating ESD

All these strategies were identified as crucial for achieving SDG4 in higher education.

Specific quotes from participants.

In our universities we realise that there is poor understanding even among academics about the difference between ESD and environmental education. There is institutional confusion about trans- disciplinary education and ESD competencies.

Our universities structures remain highly inflexible and resistant to change.

Financial support is lacking and ESD transition is not easy to take place.

In Botswana, ESD exists but there is little if any within institutional levels. In all interviews there was mention of a lack of political and financial support on the part of the government and this has made little progress in achieving SDG4 in higher education.

Hi4.gher education management commitment to achieving SDG

To achieve a quick fix of the SADC higher education system, higher education management commitment is required. Management needs to make quality in higher education a core of the institutional strategic plan. There is need for integrating quality principles and ESD into higher education teaching and learning. Collectively partipants of the study highlighted that the shortage of skilled management in the SADC regional institutions has its roots in higher education. The situation is more serious with respect to weak leadership, management and governance which are rampant and further exacerbate challenges to higher education transition towards achieving SDG4. One of the study participants from Zimbabwe commented that:

Management inefficiencies are common among universities and drain resources from key fundamental objectives of increasing quality, access and sustainability. Our management is not focussed and their priorities are not in line with the university goals, they are spreading human and material resources thin.

It emerged from the interviews with academics that the inefficiencies and lack of commitment from top management lead to underutilised facilities, some duplication of positions resulting in some cases the deterioration of quality teaching and learning. Common among universities is uneconomic procurement procedures and the allocation of a large share of the funds or budget to non-educational expenditures. In one of the universities management during the time of interview had bought the best of the vehicles for management when the university did not have cars for attachment visits and also there were no printing facilities in the university. Things like bond paper, tonner, printers, markers and laptops were in critical short supply. One of the participants commented that:

Our university management is rarely trained in the management of higher education institutions, they are not skilled in strategic planning, research management, financial management, human resources management, performance management and the skill of partnership building and networking. Our senior management lack access to the global knowledge pool and the international academic environment and there is total lack of bench- marking. Our university needs funding and budgeting policies so that allocation of funds is linked to quality continuous improvement.

Findings from the study showed that while universities did not have enough funds to provide for quality teaching and learning, the situation was worsened by lack of management skills to effectively manage institutional funds. While the lack of funds constrained research capacities, across all universities, top management did not prioritise teaching and learning which is the core business of the university . One of the participants questioned the idea of top management staying in an expensive hotel for a period of five days for strategic planning instead of conducting such meetings at no expense at the university board room. Most of the universities in the SADC region have dilapidated physical facilities and infrastructure is in a poor state but management does not make effort to maintain the infrastructure. In some cases, management may place ESD near the top of the institutional agenda, but may fall victim of the political jockeying that results in making changes to senior management positions and the institutional knowledge required to maintain momentum for ESD is lost through the cleansing of staff that accompanies the instalment of new members who come with a complete new vision and new strategy. In one of the universities ESD topics have been incorporated into relevant subjects and specific subjects devoted to ESD and there was an initiative to adopt a holistic approach to the inclusion of social and economic dimensions, but the appointment of a new Deputy Vice Chancellor academic resulted in a different approach and the suspension of ESD efforts.

Role of stakeholders in strengthening the achievement of SDG4 in the SADC region.

The UN Sustainable Development Goal 4.7 proposes the integration of ESD into all levels of education with an emphasis on higher education through building capacities of educators and trainers to facilitate the implementation of ESD into education policy, curricula, theory and practice. Participants identified the following key activities by stake holders for strengthening the achievement of SDG4 in the SADC region:

- Capacity building for academics on ESD.
- Establishing research partnerships and collaborations with UNESCO.
- UNESCO providing staff development programmes.
- Providing high quality infrastructure in universities for ICT .

- Reinforcing quality teaching and learning professional networks in Africa and developing countries.
- Governments making quality higher education a core of the institutional plans.
- Government making adequate investment for infrastructure development.
- Government providing strong and accessible systems of higher education and training.
- Providing adequate funding for ICT infrastructure development.
- Ministries of education providing funds to improve infrastructure in higher education.
- Academic and student exchange programs with developed countries such as Sweden, Finland and Norway.
- UN organising conferences on ESD.
- UNESCO's world conference on ESD held in Bonn in 2009.
- UNESCO is tasked as the lead agency for the promotion of ESD.
- UNESCO mobilising education resources to transform higher education.
- UN Member States launching various policy initiatives or frameworks in response to ESD.
- UN and UNESCO establishing national and interdepartmental bodies to coordinate ESD policies and implementation.
- UN creating new ESD policies or including ESD in existing education policies.
- UNESCO developing tools and instructional materials related to ESD,
- Governments and UNESCO allocating specific budgets to ESD actions and activities.
- Coordinating mechanisms and higher education based networks by governments.
- Scaling up ESD pilot programs in universities.
- Governments influencing policy implementation on ESD.
- Broad based reform efforts by governments.
- Governments initiating whole university approaches to ESD.
- Governments monitoring and evaluating ESD initiative in higher education.
- Governments coming up with policies that aims at integrating ESD in higher education.
- Tools to measure ESD progress initiated by governments and ministries of education.
- SANORD or UNESCO organising conferences in the SADC region on education for sustainable development.
- Mobilising strong national and international political commitment for the achievement of SDG4 on quality higher education.
- Introducing learners' values and norms relating to the culture of quality teaching and learning.
- Building partnerships and networking with other relevant stakeholders, this means creating cooperation between a wide range of stakeholders.
- Most governments emphasising the importance of agriculture and food security.
- Ministries transforming ESD beyond the education sector and involving links to different development priorities and initiatives.
- Many regional and national authorities making commitments towards ESD.
- DESD viewed as part of the New Partnership for Africa's Development (NEPAD).
- DESD has a great influence in educational reform and development.
- Some governments establishing education hubs and ESD experimental centres at universities e.g. Zimbabwe.
- Ministries of higher education establishing ESD structures in universities to help them uplift education quality and innovation education Hubs.
- Coordination between ministry of education and universities on ESD.
- Support from international donors, NGOs and the private sector to enhance implementation of ESD policies.

There was considerable evidence from interviews that government, NGOs and UNESCO in particular, although constrained by budgets were playing a significant role that was more likely to strengthen the achievement of SDG4 in higher education. There is evidence from the interviews that governments play a role in improving quality higher education through ESD policy initiatives. A take away from our interview discussions was that stakeholders especial governments' strong policies and initiatives in higher education strengthened the achievement of SDG4 along a more holistic pathway. In Zimbabwe and Botswana there is evidence of widespread introduction of systematic monitoring and assessment of the implementation of ESD.

VI. CONCLUSIONS AND RECOMMENDATIONS

Our article has used the critical realist theory of structure, culture and agency to structure an analysis of the challenges of achieving SDG4 in higher education in the SADC higher education context. The data for the analysis was obtained from multiple cases of four universities in the SADC region. The overarching aim of SDG4 is to create a world where all students regardless of background and location can benefit from quality education and learn the values, behaviours and lifestyles associated with creating a sustainable future and promoting societal transformation. By drawing on this expanding pool of interrelated knowledge, students develop attitudinal and behavioural changes in their learning experiences and create conditions for more sustainable lifestyles. SDG4 of the Sustainable Development Goals;

"ensure inclusive and equitable quality education and promote lifelong learning for all". It addresses Target 4.7 of SDG4 directly, which requires all governments to;

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promoting a culture of peace and nonviolence, global citizenship and appreciation of cultural diversity and culture's contribution to sustainable development (WEF,2016)t.

ESD empowers learners to take informed decision and responsible action through designing teaching and learning in an interactive, learner centred way that enables exploratory, critical thinking, action-oriented and transformative learning. Learning outcomes are stimulating, promoting competencies, such as critical and systematic thinking, collaborative decision making and taking responsibility for present and future generations. While the SADC region individual higher education institutions, there has been efforts to introduce ESD in teaching and learning, the growing numbers of students ,lack of financial support to increase system capacity and the absence of ESD strategy in institutions and other systematic challenges which occur within higher education has hindered the achievement of SDG4 on quality in education. These challenges, especial the growth in the number of students contribute to the financial crisis and also the economic meltdown. Many of these structural, agential and cultural challenges in higher education were similar across the region, but differences only existed in the institutional frameworks which emerged due to the diverse transformation process. The lack of trans-disciplinary study programs or other opportunities for quality teaching and learning and non-existence of networking, collaboration, exchange programs, academic visits and university outreach and dialogue with social actors or potential stakeholders and other related traditional prejudices have thus acted as major obstacles to pressing and transitional trends towards achieving SDG4 in the SADC region higher education. A rosier outlook could be seen only in those institutions where management and government budget and investments in higher education have been relatively high. Specific challenges that faced higher education institutions were related to:

- Lack of policy towards ESD.
- Lack of top management commitment and poor coordination mechanisms.
- Resistance to change among senior academics.
- Lack of academic knowledge about ESD and failure of structuring of learning experiences around ESD.
- Rigid approaches to integrating ESD contents in the curriculum.
- Lack of motivation, commitment and support of stakeholders and institutional management.

In reality institutional systems follow rigid approaches to intergrading ESD contents in curriculum and pedagogy.

In such contexts the smooth transition and implementation of ESD into classroom teaching and student learning is undermined. In all universities covered by the study, support mechanisms necessary for achieving SDG4 and in particular ESD are often weak or missing. Together with institutional administrative structures that are immune to innovation, also the political support that is rarely forthcoming and hence the finance required to setup new trans-disciplinary arrangements is lacking. ESD not only aims at empowering students to learn about the world, but to be actively involved in their communities and their teaching and learning activities. Our study conducted in Botswana, Namibia and Zimbabwe higher education institutions highlighted the major challenges of implementing SDG4 in selected universities.

VII. RECOMMENDATIONS.

Having analysed the challenges of achieving SDG4 in higher education, it is recommended that:

- Funding, specifically the lack of funding has been an overriding issue, all the more so in this era of economic downswings and budgetary cut backs. A multi-pronged search for new funding sources is needed and more likely to work for the SADC higher education institutions.
- If higher education is to engender a more systematic up-take of ESD in institutions of higher learning, then policies should be put in place and contextualised and nuanced. Advocates must continue to find ways to encourage multiple stakeholder participation to advance different models of ESD implementation in higher education.
- If the SADC higher education is to achieve SDG4, there is need to improve the basic unit of the higher education institutions that encompass the human (agency) and material (structures) equipment which collectively improve student's learning and institutional culture.
- SADC higher education institutions should update their curriculum, pedagogy and more important their educational resources including ICT infrastructure to address the 21st century context of teaching and learning. There is need to address issues relating to how learning takes place, what knowledge and information students acquire, what skills are needed to succeed and how we expand gains for progressive and sustainable learning outcomes among learners.
- There is need to motivate and enrich existing forms of agency in ways that expand people's learning, participation and contribute to creating a good life through quality teaching considering investing in infrastructure development.
- There is need for policy framework and strategy on ESD that addresses ESD issues relating to educational content, learning processes and incorporating into higher education principles relating to quality teaching and learning.

- Initiatives in higher education should simultaneously acknowledge broad ESD themes and holistic conceptions, while keeping focused on particularities of each institutional context and communities.
- Globalization for resource related partnership for higher education is both an opportunity and a challenge but it should be sharpened and managed so as to ensure the achievement of SDG4 and sustainability in higher education.
- International agencies, private foundations and national governments should cooperate in the compilation and evaluation of ESD in education in Africa, they should develop appropriate quantitative and qualitative indicators, measures and data to assist in developing strategies for enhancing the achievement of SDG4.
- SDG4 achievement requires capacities among policy makers, curriculum developers, education institutional leadership, assessment expects and most specifically academics to take a leading role.
- Many countries not only in Africa but the entire world point to limited funding and resources as major barriers to achieve SDG4 and for capacity building, that being the case support from international donors, NGOs and the private sector is needed to successfully achieve SDG4.
- There is need to enhance and empower higher education institutions in the SADC region to contribute more effectively to the achievement of SDG4 and for the achievement of development and transformation.
- Higher education the world over is the major contributor to development and long term holistic partnership with the developed countries will bring about positive results with quality and sustainability, this will have a reasonable impact on the transformation agenda of the 21st century.

Finally, given the many ESD models and approaches existing on the ground in higher education new mechanisms and networks need to be developed to establish knowledge banks that empower local academics in ESD facilitators and trainers. The scaling up of ESD in higher education given its particular diversity and lack of standardization requires sharing experiences on new dissemination platforms. Especially important in this regard are instances where ESD is not simply an add-on activity, but rather part of a whole institutional or whole system approach to ESD.

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